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Study on Environmental Fiscal Reform Potential in 12 EU Member States

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Final Report to DG Environment of the European Commission

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EXECUTIVE SUMMARY

E.1.0 Introduction

The European Semester process provides an opportunity to ensure that macroeconomic policies are sustainable, not only economically and socially, but also environmentally.[1] In the 2014 European Semester, the Annual Growth Survey (AGS) was adopted on 13 November 2013 (15803/13), and the priorities identified therein should be addressed in the National Reform Programmes (NRPs) which are due by the end of April 2014. The priorities identified by the AGS include the following:

- Tax should be designed to be more growth-friendly, for instance by shifting the tax burden away from labour on to tax bases linked to consumption, property, and combatting pollution.
- Increasing resource efficiency and reducing the EU's dependence on external energy sources must be part of the EU's growth strategy.
- Promoting resource efficiency by improving waste and water management, recycling and energy efficiency.[2]

The AGS also underlines the need to reduce environmentally harmful subsidies and to exploit the employment generating potential of the green economy.

The references to more growth friendly tax systems, and the expressed desire to promote more efficient use of both energy and other resources, point towards the centrality of environmental fiscal reform (EFR) as a means to set the European economy on a trajectory of growth with a strong shade of green. The approach fits well with the AGS view that "*recovery in Europe does not mean getting back to 'business-as-usual'*".

E.2.0 Aims

This study, undertaken by Eunomia Research & Consulting in conjunction with Professor Mikael Skou Andersen of Aarhus University, has, as its central aim, to:

> *"provide empirical data or secondary sources on the potential economic and social benefits of environmental fiscal reform, to support the input in the European Semester process on environmental protection and resource efficiency".*

The specification elaborates on this as follows:

> *The task includes presenting data on the potential of revenues from environmental taxation and other indirect benefits (such as job creation) resulting from*

[1] See for more on this: http://ec.europa.eu/environment/integration/green_semester/index_en.htm

[2] The Commission Communication "For a European Industrial Renaissance" adopted on 22 January 2014 also recognises that, among different priorities, action should be taken to increase energy and resource efficiency to support the competitiveness of the European industry.

environmental fiscal reform in 12 selected countries, using the methodology the EEA has applied, with methodological assistance of EEA

Of the 12 countries selected, 8 received country specific recommendations in the 2013 European Semester related to EFR (Belgium, Czech Republic, Estonia, France, Hungary, Italy, Lithuania, Romania), 2 had received such a recommendation in 2012 (Austria and Slovakia), Croatia was considered as new Member State and Poland was also included.

The approach taken in this study was to highlight the potential for revenue generation using environmental taxes. The intention was to indicate where this potential may lie, and to demonstrate the magnitude of the revenues that could be derived from the taxes.

E.3.0 Approach

The study proceeded with a desk-review of the existing situation based on the use of existing databases and information. The sources used for reviewing existing taxes included:

- The European Commission's DG TAXUD database;[3]
- DG TAXUD Excise Duties Tables (energy products and electricity);[4]
- The OECD/EEA's database on environmental taxes and charges.[5]

For the environmentally harmful subsidies, the following were used:

1) The OECD report 'Inventory of Estimated Budgetary Support and Tax Expenditures';[6]
2) A further report on budgetary support and tax expenditures for fossil fuels for six non-OECD EU countries;[7]
3) Calculations based upon subsidy descriptions in the DG TAXUD energy excise duty tables for 2013;[8]
4) An IEEP report for the European Commission on Member States' achievements in selected environmental policy areas;[9]

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[3] European Commission (2013) *Taxes in Europe Database*, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[4] European Commission - Taxation and Customs Union (2013) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2013, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[5] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, www2.oecd.org/ecoinst/queries/index.htm

[6] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, dx.doi.org/10.1787/9789264187610-en

[7] IVM Institute for Environmental Studies (2013) *Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries*, Final Report, 15 January 2013, http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

[8] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity)*, Situation as at 1 July 2013, *http://ec.europa.eu/taxation_customs/index_en.htm#*

[9] Institute for European Environmental Policy, Ecologic Institute, BIO IS, Institute for Environmental Studies (2013) *Member States' Achievements in Selected Environmental Policy Areas*, Final Report for the European Commission

5) A report by Copenhagen Economics for the European Commission on company car taxation.[10]

Section 3.0 of the Main Report provides some commentary on the key issues that were faced.

At the same time, recognising the desirability of a sound basis for making suggestions for EFR, a review of 'good practice' was undertaken. The review was undertaken with a view principally to the potential for revenue generation through EFR. The term suggestions is made rather than firm recommendations since the intention is to demonstrate potential for revenue take. The details can be found at Appendix A.1.0 of the Main Report.

For each country, suggestions were then made for changes to existing / new taxes and removal of EHS. Initial country reports were prepared before being sent for review by one of a number of country experts, whose assistance we gratefully acknowledge. The reports were then amended to reflect these comments.

The modelling of revenues was based on projections of the tax base (e.g. energy consumed) in the absence of any change, and changes to those projections as a result of the suggested change in tax rate. This modelling is not sophisticated, but designed to impose some realism into the modelling. The estimates of revenue generation were made on the basis of the revised projection. The changes in the tax base between the 'with' and 'without' tax projections were used to make estimations of the environmental impact of the changes.

It should be noted that the revenue projections are not based on macroeconomic modelling, and interactions between the measures are not explicitly modelled. In essence, the revenue figures assume each tax is implemented independently of the others. In reality, one would expect some interaction between, for example, taxes on abstraction and taxes on discharges to waste water, and taxes on transport fuels and taxes on vehicles (where these are designed to increase the fuel efficiency of the stock of vehicles in use).

E.4.0 Key Findings

All figures are given in real (2013) terms. For the group as a whole, additional revenue generated in 2016 is estimated to be around €35 billion, or 0.63% of the estimated GDP for the 12 countries combined, rising to €101 billion in 2025 (in real 2013 terms), or 1.57% of the combined GDP. In addition, in 2016, around €24 billion in real 2013 terms, or 0.43% of the combined GDP, could be saved by removing some environmentally harmful subsidies (there was no forward projection of savings for the subsidies).

Table E-1, Table E-2 and Table E-3 below show the split of revenue generation by the different types of environmental taxes which are suggested to be implemented in the 12 Member States. The majority of the overall increase comes from additional taxes on transport (excl. transport fuels) (0.84% of GDP). Additional revenue generated from increasing energy excise

[10] Copenhagen Economics (2009) *Taxation Papers: Company Car Taxation*, Report for European Commission, November 2009, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf

duties amounts to 0.44% of GDP. Finally, an increase of 0.28% of GDP is estimated from increased taxes on pollution and resources.

Table E-1: Revenue Generated from Energy Taxes by the 12 Member States in 2025, % GDP and € billion (real 2013 terms)

	% GDP	€, billion
Energy Excise Duties - Transport fuels	0.26%	16.74
Energy Excise Duties - C&I / Heating	0.11%	7.10
Energy Excise Duties - Electricity	0.07%	4.40
Total Energy Taxes	**0.44%**	**28**

Table E-2: Revenue Generated from Transport (excl. transport fuels) Taxes by the 12 Member States in 2025, % GDP and € billion (real 2013 terms)

	% GDP	€, billion
Vehicle Taxes	0.66%	42.35
Passenger Aviation Tax	0.18%	11.80
Freight Aviation Tax	0.00005%	0.003
Total Transport (excl. transport fuels) Taxes	**0.84%**	**54**

Table E-3: Revenue Generated from Pollution and Resource Taxes by the 12 Member States in 2025, % GDP and € billion (real 2013 terms)

	% GDP	€, billion
Landfill Tax - Non-haz (excl. C&D)	0.03%	1.91
Landfill Tax - Inerts (C&D)	0.0005%	0.03
Incineration /MBT Tax	0.01%	0.41
Air Pollution Tax	0.03%	1.69
Water Abstraction Tax	0.11%	6.98
Waste Water Tax	0.01%	0.91
Pesticides Tax	0.03%	1.94
Aggregates Tax	0.05%	3.01
Packaging Tax	0.02%	1.07
Single Use Bag Tax	0.01%	0.34
Fertiliser Tax	0.00001%	0.001
Total Pollution and Resource Taxes	**0.28%**	**18**

Revenue generated by the 12 Member States from increasing environmental taxes or removing environmentally harmful subsidies is given in Table E-4. The size of the economies in the different countries clearly influences the amount of revenue estimated to be generated.

Table E-4: Revenue Generation by Member State for Selected Years, € billion (real 2013 terms)

	2016		2020		2025	
	Env. Taxes	EHSs	Env. Taxes	EHSs	Env. Taxes	EHSs
Austria	1.3	0.8	3.4	0.8	3.9	0.8
Belgium	2.2	7.0	6.1	7.0	6.9	7.0
Czech Republic	1.2	0.6	2.1	0.6	2.4	0.6
Estonia	0.2	0.1	0.4	0.1	0.5	0.1
France	12.1	4.8	38.4	4.8	42.9	4.8
Croatia	0.3	0.1	0.6	0.1	0.7	0.1
Hungary	0.7	1.7	2.2	1.7	2.8	1.7
Italy	10.3	7.6	22.1	7.6	25.5	7.6
Lithuania	0.3	0.0	0.6	0.0	0.7	0.0
Poland	3.7	0.3	6.9	0.3	7.8	0.3
Romania	2.0	0.2	4.1	0.2	4.7	0.2
Slovakia	0.5	0.4	1.5	0.4	1.8	0.4
Total	**35**	**24**	**88**	**24**	**101**	**24**

Expressed as a proportion of GDP, the revenues are shown in Table E-5. In the year 2025, the estimated additional revenue generation from the environmental taxes lies between 1.01% of GDP (Austria) and 2.51% GDP (Romania). The estimated increases for the other 10 countries considered all lie within the range 1.26% GDP to 2.21% GDP.

The environmental benefits associated with these changes have been estimated, though this analysis does not capture all the external benefits associated with the changes. Table E-6 indicates that these benefits lie between 0.03% GDP (France) and 0.55% GDP (Poland) in 2025. The patterns of the benefits reflect the sources of the additional tax revenue.

Table E-5: Revenues Generated from Environmental Taxes by Member State, % GDP

	Total Env. Taxes in 2012, % GDP	Total Additional from Env. Taxes in 2025, % GDP
Austria	2.44%	1.01%
Belgium	2.16%	1.51%
Czech Republic	2.35%	1.26%
Estonia	2.78%	1.63%
France	1.83%	1.71%
Croatia	3.17%	1.37%
Hungary	2.50%	2.21%
Italy	3.02%	1.43%
Lithuania	1.66%	1.36%
Poland	2.52%	1.43%
Romania	1.94%	2.51%
Slovakia	1.75%	1.82%
EU-average	2.29%	
EU-Maximum	3.87%	

Table E-6: Estimated Indirect Benefits from Reduced Environmental Impacts, 2025, % GDP and € millions (real 2013 terms)

	% GDP	€, million
Austria	0.12%	436
Belgium	0.11%	474
Czech Republic	0.07%	112
Estonia	0.48%	110
France	0.03%	643
Croatia	0.32%	153
Hungary	0.11%	117
Italy	0.06%	966
Lithuania	0.19%	78
Poland	0.55%	2,487
Romania	0.40%	661
Slovakia	0.27%	226

E.5.0 Jobs

In respect of job creation, a detailed analysis of this is beyond the scope of this study, but a review of the potential effect of EFR on employment has been undertaken (and this can be found at Appendix A.4.0). This indicates that on balance, the impacts are positive for employment, especially where environmental taxes effectively replace taxes such as those on employment. This is an explicit objective in many cases of EFR (where revenue from environmental taxes is matched by reductions in other taxes of the same magnitude), but it may be implicit in some circumstances where there is a need for fiscal consolidation (i.e. where the choice is between raising revenue from different tax bases).

E.6.0 Administrative costs

Some concerns have been raised in the countries covered by this study regarding the administrative costs of some existing environmental taxes. A brief review indicates that many such taxes have relatively low administrative costs (compared with other taxes). This may be related, in part, to the nature of some such taxes (for example, where they are oriented around market transactions, as with taxes on energy carriers). Not all such taxes are of this nature. It is suggested that where possible, Member States should make use of the existing administrative apparatus to collect revenues so as minimise administrative costs. This might include making use of existing reporting or monitoring obligations. It might be considered also that where these do not exist, the fact that taxes can help to drive the provision, and capture of, data has some value in itself beyond that of the revenue generated by the tax.

Contents

1.0 Introduction

Eunomia Research & Consulting and Aarhus University are pleased to present this final report for the study *Environmental Fiscal Reform Potential in 12 EU Member States* to DG Environment of the European Commission. This report is a follow-on to four pilot studies on Environmental Fiscal Reform (EFR) carried out by the European Environment Agency on countries affected by the current (post 2008) economic crisis. The illustrative potential for EFR was outlined in the pilot studies and herewith applied to other Member States. According to the Specification the purpose of this study is to:

> *"… provide empirical data or secondary sources on the potential economic and social benefits of environmental fiscal reform, to support the input in the European Semester process on environmental protection and resource efficiency".*

This work covers the following 12 Member States:

- Austria;
- Belgium;
- Croatia;
- Czech Republic;
- Estonia;
- France;
- Hungary;
- Italy;
- Lithuania;
- Poland;
- Romania; and
- Slovakia.

In line with the Specification, the work has been carried out in close alignment with the abovementioned studies conducted by the EEA from 2010 to 2013.[11] The study covers all forms of environmental fiscal instruments within each country, including environmental harmful subsidies. The approach taken in this study was to highlight the potential for revenue generation using environmental taxes. The intention was to

[11] See Mikael Skou Andersen, Stefan Speck, David Gee and Jock Martin (2010) Further Environmental Tax Reform – Illustrative Potential in Ireland Prepared for the Environmental Tax Reform Workshop Dublin October 28 and 29, 2010, hosted by Comhar Sustainable Development Council, and organised with University College Dublin Earth Sciences Institute, Smart Taxes and Feasta. *EEA Staff Position Note (October 2010) SPN10/01;* Mikael Skou Andersen, Stefan Speck and Orsola Mautone (2011) Environmental Fiscal Reform – Illustrative Potential in Italy, Prepared for the Conference 'Environmentally-related Taxation and Fiscal Reform, Rome, December 5th 2011, hosted by Ministry of Economy and Finance, *EEA Staff Position Note (December 2011) SPN11/01;* Stefan Speck and Mikael Skou Andersen (2012) Environmental Fiscal Reform – Illustrative Potential in Spain, Prepared for the Seminar on Environmental Fiscal Reform, Madrid, September 13th 2012, hosted by Ministerio de Agricultura, Alimentación y Medio Ambiente. *EEA Staff Position Note (September 2012) SPN12/01;* and Mikael Skou Andersen, Stefan Speck and David Gee (2013) Environmental Tax Reform – Illustrative Potential in Portugal Prepared for the Conference 'Green Taxation: A Contribution to Sustainability, Lisbon, April 30th 2013, hosted by Ministry of Fiscal Affairs and Ministry of Environment. *EEA Staff Position Note (April 2013) SPN13/01.*

indicate where this potential may lie, and to demonstrate the magnitude of the revenues that could be derived from the taxes.

This report is structured in the following way:

Main Report

- **Section 2.0** 'Environmental Fiscal Reform in Context' provides the context for the study in terms of how environmental fiscal reform is framed, the overarching European Semester Process and some key benefits (in terms of jobs);
- **Section 3.0** 'Key Issues' addresses some key issues of note to set the context for the remainder of the analysis;
- **Section 4.0** 'Good Practice' outlines the benchmarks by which fiscal reform is applied across the 12 Member States which are the focus of this study;
- **Section 5.0** 'Estimating Revenues and Indirect Benefits' briefly describes the approach to calculating the overall revenue potential and environmental benefits presented in the subsequent country sections;
- **Sections 6.0** to **17.0** include the country reports on EFR for the 12 Member States covered in this study;
- **Section 18.0** then summarises some of the key data for the 12 Member States.

Appendices

- A number of appendices are then given with detail on the following areas:
  - Good Practice;
  - Estimating Revenues;
  - Indirect Benefits;
  - Employment;
  - More detail on Taxes, Charges and Model Outputs for each Member State.

This document is, as far as we are aware, correct as of the time of drafting, which began in late 2013. Taxes and charges are changing all the time, as are the approaches adopted to the phasing out (and in) of subsidies and exemptions. Every attempt has been made, in the time available, to be current in the information provided. It is, however, in the nature of the subject that matters will evolve over time, rendering some of the material, in due course, out of date. For excise duties on energy (including transport fuels), data was taken from a European Commission publication showing the situation as at 1st July 2013, unless more recent data was obtained through our investigations, or proposed by in-country reviewers. Tax rates are regularly being revised, often at the start of a given calendar year.

2.0 Environmental Fiscal Reform in Context

Even before the financial downturn in 2008 there was significant interest in environmental tax policies which can promote sustainable economic growth and increase employment.[12] The protracted economic recovery has further stimulated interest in environmental tax reform which has now become a core objective of the European Commission. The Roadmap to a Resource Efficient Europe, for example, includes the following objective:[13]

> *"By 2020 a major shift from taxation of labour towards environmental taxation, including through regular adjustments in real rates, will lead to a substantial increase in the share of environmental taxes in public revenues, in line with the best practice of Member States"*.

Since the Roadmap's publication in 2011 a number of reports have been issued by the Commission focusing on the need for environmental fiscal reform as means of promoting sustainable growth.[14]

Prior to Rio+20 in June 2012, the Director of the International Monetary Fund (IMF), Christine Lagarde, called for a greening of the economy, as a key element in defining a new economic trajectory – one which was focused on job creation and sustainable economic development. She stressed how one important element in a green market economy is to ensure that prices better reflect the full environmental and social costs of goods and services:

> *"Getting the prices right, means using fiscal policy to make sure, that the harm we do is reflected in the prices we pay".*[15]

This line of reasoning echoes statements from institutions of the European Union, including from Heads of State in the European Council. Prior to Rio+20 the European

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[12] See for example: European Commission (2007) *Green Paper on Market-Based Instruments for Environmentally and Related Policy Purposes*, COM(2007) 140 final, http://ec.europa.eu/environment/enveco/green_paper.htm; European Environment Agency (2005) Market-Based Instruments for Environmental Policy in Europe, www.eea.europa.eu/publications/technical_report_2005_8

[13] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm, p. 11.

[14] See for example: European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf; European Commission (2012) *Tax Reforms in EU Member States 2012: Tax Policy Challenges for Economic Growth and Fiscal Sustainability* ; and European Commission (2011) *Taxation Papers – Quality of Taxation and the Crisis: Tax Shifts from a Growth Perspective*, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_29_en.pdf

[15] International Monetary Fund (2012) *Back to Rio—the Road to a Sustainable Economic Future*, Speech by Christine Lagarde, 12th June 2012, Accessed 3rd February 2014, https://www.imf.org/external/np/speeches/2012/061212.htm .

Council stated that *"promoting a more resource-efficient, greener and more competitive economy is crucial"*,[16] whilst also acknowledging the link between fiscal policies and a green economy:

> *"Tax policy can contribute to fiscal consolidation and growth. In line with the Council conclusions of 21 February, and recognising Member States' competences in this area, the European Council invites Member States, where appropriate, to review their tax systems with the aim of making them more effective and efficient, removing unjustified exemptions, broadening the tax base, shifting taxes away from labor, improving the efficiency of tax collection and tackling tax evasion"*[17].

EU Member States are well aware of the needs to develop a broader and sounder tax base, so as to meet the requirements for budgets which, in the longer term, are both balanced and sustainable. It is in the context of shifts in the tax burden from labour to environmental taxes and the removal of unjustified exemptions, that the notion of 'environmental fiscal reform' (EFR), also known as 'environmental tax reform' (ETR), comes into its own. As pointed out in a recent IMF staff paper:[18]

> *"Several factors point to continued momentum for environmental tax reform. One is pressure for new revenues to strengthen fiscal positions. Another is growing acceptance among policymakers that emissions pricing instruments are far more effective at exploiting the entire range of emissions reduction opportunities than are regulatory approaches. Swapping environmental taxes (that apply to traded goods) for labor taxes might also be means to improve competitiveness. And environmental problems are of growing concern, from rising greenhouse gas (GHG) concentrations to deteriorating urban air quality in industrializing nations to increasing congestion (a related externality) of transportation systems.*

The EU's 2020 targets aim to create new economic activity and employment opportunities. In looking for appropriate policy instruments for these purposes the Commission DG for Employment, Social Affairs and Inclusion have noted that fiscal measures related to the environment provide an important tool that deserves careful consideration:

> *"It should be noted that the average contribution of environmental taxes in the EU amounts to 6.3% of the overall tax bill. If all Member States were to raise this figure to 10% the result would yield an additional tax revenue equivalent to around 1.4% of EU GDP that could be used to reduce budget deficits or labour taxes. Studies show that the positive impacts in terms of job creation of the green policies would outweigh the shortcomings. For example, the increased*

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[16] European Council (2012) European Council – Conclusions, Brussels, 1st to 2nd MARCH 2012, http://europa.eu/rapid/press-release_DOC-12-4_en.doc, p. 7

[17] *Ibid*, p 4.

[18] *D Heine et al (2012) Environmental Tax Reform: Principles from Theory and Practice to Date, IMF Working Paper WP/12/180,* www.imf.org/external/pubs/ft/wp/2012/wp12180.pdf, p. 4

investments in energy efficiency would stimulate job creation in the construction and manufacturing of construction materials and sectors and would have limited impact on the reduction in jobs in the fossil fuels mining sectors".[19]

2.1 The European Semester Process

The study takes place in the context of the European Semester process, which is an opportunity to ensure that macroeconomic policies are sustainable, not only economically and socially, but also environmentally.[20] Furthermore, in order to secure the jobs and growth benefits of resource-efficiency in the transition to a low-carbon economy, EU and national policies need to fully exploit the growth potential of the green and low-carbon economy.

The 2014 European Semester round began with the adoption of the Annual Growth Survey (AGS) on 13 November 2013 (15803/13). The AGS contains priorities which should be addressed in the National Reform Programmes (NRPs) which are due by the end of April 2014. Subsequently, the Commission will propose a series of Country Specific Recommendations (CSRs) accompanied by an analysis in the form of Commission Staff Working Documents (SWDs) for each Member State.[21] It is intended that this study should feed into the development of CSRs.

This year's AGS acknowledges that "recovery in Europe does not mean getting back to 'business-as-usual'" and has identified, among others, the following priorities:

- Longer term investment in education, research, innovation, energy and climate action should be protected and the needs of the most vulnerable in our society should be catered for.
- Tax should be designed to be more growth-friendly, for instance by shifting the tax burden away from labour on to tax bases linked to consumption, property, and combatting pollution.
- Increasing resource efficiency and reducing the EU's dependence on external energy sources must be part of the EU's growth strategy.
- Promoting resource efficiency by improving waste and water management, recycling and energy efficiency.[22]

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[19] European Commission (2012) *Exploiting the Employment Potential for Green Growth,* SWD. *Accompanying the Communication on 'Towards a Job-Rich Recovery, http://ec.europa.eu/social/main.jsp?catId=89&langId=en&newsId=1270&moreDocuments=yes&tableName=news*, p. 6

[20] See for more on this: http://ec.europa.eu/environment/integration/green_semester/index_en.htm

[21] The 'Programme countries' (Cyprus, Greece, Portugal) follow a slightly different procedure.

[22] The Commission Communication "For a European Industrial Renaissance" adopted on 22 January 2014 also recognises that, among different priorities, action should be taken to increase energy and resource efficiency to support the competitiveness of the European industry.

The AGS also underlines the need to reduce environmentally harmful subsidies and to exploit the employment generating potential of the green economy. The role of EFR, therefore, has a central role to play in ensuring the priorities identified by the AGS can be met.

2.2 Environmental Fiscal Reform and Employment

In 1991 Pearce suggested that environmental taxation could lead to a *'double dividend'* as well structured schemes could help to curb harmful environmental activities and at the same time boost employment opportunities.[23] Employment can be increased either directly through private actors responding to the tax by finding innovative ways to reduce their tax burden (and therefore pollution), or indirectly, as a result of government using Government using the revenue raised by the environmental tax to reduce taxes on labour.[24] Although it is widely accepted that EFR can help to stimulate employment, the degree to which this occurs is very much dependent on the specifics of the environmental tax being considered, how the revenues are to be used, and the employment/economic dynamics within a country (e.g. the size of the informal sector, extent of unemployment, and the flexibility of different elements of the labour force).

Over the last few decades a growing body of literature has emerged which has looked at the relationship between EFR and employment.[25] Although a substantial amount of work has been done, much of this is based on theoretical modelling as opposed to the gathering of empirical evidence (perhaps unsurprisingly, given the difficulties of gathering empirical data and assigning cause and effect to a particular policy intervention in such a complex setting). Nevertheless, the findings of detailed

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[23] Pearce, D. (1991) The Role of Carbon Taxes in Adjusting to Global Warming, *Economic Journal*, Vol. 101, pp. 938-948.

[24] European Environment Agency (2012) *Environmental Tax Reform in Europe: Opportunities for Eco-innovation*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-opportunities

[25] See for example: European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf; European Environment Agency (2012) *Environmental Tax Reform in Europe: Implications for Income Distribution*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-in-europe; Anger, N., Böhringer, C., and Löschel, A. (2010) Paying the Piper and Calling the Tune?: A Meta-Regression Analysis of the Double-Dividend Hypothesis, *Special Section: Ecosystem Services Valuation in China*, Vol.69, No.7, pp.1495–1502; European Commission (2011) Impact Assessment on the Proposal for a Council Directive Amending Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity, http://ec.europa.eu/taxation_customs/resources/documents/taxation/sec_2011_409_impact_assessment_part1_en.pdf; Vivid Economics (2012) *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, Report for the European Climate Foundation and Green Budget Europe, May 2012; Jacobs, M., Ward, J., Smale, R., Krahé, M. and Bassi, S. (2012) *Less Pain, More Gain: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, November 2012, Report for Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change & the Environment, http://www.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PP-carbon-pricing-europe-fiscal-deficits.pdf

modelling work appear to be relatively consistent and suggest that gains in employment may be achieved under certain circumstances (typically, when revenues derived from the taxes are used to offset social security taxes). It should be noted, however, that some studies have suggested that unemployment may rise as a result of environmental tax reform, but these are certainly more limited than those which suggest net positive gains in employment.[26]

Employment generation appears to be most well documented in relation to energy and carbon taxes as opposed to other forms of environmental taxes such as resource taxes, or taxes on pollution. Given that the underlying principle - of shifting taxes away from employment and onto pollution and resource use – remains the same, however, there are reasons to believe that a positive outcome would result from their application in these areas also. This seems especially likely in some sectors, such as waste management, where improved management of resources tends to increase demand for labour.

A more detailed review can be found in Appendix A.4.0.

2.2.1 EFR and the Counterfactual

As noted above, EFR is frequently discussed as a means of bringing about a so called 'tax shift' in which a progressive increase in the revenues generated through environmental taxes provides a rationale for reducing taxes derived from other sources, such as income, profits and employment, the taxation of which is less desirable. The rationale for using an increase in revenues from environmental taxes in this manner is entirely sound where the fiscal position in the country concerned is relatively healthy.

However, where budgets are out of balance, and in particular, where deficits are leading to increasing indebtedness (leading, potentially, to increased costs of borrowing, and perceived risks of sovereign default, where no action is taken to address such deficits), the more immediate concern may be to reduce the gap between expenditure and revenue generation. Evidently, improved efficiency in public services, coupled with some retrenchment, will reduce public spending, but the exchequer may need to act to increase revenue take to completely close the gap between income and expenditure. Generating additional revenues from taxation may also limit the extent to which austerity has to bear the brunt of adjustment required to bring the fiscal position back into balance. In such situations, the question becomes one of which taxes to deploy to help reduce budgetary deficits.

To the extent that environmental taxes may have a role to play in such situations, their use as a means to reduce budget deficits is not so different to their deployment in the context of environmental tax reform: in both cases, it could be argued that the counterfactual situation (to that where additional environmental tax revenues are generated) is one where other forms of tax have to be used to generate the

[26] Patuelli, R., Nijkamp, P., and Pels, E. (2005) Environmental Tax Reform and the Double Dividend: A Meta-analytical Performance Assessment, *Ecological Economics*, Vol.55, No.4, pp.564–583

equivalent revenue.[27,28] As such, even where there are no explicit offsetting reduction in other forms of taxation, fiscal consolidation through increasing environmental tax revenue might implicitly reduce the level of other taxes below that which might otherwise have prevailed.

It should be noted that this study makes no specific assumptions about the way in which any revenue that might be generated from environmental taxes (or saved from the removal of environmentally harmful subsidies) should be used. For this reason (and for reasons associated with the project timeframe), no modelling of a 'tax shift' has been undertaken.

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[27] Jacobs, M., Ward, J., Smale, R., Krahé, M. and Bassi, S. (2012) *Less Pain, More Gain: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, November 2012, Report for Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change & the Environment, http://www.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PP-carbon-pricing-europe-fiscal-deficits.pdf

[28] Vivid Economics (2012) *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, Report for the European Climate Foundation and Green Budget Europe, May 2012

3.0 Key Issues

This Section raises some key issues associated with the approach to the study. This is intended to highlight some general features of the approach we have adopted.

3.1 Definitions Used

This study concentrates on environmental taxes, as opposed to charges. The definition that has been used is that of the European Commission of 2001, the same definition also being used in Regulation EU 691/2011 on '*European Environmental Economic Accounts*'. This defines environmental taxes as a tax "*whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment*".[29] Such taxes include taxes on energy, transport, and pollution and resources. They do not include VAT.

It is important to clarify terminology in respect of the transport taxes. Because taxes on transport fuels are classified as energy taxes, transport taxes are often referred to as 'transport taxes (excl. fuel)'. Although this is implicit in the definition of energy taxes, this terminology serves to ensure that readers who are not acquainted with the definitions understand that transport taxes – mainly related to either registration taxes, or circulation taxes, or vignettes – do not include taxation on transport fuels. The Eurostat publication, '*Taxation Trends in the European Union*', seeks to clarify matters further by referring to a subcategory of energy taxes which relate to the transport use of fuels as 'Transport fuel taxes.[30] Motor fuels are also one of the classes of energy carrier for which minimum tax rates are specified under the Energy Tax Directive (Directive 2003/96/EC, as amended).

It should be noted that where the term 'transport taxes' is used in this report without any qualifier, then this should be interpreted as referring to, 'transport taxes excluding taxes on transport fuel'. The term is used without qualification for the sake of the flow of the text.

3.2 Taxes or Charges?

Taxes are generally considered to be unrequited payments to (usually) national or regional governments with no individual counterpart service received in exchange for the payment. Charges, on the other hand, are typically payments made in exchange for a service, with the charges usually levied in proportion to the quantum of service received, and so the terms 'user charges', or 'cost recovery charges' are often used in this context.

This distinction is not always so clear cut. For example, some 'taxes' might be considered to have a 'cost recovery charge' element to them (for example, some

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[29] European Commission (2001) *Environmental Taxes – A Statistical Guide*, 2001 Edition, Luxembourg: Office for Official Publications of the European Communities, p.9.

[30] European Commission (2013) *Taxation Trends in the European Union: Data for the EU Member States, Iceland and Norway, 2013 Edition,* Luxembourg: Publications Office of the European Union.

vehicle taxes have, historically, been used to fund maintenance of transport infrastructure), but in this case, those paying the tax may not, themselves, be direct beneficiaries of the payments made. The distinction is also made more opaque by the fact that some 'taxes' are referred to as 'charges' (and vice versa). This often appears to be the case where revenues from what appear to be taxes, but are usually described as charges, are destined for Environmental Funds, whose purpose is (usually) to make use of the revenues generated for environmental projects. Equally, some user charges, which are used to fund the delivery of a service, are levied on an environmental basis.

The distinction is most difficult, perhaps, in respect of:

1. charges for waste water treatment, which typically have an environmental rationale (i.e. they vary by load of pollutant), but which might be sufficient only to recover the financial costs of the treatment being used; and
2. charges for water abstraction, which may also vary by the source of abstracted water, but may also be sufficient only to cover the maintenance and upkeep of the resource.

Where user charges accrue to Environmental Funds, there is an additional question to be considered regarding whether, and if so, how, any increases in the rates applied might accrue to the state budget. In principle, it might be possible to define, separately, revenues which are used to recover financial costs of relevant infrastructure and activities, and revenues which should accrue to the central (or regional) government budget. Unless it is clear that revenues would accrue elsewhere, the assumption has generally been that revenues would accrue to national finance ministries.

In addition to these cases, there are taxes in place on products and packaging which are applied only to a very limited extent since they are intended to induce (or at least, this is clearly their effect) those who place products or packaging on the market to participate in compliance schemes, or otherwise to demonstrate that they have met their obligations in respect of recycling and recovery.

In making suggestions for how existing regimes may be adapted, or when suggesting new taxes, the full complexity of the existing situation is not always completely understood. The approach taken for specific taxes under consideration is considered in the Appendix on good practice (A.1.0), and in the context of suggestions made for specific countries.

3.3 Allowance Trading Schemes

It is worth commenting on trading schemes here. They are of interest to this study to the extent that they have fiscal implications, and to the extent that Member States have freedom to influence the potential revenue generation from such schemes. For example, schemes may exist where, instead of grandfathering all allowances, some are, or could be, auctioned, with the associated revenue accruing to regional, or national governments. Price floors may seek to ensure that where allowance prices fall below a defined level, taxes are effectively applied to ensure a given level of incentive for environmental improvement.

Evidently, the major trading scheme of relevance to this study is the EU Emissions Trading Scheme (EU-ETS), the basis for which is Directive 2003/87/EC, as amended.[31] In Phase III of the scheme, the default means of allocating allowances is auctioning. The power sector is included under the EU-ETS, and in Phase III of the scheme, which commenced in 2013, no free allowances will be given to the power sector. Six of the countries in this study - Czech Republic, Estonia, Hungary, Lithuania, Poland and Romania - have availed themselves of a derogation (under Article 10(c) of the revised EU-ETS Directive) which allows them to allocate, free of charge, a diminishing number of allowances to existing power plants for a transitional period (the number allocated free of charge has to be zero by 2020). This is conditional upon the countries concerned making use of at least as much revenue as would have been obtained from auctioning the free allowances in the modernisation of their electricity sector. Otherwise, these countries might expect to see additional revenues flowing to them over time as a result of the progressive increase in the number of allowances being auctioned, whilst the effect on countries already auctioning all allowances to the power sector will depend on how the price of allowances changes over time (as the overall allocation is reduced).

Because of the rules governing the way in which the EU-ETS functions, we have not made major suggestions regarding how the power sector should be taxed other than in respect of air pollution (i.e., excluding greenhouse gases). In principle, it is possible for Member States to consider setting price floors (the UK, for example, has already done so), but we have taken the view that in the absence of a process being led at the European level, the implied message would be that the cap within the EU-ETS was insufficiently tight. Evidently, the EU-ETS is intended to address only those greenhouse gases covered by the scheme. However, it should also be considered that a minimum rate of tax for electricity (on the output side) exists under the existing (and proposed) Energy Taxation Directive. In addition, we have considered the situation in respect of the level of taxes on air pollution. For these reasons, we have not proposed changes other than in relation to air pollution taxation.

Perhaps more important is the way in which the relationship between the power sector and the EU-ETS influences whether or not one interprets some exemptions from energy excise duties as 'environmentally harmful subsidies' or not (see Section 3.4 below).

In addition, it should be mentioned that although the EU-ETS Directive provides for 15% of EU aviation allowances to be auctioned in Phase III, auctioning has effectively been suspended pending the development of a proposal from the International Civil Aviation Organisation (ICAO). For this reason, we have included consideration of schemes for taxing flights, recognising that the nature of the scheme anticipated is not completely clear at present. Such taxes could be removed, for example, if the

[31] A number of Commission Regulations and Decisions have also shaped the form and function of the EU-ETS – for a list of relevant legislation, see http://ec.europa.eu/clima/about-us/climate-law/index_en.htm#EU_ETS

nature of the market based instrument which ICAO proposes is such as to effectively replace the tax.

3.4 Environmentally Harmful Subsidies

A recent OECD review makes clear that there is no internationally agreed definition of an environmentally harmful subsidy:[32]

> *Currently, there is no common definition of an environmentally-harmful subsidy (EHS). The OECD definition, developed in 2005, has been generally used by analysts. This definition states that an EHS is "a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminates against sound environmental policies. All other things being equal, the EHS increases the level of waste, pollution and natural resource exploitation to those connected".*

The report highlights more and less restrictive definitions from various bodies such as the WTO, OECD and IEA, as well as the Global Subsidies Initiative.

It has long been clear that some – perhaps, most - countries deploy systems of subsidies to support various activities, often for political reasons.[33] Such subsidies could be considered from a variety of perspectives. For example:

1. Where activities which are known to be harmful are being subsidised, such as, where state support is offered for mining activities;
2. Where prices for potentially damaging products and services are supported;
3. Where specific activities are being exempted from taxes which might otherwise be expected to apply to the activity; and
4. Where externalities are generated by an activity, but where no tax (or other mechanism) is in place to internalise the damages believed to be caused.

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[32] OECD (2012) *Overview of Key Methods Used to Identify and Quantify Environmentally-harmful Subsidies with a Focus on the Energy Sector*, 14 September 2012, ENV/EPOC/EAP(2012)2, http://www.oecd.org/env/outreach/EAP(2012)2_NP_Subsidies%20report_ENG.pdf

[33] See, for example, Kosmo, M. (1987). *Money to Burn? The High Cost of Energy Subsidies*, Washington DC: World Resources Institute; OECD (1996) *Subsidies and the Environment: Exploring the Linkages*, Paris: OECD; OECD (1997) *Reforming Energy and Transport Subsidies: Environmental and Economic Implications*. Paris: OECD; OECD (1998) *Improving the Environment through Reducing Subsidies*, Paris: OECD, 2 volumes. Pearce, D.W and Finck von Finckenstein, D. (1999) *Advancing Subsidy Reforms: Towards a Viable Policy Package*. Paper prepared for UNEP: Fifth Expert Group Meeting on Financial Issues of Agenda 21, Nairobi, December 1999; Porter, G. (2002) *Subsidies and the Environment: an Overview of the State of Knowledge* COM/ENV/TD(2002)59. Paris: OECD; van Beers, C and van den Bergh, J. (2001). Perseverance of perverse subsidies and their impact on trade and environment, *Ecological Economics* 36. 475-486; Pearce, D. W. (2002) *Environmentally Harmful Subsidies: Barriers to Sustainable Development*, OECD Workshop on Environmentally Harmful Subsidies, Paris, 7-8 November 2002.

This report focuses on the first two of these. An analysis of the third type of subsidy, which could be considered as an 'implicit subsidy', would demand extensive research, not only in terms of taxes which are not in place, but also, the rates at which existing taxes are applied relative to the level of the externality.

In principle, identifying environmentally harmful subsides (EHSs) requires an extensive review of the whole budget, not merely the tax system. Given that the main emphasis of the report is on taxes, we have focused on three sources for the identification of EHSs:

1. Work undertaken by IEEP as part of their Steps to Greening reports in 2013;[34]
2. OECD work in respect of subsidies related to fossil fuels;[35] and
3. The Excise Duty Tables of DG-TAXUD, and in particular, the exemptions specified therein.[36]

A fourth source, a study undertaken by IVM, has also been used for some countries.[37] A fifth, which has been the source of figures for the IEEP study above, relates to company car taxation.[38] As well as being somewhat out of date, several experts consulted during this study commented to the effect that the figures for their country might be over-estimated.[39] We have used the figures from the study in this work, but note that they should be treated with caution.

It is important to note, reflecting the above discussion, that definitions of subsidies may vary across sources, and are sometimes inconsistently (or not extensively) applied by a given source. In some cases, subsidies have been identified which appear to be not so much 'environmentally harmful subsidies', but 'fiscally inefficient environmental subsidies'. These are subsidies which are offered to support environmental activities, but in ways that might not be the most efficient, effectively

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[34] IEEP (2013) *Steps to Greening Country Report: Czech Republic*, Report for the European Commission, pp.13-14

[35] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 127-136, dx.doi.org/10.1787/9789264187610-en

[36] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1* July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[37] IVM Institute for Environmental Studies (2013) *Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries*, Final Report, 15 January 2013, pp.38-40. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

[38] Copenhagen Economics (2009) *Taxation Papers: Company Car Taxation*, Report for European Commission, November 2009, p.28, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf

[39] As the report was being finalised, our attention was also drawn to work undertaken in France regarding EHSs, and annexed to the draft budget for 2014 (see République Française (2013) *Évaluation des Voies et Moyens, Tome II, Dépenses Fiscales*, Annexe au Project de Loi de Finances pour 2014, http://www.performance-publique.budget.gouv.fr/farandole/2014/pap/pdf/VMT2-2014.pdf)

allowing rents to accrue on the part of beneficiaries. The ongoing debate, in several Member States, around the appropriate levels of support for renewable energy provides a good example of such discussions. We have not included these in our list.

It should be stated that the identification of EHSs is likely to arouse some political discussions. Two categories of EHSs which have been defined in other studies appear to stand out in this respect:

1. Exemptions from tax for household heating fuels; and
2. Lower rates of VAT on food.

Evidently, one view might be that taxes should be applied without exemptions, with the welfare system designed to address matters of distribution. However, perhaps because of their contentious nature, both types of subsidy are allowed under existing Directives. Pearce addressed this issue in a paper in 2002:

> *"…some OECD countries practise differential household energy sector taxation in order to protect low income and other socially vulnerable households. The absence of a tax, or the existence of lower taxes in the household sector, can be viewed as a subsidy. While there may be disagreements about the efficiency of achieving social goals through subsidies, the fact is that there may well be a trade-off between environmental damage and the achievement of socially fair taxation. Hence, while the focus of this Workshop is quite rightly on environmentally harmful subsidies, it is not sufficient to cease the analysis once environmentally harm has been determined. The social and economic effects must also be gauged so that any trade-offs can be highlighted".*[40]

He could have added the fact that the political calculus is also important. We have not considered exemptions from heating fuels or reduced VAT rates on food as environmentally harmful subsidies in this study.

We have supplemented the subsidies identified by other studies with our own calculations of the potential revenue foregone from what appear to be subsidies in the form of exemptions for taxes in place on energy. In this respect, and recognising the position of power generation under the EU-ETS (see above), we have not considered exemptions from duties on energy carriers for the purposes of power generation as an environmentally harmful subsidy. As well as the fact that the power generation sector no longer receives (other than to the extent that the Directive explicitly allows countries to do otherwise for a transitional period) free allowances, we have proposed air pollution taxes where these do not exist, albeit these may still be at rates somewhat below what may be the externalities associated with those air pollutants. The existing ETD (and the proposed revision) also sets minimum rates of tax for electricity.

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[40] Pearce, D. W. (2002) *Environmentally Harmful Subsidies: Barriers to Sustainable Development*, OECD Workshop on Environmentally Harmful Subsidies, Paris, 7-8 November 2002.

3.5 VAT

The changes suggested in this study (in terms of changes in tax rates as well as removal of EHSs) could be expected to have implications for the budget through their effect on the overall VAT take. We have not calculated these in this study.

In general, these could be expected to be positive since VAT is generally raised on the price of a good inclusive of the environmental tax. Though businesses might be able to reclaim VAT, consumers will not generally be able to do so. Furthermore, other than for items such as single-use carrier bags, the response of consumers to the taxes is not expected to be especially strong (the demand for many of the goods and services is, especially over the short-term, relatively inelastic – see Appendix A.2.0 for a review in respect of energy, for example). In principle, therefore, additional VAT revenues might be expected to accrue to the central budget. The amounts will, however, depend upon the applicable VAT rates, and the changes in demand for the goods / services being taxed.

3.6 Administrative Costs

The suggested taxes will each have, associated with them, an administrative cost. These costs will tend to vary depending upon the nature of the good or service being taxed, whilst the incremental costs of the administration (arguably, what matters most here) depend very much on the administrative apparatus already in place.

From the budgetary perspective, it is clear that taxes which require a considerable amount of administration relative to the revenue they generate are of limited value. Some authors have expressed concerns regarding these costs where some charges / taxes are concerned. Vítek et al suggest that in the Czech Republic, the charges on air pollution that were collected from medium-sized sources at a cost which exceeds the revenue generated.[41] The same authors cite some estimates of administrative costs of introducing environmental taxes:

> *"Convery, McDonnell and Ferreira (2007) demonstrate that regularly administrative costs for plastic bag levy in Ireland are approximately 3 % of revenue because of it is possible to integrate reporting and collection into existing Value Added Tax reporting systems.*
>
> *OECD (2006) in its summary publication states in the chapter eight, that AC for a collection of environmental charges and evaluation of environmental projects in Poland vary between 0.8 % and 4.5 %. According to OECD (2005), administrative costs for the government related to the aviation fuel tax (Norwegian aviation fuel tax) are very limited. Sweden National Tax Board presented that CO_2 tax incorporated into the existing petroleum tax, energy*

[41] Vítek, Leoš, Pavel, Jan, Jílková, Jiřina (2007*) Comparison of the Administrative Costs of the Environmental Charges on Air Pollution for Large and Extra-Large Sources of Air Pollution*, Banská Bystrica 4th December 2007, in Marta Orviská ns Peter Pisár (ed.). Európske Financie – Teória, Politika a Prax (European finance - theory, politics and practice) [CD-ROM]. Banská Bystrica : Ekonomická fakulta Univerzity Mateja Bela, 2007, s. 15. ISBN 978-80-969535-8-5

tax, and environment tax on domestic air traffic is from the perspective of AC effective (AC for collecting are approximately 3 mil. SEK)."

The first paragraph, regarding the Irish levy on plastic bags, indicates that even where the revenue generated by a tax is relatively low, the administrative costs do not need to be high. Pavel and Vitek appear to confirm this:[42]

> *"Overviews of studies presented in Vaillancourt (1987), Evans (2003) and Klun and Blazic (2004) of personal, corporate and sales taxes, on the one hand, and existing modest evidence for environmental taxes on the other hand, indicate that the transaction costs of environmental taxes are rather low compared with those of other taxes, notably income taxes."*

They add, by way of explanation:

> *"This is due mainly to their design, in the case of energy and mineral oil taxes based on the principles of excise duties (a small number of taxpayers, a tax base oriented around market transactions, and a relatively simple construction of the tax base). In this way both the administrative costs of governments and the compliance costs of the private sector are reduced"*

Evidently, not all taxes have this character, but through relying on existing mechanisms for reporting on transactions, or on emissions, the administrative costs can be minimised.

It is not possible to consider all the existing charges and taxes in this study, and to comment on the administrative costs of revenue collection. It is clear, however, that when considering the introduction of new taxes, due consideration should be given to how to make best use of existing administrative structures as a means to simplify administration of the tax, and reduce the costs of collecting revenue. It might also be the case that some taxes which exhibit high administrative costs relative to their revenue generation do so for the simple reason that the tax rates are too low to generate significant revenue (not least in situations where there has been no indexing of rates over an extended period of time). Finally, it may be considered that where existing reporting mechanisms do not exist, the fact that taxes can help to drive the provision, and capture of, data has some value in itself beyond that of the revenue generated by the tax.

3.7 Revenue Estimates

The revenue estimates that have been made for each tax are based on the what might be expected if the tax is implemented in isolation, and with no assumption made regarding what might happen if other taxes (such as those on employment) were changed at the same time. They are estimates based on a set of assumptions which are set out in this document.

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[42] J Pavel and L Vitek (2012) *Transaction costs of environmental taxation: the administrative burden*, pp 273-282 in J Milne and MS Andersen (eds) Handbook of research on environmental taxation, Cheltenham: Edward Elgar.

Two things follow from this:

1. The revenues actually generated from any given tax which has been suggested should not be treated as perfectly accurate given that they are based upon assumptions regarding tax rates, and the response to them, which might be different to what occurs in reality;
2. Because the implementation of one tax may have implications for the revenue generated from another tax (for example, vehicle taxes might effect, over time, the use of fuel, and hence, the revenues generated from transport-related fuel taxes), then if a range of taxes is introduced, these interactions need to be taken into account.

It should also be considered that tax revenues generated would also be affected by decisions regarding whether or not to deploy changes in taxes as part of a tax shifting process.

4.0 'Good Practice'

In this section we outline the approach to making suggestions for new environmental taxes, or changes in existing ones. In Section 5.1 below, we indicate how we have estimated the revenue that may generated by such taxes. On energy and transport, as will become clear, we have been guided by the proposed revision to the Energy Tax Directive,[43] referred to as 'the proposed ETD', and the Commission's proposal of 2005 regarding vehicle taxation,[44] Referred to as 'the Commission's 2005 proposal'. The former is still being debated, whilst the latter never became law, but they are considered to represent the Commission's most recent publicly available view regarding these two taxes, and it was agreed with the Steering Group to base suggested changes around these. The exposition below is a summary of a more comprehensive Appendix produced in the context of the study. The reader is referred to Appendix A.1.0 for further details. This also indicates that in many cases, the presumption is that taxes are indexed to a measure of inflation to ensure that the incentive conveyed is not eroded by inflation.

4.1 Energy

The proposed ETD sets out a formula which seeks to equalize treatment of different fuels within a given grouping. It proposes adoption of a formula for the calculation of tax rates which suggests that the tax rate for all fuels in a given group (motor fuels, motor fuels used in commercial and industrial purposes,[45] and heating fuels) is based on:

1. a common rate of tax per unit of energy content; and
2. a common rate of tax per unit of CO_2 emissions (considered in the proposal to be set at €20 per tonne CO_2).

It suggests that whether the rates set in a Member State are at or above the proposed minimum rates, this formula should be applied to ensure equal treatment. It also has the merit of identifying a specific CO_2 component, enabling entities included in the EU-ETS to be exempted from that specific element of any tax.

4.1.1 Motor Fuels

Most countries have set rates higher than the minimum rates in the proposed ETD for at least one energy carrier within this group of fuels. Given the emphasis in this study on the potential for generating revenue, then suggested changes are based on upward harmonization of tax rates within the group of transport fuels to the rate which is, according to the formula set out in the proposed ETD, the highest in terms of the implied rate of tax per unit of energy content, assuming that the CO_2 element of the duty is €20/tonne of emissions of CO_2. Where this

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[43] This is considered in the form in which it exists as a firm proposal: European Commission (2011) Proposal for a Council Directive amending Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity, Brussels, COM(2011) 169/3, http://ec.europa.eu/taxation_customs/resources/documents/taxation/com_2011_169_en.pdf

[44] European Commission (2005) Proposal for a Council Directive on Passenger Car Related Taxes, Brussels, 5.7.2005, COM(2005) 261 final, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0261:FIN:en:PDF

[45] As set out in Article 8(2) of the (existing and) proposed ETD.

implied rate of tax per unit of energy is below the minimum level proposed in the ETD, the minimum level in the ETD becomes the basis for harmonization.

4.1.2 Motor Fuels used for Purposes Set Out in Art. 8(2) of the ETD

The same approach is adopted as for motor fuels above. It should be noted that the proposed ETD indicates, for the calculation of minimum rates of tax, much lower rates per unit of energy content for these uses than for Motor Fuels (€0.15/GJ as opposed to €9.6/GJ).

4.1.3 Heating Fuels

The same approach is applied for heating fuels with one modification. Within the group of heating fuels, some fuels (notably kerosene and diesel / gas-oil) are taxed at the same rate for heating as for motor fuels. If tax rates were harmonised on this basis, it would imply enormous increases in heating tax rates given the difference in the minimum rate per unit of energy content for heating and for motor fuel in the ETD (€0.15/GJ as opposed to €9.6/GJ). For this reason, we have calculated the implied tax rate per unit of energy for the other heating fuels, and then harmonized fuels upwards on the basis of the highest level within this sub-set of heating fuels.

4.1.4 Electricity

For electricity, the proposed approach is to increase electricity taxes to the level proposed in the ETD (€0.15 /GJ) where they are not already at that level (in principle, this is generally the case since the proposed ETD minimum rate is little different to that in the existing ETD (Directive 2003/96/EC).

4.1.5 Indexation

In line with Article 4(4) of the proposed ETD, we have indexed rates in line with inflation to maintain the price signal imparted by the above taxes.

4.2 Transport (excl. transport fuels)

The considerable variation in approaches and experience with taxation on vehicles, and with vignettes, makes it difficult to propose an unequivocal package of measures in the case of the taxation of transport (excluding transport fuels). Directive 2011/76/EU on the charging of heavy goods vehicles for the use of certain infrastructures sets common rules on distance-related tolls and time-based user charges for vehicles with a maximum permissible gross laden weight of not less than 12 tonnes.[46] For Heavy Goods Vehicles, this provides a clear way forward in respect of good practice.

[46] Directive 2011/76/EU amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures, OJEU 14.10.2011, L 269, pp.1-16, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:269:0001:0016:EN:PDF

Revenue generation from transport taxes (excl. fuel) varied from 0.05% GDP to 1.49% GDP across the EU-28 in 2011.[47] When revenues from transport fuels are included, the variation is from 1.31% GDP to 3.01% GDP.[48] There is clearly considerable potential for further revenue generation from taxation of transport over and above that raised from fuels.

The countries examined have different combinations of registration and circulation taxes. The approach we have adopted is to suggest that the overall revenue take from transport, including revenue from transport fuels, is moved to levels equating to the average of upper quartile performance in the EU-28, expressed in terms of GDP, this being 2.67% GDP. This is effectively used as a revenue target. Where Member States are below this, we have considered what revenue gap exists, and the extent to which that gap is closed by increased taxes on transport fuel (see above).

In terms of the means used to close that gap, in line with the Commission's 2005 proposal, we have suggested that circulation taxes are increased, and that these are banded in such a way as to encourage a shift to vehicles with lower emissions (not only of CO_2, but also, other pollutants such as particulate matter). Several Member States already have such taxes in place. It is suggested that the banding is adjusted periodically to reflect technological change, to maintain incentives to use vehicles with lower emissions, and maintain revenue levels. We also suggest that Member States give consideration to their approach to taxing HGVs in line with Directive 2011/76/EU.

4.2.1 Aviation

Some Member States deploy levies on passenger flights. Aviation emissions have been included under the ETS since the start of 2012, and 15% of EU Aviation Allowances (EUAAs) were to have been auctioned. In April 2013 the EU decided to temporarily suspend enforcement of the EU ETS requirements for flights operated in 2010, 2011, and 2012 from or to non-European countries, while continuing to apply the legislation to flights within and between countries in Europe. In October 2013 the International Civil Aviation Organization (ICAO) Assembly agreed to develop, by 2016, a global market-based mechanism (MBM) addressing international aviation emissions and apply it by 2020.

We have suggested the introduction of passenger levies based on distance. For the purpose of modelling, the data available to us relates to flights within the country concerned, outside the country concerned but within the European Union, and outside the country concerned, and outside the European Union. As a proxy for a distance related tax, we have applied levels of tax of €15 per passenger, €25 per passenger and €50 per passenger, respectively, for these different types of flight. We would, however, expect Member States to set such taxes with reference to distance rather than what is, effectively, a country listing. In addition, in line with the approach adopted in France, we have also suggested a tax of €1.25 per tonne of freight carried by air. We have assumed these rates are maintained in real terms over time.

It should be noted that the interface with the mechanism to be proposed by the ICAO would need to be kept under review. That mechanism could lead to some revenue being generated

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[47] European Commission (2013) *Transport in Figures 2013, Part 2: Transport*, Directorate General for Mobility and Transport, Tables 2.1.11 and 2.1.12.

[48] European Commission (2013) *Transport in Figures 2013, Part 2: Transport*, Directorate General for Mobility and Transport, Tables 2.1.11 and 2.1.12.

through the auctioning of allowances to the aviation sector (as had been envisaged under Phase III of the EU-ETS).

4.3 Waste

A recent report from the European Commission highlights both the variability in landfill taxation, but also, its importance in driving improved waste management.[49] The suggested approach is based upon moving tax rates for landfilling to a level of €50 per tonne where they are below this level. The implementation of major changes in landfill tax in short periods of time without prior announcement can be problematic in a sector which is characterised by long lead times. As such, the implementation is phased over a period of years, depending upon the rate of tax already applied in the Member State concerned.

In order to ensure landfill taxes generate movement of waste into upper tiers of the hierarchy, it is also suggested that a tax is implemented on incineration. Although Denmark has a much higher tax rate for incineration, the suggestion is that rates similar to those in France would be appropriate. The tax rate proposed is €15 per tonne, with the rate being phased in so that it is achieved in the same year as the landfill tax proposed above.

As regards inert (construction type) wastes, for countries with no tax in place at present, it is suggested the tax is set at €2.40 per tonne. In conjunction with aggregates taxes (see below), such taxes can help to encourage recycling of construction wastes for use as secondary aggregates.

These taxes are assumed to be indexed to inflation (either through index linking, or through periodic adjustments to rates).

4.4 Packaging

Although Member States have made major strides in respect of packaging recycling, there has been less emphasis on packaging waste prevention. Some countries included in this study make use of deposit refund schemes which may increase use of refillable beverage packaging relative to the counterfactual scenario. The recently abolished Danish tax appears to have had some success in constraining the growth in packaging. [50] The suggested approach for packaging is to introduce a tax which reflect the embodied greenhouse gas emissions of materials typically used in packaging. This is a relatively conservative approach to the extent that such a tax does not account for other impacts associated with manufacture of such materials.

The tax was modelled as being introduced in 2016. The rates are assumed to be indexed to inflation.

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[49] E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

[50] The Nordic Council (2008) *Extension of environmental taxes,* consulted October 2008 http://www.norden.org/webb/news/news.asp?id=6237

4.5 Single-use Carrier Bags

Plastics dominate marine litter and represent a significant threat to the marine environment due to their abundance, longevity in the marine environment and their ability to travel vast distances.[51] Despite representing only 10% of all waste produced, plastics account for between 50-80% of marine litter and this is not expected to decline for the foreseeable future (particularly as plastics do not degrade quickly).[52] Terrestrial litter is also increasingly recognised as problematic, and a source of considerable disamenity.[53]

There is a growing body of evidence which highlights the dramatic reduction in use of single-use carrier bags that a simple tax can generate. The suggested approach is a tax on all single-use carrier bags (not just plastic ones) as a means of encouraging the use of reusable bags, and reducing terrestrial and marine litter. The rate, reflecting levels which appear to have achieved major reductions elsewhere, has been proposed as €0.10 per bag. This has been adjusted to reflect purchasing power in the different Member States. Where the countries concerned already have such taxes in place, they are increased to this level. Experience indicates that allowing such taxes to be hollowed out by inflation leads to an increase in consumption, so indexing of these rates is assumed to occur.

4.6 Air Pollution

Several Member States implement taxes or charges on air pollution. Such taxes provide incentives for further abatement of emissions which are harmful to human health, and are especially important in countries which are experiencing exceedence of air quality thresholds. Most existing taxes (where they exist at all) are, typically, well below the levels of the externalities which are believed to be generated. The suggestion is that there is scope for introducing such taxes where other equivalent schemes (such as emissions trading) are not already in operation, and for increasing them where they already exist. We have suggested rates of €1,000 per tonne of SO_2, €1,000 per tonne of NOx, and €2,000 per tonne of PM_{10} (and / or €3,000 per tonne of $PM_{2.5}$). Such rates are still well below the level of the externalities generated, but are more likely to generate some additional incentive for abatement. The suggested transition period from existing rates, or where there is no air pollution tax in place, is from 2015 to 2018, and the rates are assumed to be indexed to inflation.

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[51] KIMO (2010) Economic Impacts of Marine Litter, Kommunernes Internationale Miljøorganisation Local Authorities International Environmental Organisation, September 2010, available at http://www.kimointernational.org/Portals/0/Files/Marine%20Litter/Economic%20Impacts%20of%20Marine%20Litter%20Low%20Res.pdf

[52] Thompson, R.C., Swan, S.H., Moore, C.J. and vom Saal, F.S. (2009a) Our Plastic Age. Philosophical Transactions of the Royal Society B: Biological Sciences 364(1526): 1969-2166; Barnes, D.K.A., Galgani, F., Thompson, R.C. and Barlaz, M. (2009) Accumulation and fragmentation of plastic debris in global environments. Philosophical Transactions of the Royal Society B: Biological Sciences 364(1526): 1985-1998; Thompson, R.C., Moore, C.J., vom Saal, F.S., and Swan, S.H. (2009b) Plastics, the environment and human health: current consensus and future trends. Philosophical Transactions of the Royal Society B: Biological Sciences 364(1526): 2153-2166.

[53] Eunomia (2013) *Exploring the Indirect Costs of Litter in Scotland*, Report to Zero Waste Scotland, http://www.zerowastescotland.org.uk/sites/files/wrap/Indirect%20Costs%20of%20Litter%20-%20Final%20Report.pdf

4.7 Water Abstraction

The need for providing improved incentives for management of the water resource varies on a catchment by catchment basis. A number of countries already apply taxes on water abstraction as a means to reduce exploitation of the water resource and to address leakages. Such measures may also encourage companies to adopt measures to improve resource efficiency.

The suggested approach takes, as its point of departure, the Danish scheme, considered to be good practice for households, and the Dutch scheme, as good practice for businesses, with the lowest business rate applied in the Netherlands also applied to agricultural abstractions. The Danish and Dutch rates are weighted according to indices of purchasing power parity. It was also considered desirable to reflect some indicator of water scarcity in the proposal. Although there is no perfect indicator in this regard, the indicator used was the water exploitation index. PPP-adjusted rates were multiplied by:

- 0.25 for MS with a WEI <10%
- 0.50 for MS with a WEI >10%, <20%
- 0.75 for MS with a WEI between >20%, <30%
- for MS with a WEI between >30%

The rates applied are shown in Table 7 below, and are phased in over a period to 2018. After this, they are assumed to be indexed in line with inflation.

Table 7: Suggested Tax Rates for Water Abstraction (€/'000 m^3)

	Public supply	Manufacturing	Agriculture
Austria	150	90	12.5
Belgium	600	360	50
Croatia	90	55	7
Czech Republic	190	115	16
Estonia	190	120	16
France	300	180	25
Hungary	80	50	7
Italy	400	250	35
Lithuania	80	50	7
Poland	155	95	13
Romania	65	40	6
Slovakia	90	55	8

4.8 Discharges to Waste Water

The review of good practice identified the Dutch system as being the most comprehensive and well designed. A number of countries included in this study have systems of waste water charges in place, some of these being extremely comprehensive in their pollutant coverage.

The absence of a comprehensive dataset on emissions to waste makes it difficult to understand the existing situation in different countries, and makes modelling of revenue from any taxes rather challenging. In this case, we have modelled a tax only on BOD, which is set at the Dutch tax rate for BOD, €2.47/kg BOD in 2013. The rate applied in each Member State is adjusted for relative purchasing power in the different countries. The rates applied are as shown in Table 8.

Table 8: Rate of Tax to be Applied for BOD, €/kg

MS	AT	BE	CZ	EE	FR	HR	HU	IT	LT	PL	RO	SK
Tax rate	2.47	2.49	1.58	1.60	2.51	1.47	1.29	2.25	1.35	1.30	1.09	1.52

4.9 Pesticides

A number of Member States have, or have had, pesticides taxes in place. In the past, it was common to set taxes based simply on the amount of active ingredient used. Good practice is to band the tax according to the potential impact of the pesticide in the environment, with Norway and Denmark being prime examples of this approach.

Member States have developed national action plans for the management of the use of pesticides.[54] Several of these indicate a desire to reduce use of pesticides, and to reduce the risks associated with their use. Suitably designed pesticide taxes have a role to play in this regard. It remains possible, also, that this can improve the efficiency of agriculture by signalling to farmers the need to consider the rate of application of existing products.

It has not been possible to gain data for each country disaggregated by the nature of the active ingredient. We have, therefore, modelled revenue generation based on a tax per unit of active ingredient, though we would expect the instrument to be designed with banding of active ingredients by some indicator of potential impact. The tax rate used is based on the level of the Danish and Norwegian taxes, and the equivalent revenue per kg active ingredient. We have suggested a central rate of €10 per kg active ingredient, and adjusted this in line with differences in relative price levels of the various national agricultural sectors. The adjustment index refers to the effective CAP support schemes per hectare of utilised agricultural area in MS, and has been derived from the CAPRI-model.[55] The resulting tax rates at MS level are indicated in Table 9 below.

[54] See http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm

[55] Annex III 'Intensity of spending for CAP pillar 1 and pillar 2 per hectare of UAA' in European Environment Agency (2009) *Distribution and Targeting of the CAP Budget from a Biodiversity Perspective*, EEA Technical Report 12/2009.

Table 9: Tax Rates Suggested for MS for Pesticides Based on Relative Levels of CAP Support (€ per kg active ingredient)

Rate	€2.50	€5.00	€7.50	€10.00	€12.50	€17.50
Countries	EE	LT PL SK RO	CZ	HU HR AT	FR IT	BE

The suggested transition period from existing rates, or where there is no such tax in place, from zero rates, is from 2016 to 2018. Thereafter, rates are assumed to remain constant in real terms.

4.10 Fertilisers

Relatively few countries have currently taxes on fertilisers. Usually, the focus has been on nitrate pollution, with phosphate being of some interest also. Although there has been some experience with nutrient surplus taxation in the Netherlands, a decision by the European Court in the MINAS case, that input taxation is required for a scheme to be compatible with the Nitrates Directive, suggests that a tax should be based on the input of nutrients, and not to surpluses over a specified level.[56] The Dutch scheme was abandoned as a result of this ruling.

We have suggested a rate of €0.2 per kg N applied, and have, as with the rates of pesticides tax above, adjusted this in line with differences in relative price levels of the various national agricultural sectors. The resulting tax rates at MS level are in Table 10 below.

Table 10: Tax Rates Suggested for MS for Nitrogen Fertilisers Based on Relative Levels of CAP Support (€ per kg N)

Rate	€0.05/kgN	€0.10/kgN	€0.15/kgN	€0.20/kgN	€0.25/kgN	€0.35/kgN
Countries	EE	LT PL SK RO	CZ	HU HR AT	FR IT	BE

The suggested transition period from existing rates, or where there is no such tax in place, from zero rates, is from 2016 to 2018. Thereafter, rates are assumed to remain constant in real terms.

4.11 Aggregates

Few materials are subject to primary resource taxes in the EU-28. Aggregates stand out in this regard, partly because they are not so widely traded, and for the associated reason that their relatively low value but considerable bulk means that they tend to be transported only over relatively short distances (albeit with some exceptions). Impressive results from the combined effect of taxes on aggregates and on the landfilling of construction and demolition (C&D) wastes

[56] European Court, 2002, Case C-322/00, Commission v. Netherlands, Opinion of Advocate General Léger.

have been observed in the UK. The instrument should be considered in conjunction with the suggestion above (regarding the taxation of landfilled C&D wastes).

It is suggested that the implementation of such taxes should be such that the rates applied to aggregates in the UK (€2.40 per tonne) are applied to the types of materials covered by such taxes. There appears to be little reason to phase this tax in. It is suggested that the tax is implemented at, or raised to, this rate by 2016. It is assumed that the tax rate is indexed to inflation.

4.12 Competitiveness Issues

The above discussion has not entered into the detail of how countries might seek to ensure that domestic industries are not rendered less competitive in export markets. However, in principle, this can be overcome through the specification of the taxable event such that exports are effectively exempt from the tax (though they could be taxed in the destination country). It might be appropriate for the opposite to be the case where what is being exported is effectively a service (for example, incineration of waste). In this case, it may be more appropriate to tax exports of waste, and exempt waste imports.

4.13 Regulatory Issues

It should be noted that when any environmental tax is introduced, or changed, the nature of incentives confronting the various actors in the affected markets also changes. The altered structure of incentives will incentivise means to evade the impact of the tax, including behaving illegally.

In this context, the potential for such behaviour to arise (and give rise to environmental problems) needs to be considered and anticipated. As such, it may be sensible to consider strengthening of the relevant regulatory apparatus, including the sanctions that may be applied, in advance of, or alongside, the tax's introduction. A classic examples in this respect is in terms of responses to taxes on landfilling, in which respect, the potential for triggering illegal, or questionable activities should be considered.

5.0 Estimating Revenues and Indirect Benefits

This section summarises the approach to calculating the revenue potential resulting from the application of environmental fiscal reform in the 12 Member States. The detailed approach is described in Appendices A.2.0 and A.3.0.

5.1 Revenue Implications of Good Practice

In calculating the revenue potential resulting from environmental fiscal reform in the 12 Member States, a number of approaches were taken depending on the different types of taxes. These approaches are outlined as follows (note this approach is detailed in Appendix A.2.0 with full references to data sources):

- **Energy taxes:**
  - The overall approach to Estimating Revenues from energy taxation was to seek to perform the calculations at the lowest level of granularity possible. In most cases revenue data is not broken down by fuel type, and it is not possible to access Member State's detailed budgets. Therefore making exact revenue calculations is not possible. The approach was to use as detailed data as possible on the quantities of fuels consumed in the Member States, along with the latest published excise duty rates, in order to estimate the revenue potential by fuel type.
  - The first step is to align the energy consumption data (from the International Energy Agency tables) with the categories of excise duties in the ETD. The categories in the IEA tables are not disaggregated to the same extent as the excise duties, and as such some simplifying assumptions were needed to apportion fuel consumption to different excise duties (gas oil as an industrial / commercial motor fuel versus as a heating fuel, for example).
  - Once the consumption of fuels had been split out to the extent possible, the existing excise duty rates were applied to the fuel quantities and the resultant proportions used to 'pro-rate' the latest total revenue figures (from official sources) to the different categories of fuel. The implied tax base for each fuel category was then calculated.
  - Baseline fuel consumption was assumed to remain constant in future years. To estimate a change in demand for the different fuel an own-price elasticity calculation was performed. It is recognised that there would be substitution effects in the consumption of fuels (using cross-price elasticities also would be ideal) but the aim was to show some level of realism in the revenue forecasts, not to generate complex forecasting models. The elasticities were then used to estimate a reduction in the tax base based upon the percentage change in the price of the fuel as the excise duty rates were increased – based upon the application of good practice (see Section 4.0). Some assumptions around fuel pricing were also needed to perform this calculation.
  - The 'adjusted' tax base was then multiplied by the tax rates (assumed to stay constant in real terms i.e. adjusted upwards for inflation on an annual basis), to calculate future revenue generation by fuel type.

- **Transport taxes (excl. transport fuels):**
  - Vehicles – the calculation of revenue was undertaken simply by multiplying the % GDP increase in tax revenue by GDP in real terms for future years. GDP was assumed to increase at the same rate as the latest real GDP growth rate projection made by Eurostat (i.e. the rate for 2015 by Member State was used to project GDP out to 2025).
  - Passenger aviation – an elasticity based approach was taken, with data on the number of passenger flights taken from Eurostat. The tax base was projected forward based upon historic trends, and revenue calculated by multiplying the rate by the adjusted tax base (and the same was done with all the taxes listed below).
  - Air-freight – a simple overall reduction estimate to the tax base was made given the lack of relevant elasticities and price data. Data on the amount of freight transported was taken from Eurostat.
- **Pollution and Resource Taxes:**
  - Waste disposal – revenues from taxes on landfilling and incineration / MBT were calculated based upon a tax base adjusted using an elasticity approach. Data was taken from the European Reference Model on Municipal Solid Waste Management.
  - All other pollution and resource taxes were calculated by taking evidence from the literature on the levels of reduction in demand that might be expected following the implementation of a tax (in percentage terms) or where no evidence was available, assuming marginal decreases to take some price-response into account. The following types of data were taken for the historic tax bases for each of the relevant taxes.
    - Landfilled construction and demolition mineral wastes (Eurostat – Waste Statistics Regulation);
    - Aggregates extracted for domestic use (Eurostat – Material Flow Accounts);
    - Packaging generation (Eurostat – Packaging Directive);
    - Single-use carrier bags (CBA – DG Environment);
    - Air emissions of SOx, NOx and PM (EEA – Airbase);
    - Water abstracted for public water supply, manufacturing purposes and agriculture (Eurostat);
    - Discharge of water from waste water treatment plants (EEA – Urban Waste Water Treatment Directive);
    - Sales of active ingredients in pesticides (Eurostat);
    - Use of nitrogen in fertiliser (Eurostat).

5.2 Indirect Benefits

The project specifications state that data on indirect benefits resulting from environmental fiscal reform should be presented. Our approach, therefore, has been to estimate potential environmental benefits which result from increases in rates of taxation. This cannot be comprehensive in a study of this duration, so the aim has been to seek quantification of some of the environmental benefits rather than all of them.

The following points summarise the methodology:

- Data on the tax bases, and how they change based upon increased levels of taxation, is presented in Appendix A.3.0. This indicates the reduction in demand for the activities which are taxed (and which have an environmental impact);
- The environmental impacts from the following main activities were included:
  - Change in use of transport fuels;
  - Change in use of fuels used in stationary engines;
  - Change in use of fuels used for heating;
  - Change in the use of electricity;
  - Change in emissions to air of certain air pollutants from industrial processes and power plants ;
  - Change in the use of vehicles;
  - Change in the number of passenger flights;
  - Change in the demand for air freight;
  - Diversion of mixed municipal type wastes from landfill;
  - Diversion of mixed municipal type wastes from incineration and MBT plants;
  - Change in the amount of water abstraction;
  - Change in the amount of pesticides produced;
  - Change in the amount of aggregates extracted;
  - Change in the generation of various types of packaging wastes;
  - Change in the production of single-use carrier bags; and
  - Change in the production of nitrogen based fertilisers.
- Factors for the emission of greenhouse gases and other air pollutants were taken from the literature;
- Damage costs were applied to the air emission to estimate a 'value' of the offset environmental damages, resulting in an estimate of benefit;

- Carbon was valued using the approach applied in the proposed Energy Tax Directive (€20 per tonne CO_2 eq). Other air emission (such as NOx, SOx and particulates) were valued using data from the European Environment Agency;[57]
- The total 'indirect' environmental benefits are then presented along with the revenue estimates.

[57] The methodology used is summarised in: European Environment Agency (2011) *Revealing the Costs of Air Pollution from Industrial Facilities in Europe*, EEA Technical Report No 15/2011, November 2011.

6.0 Austria

6.1 Country Overview

6.1.1 Key Facts about the Economy and Tax System

- Between 2004 and 2008, Austria experienced stable economic growth, with GDP increasing at an average rate of 2.8% per annum in real terms. The onset of the economic crisis led to a 3.8% drop in GDP in real terms from 2008 to 2009. GDP returned to growth after 2009, increasing at an average rate of 1.8% per annum in real terms between 2009 and 2012.[58]
- Austria's overall tax revenue (including social contributions) is high compared to most member states, at 44.5% of GDP (in 2012). Austria has always had a relatively high level of tax as a share of GDP, though it has fallen slightly from 46.2% of GDP in 2001.[59]
- Income from taxes is split fairly evenly between direct taxes (30% in 2012), indirect taxes (33%) and social contributions (37%). Following the financial crisis, the shares from social contributions and from direct taxes fell slightly.[60]
- In 2012, the latest year for which data is available, environmental taxes accounted for 2.44% of GDP. Between 2003 and 2010, environmental tax revenue fell from 2.73% of GDP to 2.38% of GDP before increasing slightly to its current level.[61]
- The largest proportion of revenues from environmentally-related taxation in 2012, the latest year for which data are available, was associated with energy taxes, which accounted for 1.63% of GDP. Taxes on transport (excl. transport fuels) also accounted for a significant proportion of revenues, at 0.78% of GDP, whilst taxes on pollution and resources accounted for just 0.02% of GDP.[62]
- In 2012, energy taxes accounted for 67% of environmental tax revenues, up from 65% in 2001.[63]

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[58] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[59] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[60] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[61] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

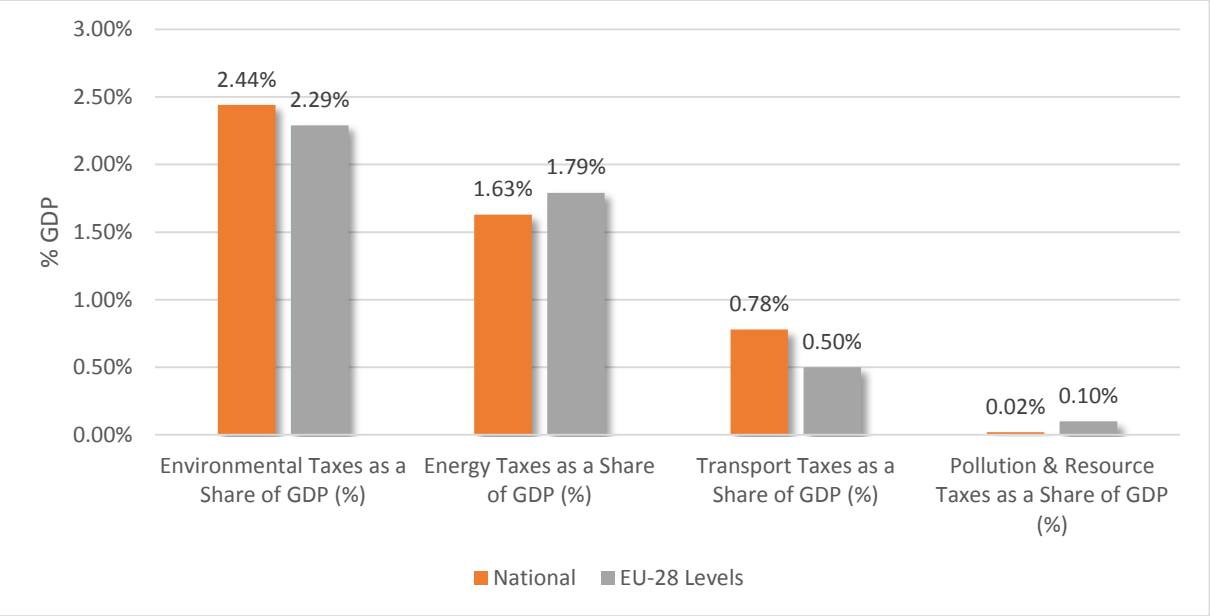
[62] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[63] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

6.1.2 Relative Position within the EU

- In 2012, revenues from energy taxation, expressed as a share of GDP, were somewhat below the EU-28 level of 1.79%. Revenues from transport taxes (excl. transport fuels) were well above the EU-28 level of 0.5% of GDP, whilst taxes on pollution and resources were far below the EU-28 level of 0.10% GDP (see Figure 1).[64]

Figure 1: Environmental Taxes as a % of GDP vs EU-28 Levels (2012)



Source: Eurostat data

- In 2012, Austria ranked 17th in the EU-28 in terms of the ratio of environmental taxes to GDP (Table 17).[65] In terms of the revenue generated by energy taxes as a % of GDP, Austria was ranked in 21st position amongst the EU-28 in 2012. Austria was ranked in a similar (23rd) position regarding the % of GDP generated by pollution and resources taxes. Compared to other EU MS, and as a share of GDP, Austria has a relatively high level of revenue generation from transport taxes (excl. transport fuels) (7th highest in 2012).[66]

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[64] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[65] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

[66] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Table 11: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	17
Energy Taxes as a Share of GDP (%)	21
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	7
Pollution & Resource Taxes as a Share of GDP (%)	23

Source: based on Eurostat data

6.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax, as well as full references, are given in the Appendix. This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[67,68]

- **Energy:** The Austrian excise duties on fuels and electricity are shown in Table 24, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 12: Standard Rates of Excise Duties on Fuels and Electricity in Austria

Excise Duty	Unit	Rate Applied in Austria	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol[1]	€ per 1000 litres	€554 - €587	€421	€580	€583
Unleaded Petrol[1]	€ per 1000 litres	€482 - €515	€359	€536	€515
Gas Oil (Diesel)[1]	€ per 1000 litres	€397 - €425	€330	€425	€412
Kerosene	€ per 1000 litres	€397	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	€261	€125	€197	€176
Natural Gas	€ per GJ	€1.66	€2.60	€2.94	€2.60

[67] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[68] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Austria	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)[1]	€ per 1000 litres	€397 - €425	€21	€233	€242
Kerosene	€ per 1000 litres	€397	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	€261	€41	€134	€125
Natural Gas	€ per GJ	€1.66	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)[1]	€ per 1000 litres	€98 - €128	€21	€178	€122
Kerosene	€ per 1000 litres	€397	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	€60	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	€43	€0.00	€78	€42
Natural Gas	€ per GJ	€1.66	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€1.70	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel) [1]	€ per 1000 litres	€98 - €128	€21	€185	€123
Kerosene	€ per 1000 litres	€397	€0.00	€275	€330
Heavy Fuel Oil	€ per 1000 kg	€60	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	€43	€0.00	€110	€43
Natural Gas	€ per GJ	€1.66	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€1.70	€0.30	€1.69	€0.32
Electricity					
Business Use	€ per MWh	€15	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	€15	€1.00	€14.68	€1.91

Notes:

1. The lower rate of the range given applies for fuel with biofuel content and/or with a low sulphur content. The higher rate applies for all other fuels.

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- All excise duty rates in Austria are taxed above the minimum set out in the ETD. About half of the rates are also above the EU-28 average. This is particularly the case for industrial and commercial fuels, as Austria's excise duties are the same for all motor fuels, regardless of whether they are for propellant use or industrial and commercial use. Some Member States set lower rates for industrial and commercial use, as can be seen by the lower average and median values for that category. Similarly, Austria has one rate for all heating fuels, regardless of whether they are intended for business or non-business use, whereas some Member States apply a lower rate for business use for some fuels (including, Germany, Spain Italy and Sweden).
- Austria applies two bands of rates for gas oil and petrol with a certain level of biofuel content and/or which are low-sulphur. These rates are explained fully in the Appendix. Pure biofuels are exempted from the excuse duty.
- Energy Tax reimbursements: Austria reimburses companies whose main activity is the production of goods for taxes paid on electricity, and when natural gas, coal or mineral oil is used for heating purposes, when the total cost of the energy is above 0.5% of the company's turnover. The company must, as a minimum, pay the rates equal to the minimum rates set by the ETD.
- Revenue in 2012 from mineral oil excise duties was €4.2 billion, equivalent to 1.4% of GDP. Revenue in 2012 from duties on electricity, coal and natural gas was €831 million, equivalent to 0.27% of GDP.[69]

➢ **Transport (excl. transport fuels):**

- Registration tax:
  - All passenger cars and motorcycles are required to pay a duty on vehicles based on fuel consumption ("Normverbrauchsabgabe" ["NoVA"]) at the time of purchase.[70] The tax is based on the net purchasing price of the vehicle as well as its fuel consumption. The tax is added to the vehicle price at the time of purchase and VAT is paid on both the net purchasing price and the vehicle duty. In addition, a bonus/malus system applies to take account of vehicles' NO_x and CO_2 emissions. Some exemptions apply, including to electric vehicles. Revenue from "NoVa" in 2012 was €505 million, equivalent to 0.17% of GDP.
  - In addition to "NoVa", there is a further car registration tax for all vehicles ("Kraftfahrzeugszulassungssteuer"). This is a flat-rate tax collected by the

[69] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[70] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=16/1357119635&taxType=Other+indirect+tax

central government. The rate in 2013 is €119.80 per vehicle. Revenue in 2011 (the latest year for which figures are available) was €172 million (equivalent to 0.06% of GDP).[71]

- Circulation taxes:
  - There are two mandatory circulation taxes on vehicles in Austria. Motor Vehicles Tax 1 ("Kraftfahrzeugsteuer") is a monthly tax on vehicles with a total weight of more than 3.5 tonnes as well as on smaller vehicles that have no mandatory third-party insurance (vehicles with mandatory third-party insurance are covered by Motor vehicles tax 2, described below). For vehicles with a total weight of less than 3.5 tonnes, rates are based on the engine power (expressed in kW). Vehicles with more than 3.5 tonnes total weight are taxed based on their total weight. Exemptions apply for electric vehicles, vehicles used in official services such as ambulances, vehicles used by people with disabilities, taxis, buses and coaches.[72] Revenues from Motor Vehicles Tax 1 were €45 million (equivalent to 0.015% of GDP) in 2012.[73]
  - Motor Vehicles Tax 2 ("Motorbezogene Versicherungssteuer") is a monthly tax on vehicles subject to mandatory third-party insurance with a total weight of less than 3.5 tonnes, including motorcycles. As for Motor Vehicles Tax 2, rates are based on engine power and exemptions apply for certain vehicles, including electric vehicles.[74] Revenues in 2012 from Motor Vehicles Tax 2 were €1.7 billion (equivalent to 0.55% of GDP).[75]

According to data presented by Eurostat, households pay a high proportion of transport tax (more than 75% in 2010).[76]

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[71] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[72] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=14/1329868800&taxType=Other+indirect+tax

[73] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[74] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=15/1357119635&taxType=Other+indirect+tax

[75] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[76] See Figure 12 in European Commission (2013) *Environmental Taxes - Detailed Analysis*, Accessed 13 December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Environmental_taxes_-_detailed_analysis

- Aviation Taxes:
    - The flight charge ("Flugabgabe") is a tax paid per passenger on flights departing from within Austria. Three rates are charged, depending on the destination of the flight. This tax was introduced in 2011 and rates were lowered in 2012. Rates applicable in 2013 were as follows: [77]
        - Short haul flight: €7.00 / passenger
        - Medium-haul flight: €15.00 / passenger
        - Long-haul flight: €35.00 / passenger

      Revenue in 2012 was €107 million (equivalent to 0.035% of GDP).[78]
- Additionally, Austria has a road toll system in place, which charges vehicles (both passenger cars and heavy goods vehicles) for the use of certain parts of the road network. Together, these systems generated around €1.5 billion in 2012. [79]

➢ **Pollution and resources:**

- The Altlastensanierungsgesetz or ALSAG, is an Act which was passed whose purpose was to finance the remediation of contaminated sites, typically, those which had been abandoned. The means of financing this has been, effectively, a landfill tax. Rates are charged per tonne of material deposited in a landfill and are set based on the environmental impact of the material. This tax is paid at the national level.[80] The landfill tax for municipal waste (€87.00 per tonne) is more or less redundant owing to the restriction on landfilling of waste in Austria: waste cannot be landfilled unless it has undergone treatment to reduce fermentability of the waste, and residues from such processes can, where certain conditions are met, be landfilled at a rate of €29.80 per tonne. The tax also applies to incineration of waste (collected as part of the landfill tax since 2006 and now at a rate of €8/tonne). It applies also to waste which is transported outside Austria for incineration.
- Austria has a levy on landscape protection and nature conservation, which includes charges on the extraction of aggregates. The types of materials covered, and the applicable rates, are set regionally, however. For example, in Lower

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[77] Bundesministerium für Finanzen (Federal Ministry of Finance) (no date) *Flugabgabe (Flight Charge)*, Accessed 24 January 2014, https://www.bmf.gv.at/steuern/a-z/flugabgabegesetz/flugabgabe.html

[78] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[79] Statistik Austria (2012) Umweltgesamtrechnungen Modul Öko-Steuern (Zeitreihe 1995 bis 2011), Projektbericht

[80] ECT/SCP (2013) *Municipal Waste Management in Austria*, Report for European Environment Agency, February 2013, pp. 12 - 14, http://www.eea.europa.eu/publications/managing-municipal-solid-waste/austria-country-paper-on-municipal.

Austria, extraction of gravel, sand and ballast is charged at €0.194 per tonne. Revenues in 2012 amounted to €9 million (equivalent to 0.003% of GDP).

- Additionally, Austria has a number of other pollution and resource taxes in place, including a tax on land, and hunting and fishing duties. These are described in more detail in the Appendix.

➢ Several "ecologically relevant payments" also exist in Austria. These are related to the use of resources and are listed below. These are, correctly speaking, not taxes, but user charges (see Introduction above).

- Rates for water charges are set by municipal governments in Austria and vary considerably across the country. Groundwater rights are related to land ownership, whereas abstraction from surface waters is strictly regulated. Agricultural use of water is charged on the basis of a volumetric element, and a flat rate based on the area used for crops. Charges include a connection fee ("Anschlussgebühr") and a user fee which depends on the amount of water used.[81] Additionally, a wastewater surcharge has been implemented in some municipalities. Such charges must be below a specified federal regulatory limit.[82]
- Examples for water charges (excl. VAT) are:
  - Vienna €1.64/m^3 plus €24.15 to €289.75 fee for water meters per year;[83]
  - Graz €1.628/m^3 plus €61.2 to €1,075 maintenance costs per year, depending on diameter of water pipeline;[84]
  - Salzburg €1.468/m^3 plus €23.4 to €58.08 fee for water meters per year;[85]
  - St. Pölten €1.19/m^3 plus €4.20 per m^3/hour fee for water meters per year.[86]

  In 2011 (the latest year for which figures were available), revenues from water charges were €422 million (equivalent to 0.14% of GDP). [87]
- In addition there are also different rates, and different tax bases, on a local level for waste water services e.g.:

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[81] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Austria*, Report for European Commission - DG Environment, July 2013, page 8.

[82] OECD (2013) *OECD Environmental Performance Reviews: Austria 2013*, 2013, page 90.

[83] http://www.wien.gv.at/amtshelfer/bauen-wohnen/wasserwerk/wasseranschluss/wassergebuehr.html

[84] http://www.holding-graz.at/wasserwirtschaft/gebuehrenentgelte-preise/wasserpreise.html

[85] http://www.salzburg-ag.at/wasser/zahlen-fakten/

[86] http://www.landeshauptstadt.at/index.php?option=com_content&view=article&id=121&Itemid=123

[87] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

- Vienna €1.79/m³[88]
- Graz €20.7/m² living space sewage maintenance costs plus €178 for up to 120m³ water consumption per toilette[89]
- Salzburg €2.25/m³ water consumption[90]
- St. Pölten €1.36/m² living space[91]

In 2011 (the latest year for which figures were available), revenues from wastewater charges were €1.1 billion (equivalent to 0.36% of GDP).[92]

- A number of environmentally harmful subsidies have been identified from work undertaken by IEEP, OECD and GWS, and from Excise Duty Tables.[93,94,95,96] Subsidies for which revenues forgone/amounts spent are available are listed in Section 6.2.2. The main subsidies can be summarised as follows:
  - Energy tax refund for energy intensive industries
  - Energy tax relief for gas oil used for powering combined heat and power plants
  - Reduced company car taxation

6.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Austria. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as the basis for how the calculation of revenue generation. Outturns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

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[88] http://www.wien.gv.at/amtshelfer/bauen-wohnen/wasserwerk/wasseranschluss/abwassergebuehr.html

[89] http://www.holding-graz.at/wasserwirtschaft/gebuehrenentgelte-preise/abwassergebuehren-und-entgelte.html

[90] http://www.stadt-salzburg.at/internet/politik_verwaltung/steuern/abgaben_a-z/hausbesitzerabgaben/kanalbenuetzungsgebuehr_389295.htm

[91] http://www.st-poelten.gv.at/Content.Node/buergerservice/abgaben_baupolizei.php#Kanalben%C3%BCtzungsgeb%C3%BChr

[92] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[93] See Table 3 in IEEP (2013) *Steps to Greening Country Report: Austria*, Report for the European Commission, p.9.

[94] *DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

[95] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 67 - 73, dx.doi.org/10.1787/9789264187610-en

[96] Ökosozialen Forum Österreich (2013) *Modellierung und Simulierung einer ökosozialen Steuerstrukturreform in Österreich [Modeling and simulation of a socio-ecological tax structure reform in Austria]*, Spring 2013

6.2.1 Current Status of EFR

Since mid-December 2013, Austria has a new government – a coalition of the Social Democrats (SPÖ) and the Conservative Party (ÖVP). The intergovernmental agreement does not provide for an environmental fiscal reform programme, but it proposes a) an increase in the standard fuel consumption tax on vehicles (NOVA), b) an increase in the engine-related insurance tax and c) a change of regulations and tax expenditures for the private use of company cars.

In both parties, relevant interest groups are opposing higher energy taxes (especially the economic wing within ÖVP and Chamber of Labour and trade unions within SPÖ – both of them arguing for different client interests). There are, however, plans to establish a task force to work on fiscal reform. Economists (especially those at the Austrian Institute of Economic Research) and several NGOs argue in support of an environmental tax reform, but there is no strong political movement in support of this approach.

The austerity package of 2011 included the introduction of a flight levy (short distance €8, middle distance €20, long distance €35), an increase in the mineral oil tax on diesel (of €0.05/litre) and petrol (of €0.04/litre) and an adjustment of the car registration tax: on the one hand, the carbon element of the tax was increased; on the other hand, the permissible limits for toxic emissions were reduced.

In the Stability Act of 2012, mineral oil tax reimbursement for agriculture and public transport was abolished (generating revenues of about €0.07-0.08 billion). The flight levy introduced in 2011 was reduced for competitive reasons (short distance €7, middle distance €15, long distance €35), and commuting allowances were raised (leading to additional budget losses of about €0.15 billion).

A government bill published on 9th of January 2014 proposes inter alia new rates for the engine-related insurance tax, the motor vehicle tax (< 3.5 tonnes) and the standard fuel consumption tax with additional revenues anticipated to be around €230 million in 2014 and €280 million as of 2015. [97,98] The proposed tax changes will be discussed in Parliament in the period between now and March 2014.

The above considerations reflect the country specific recommendation made as part of the 2012 European Semester:

> **Recommendation 3:** *[…] Reduce the effective tax and social security burden on labour for low-income earners in a budget-neutral way by relying more on other sources of taxation less detrimental to growth, such as recurrent property taxes.*

The shift towards environmental taxes is part of the reforms described below.

6.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

<u>Adjustments to existing taxes or new taxes:</u>

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[97] BMF (2014), AbgÄG 2014 - Gesetzestext - Begutachtungsentwurf https://www.bmf.gv.at/steuern/BegEntw_Ges_AbgAeG_2014_09_01_2014.pdf?46qit0

[98] BMF (2014) AbgÄG 2014 - Vorblatt - Begutachtungsentwurf https://www.bmf.gv.at/steuern/BegEntw_Vorblatt_AbgAeG_2014_09_01_2014.pdf?46qit0

- **Energy Taxes:**
  - It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO_2 price. Transport fuels are equalised using the energy content on petrol (€14.3/GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€10.6/GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate for natural gas of €0.54/GJ.
  - Table 13 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 13: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	515	515
Light fuel oil (diesel)	€/1000 litre	556	425
LPG (propellant)	€/1000 kg	717	261
Kerosene	€/1000 litre	559	397
Natural gas (prop)	€/GJ	15	2
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	425	425
Kerosene	€/1000 litre	428	397
LPG	€/1000 kg	547	261
Natural gas	€/GJ	12	2
BUSINESS HEATING			
Gas oil	€/1000 litre	128	128
Heavy fuel oil	€/1000 kg	83	60
Kerosene	€/1000 litre	397	397
LPG	€/1000 kg	83	43

	Units	Suggested Rates	Existing Rates
Natural gas	€/GJ	1.66	1.66
Coal	€/GJ	2.43	1.70
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	128	128
Heavy fuel oil	€/1000 kg	83	60
Kerosene	€/1000 litre	397	397
LPG	€/1000 kg	83	43
Natural gas	€/GJ	1.66	1.66
Coal	€/GJ	2.43	1.70
ELECTRICITY			
Electricity - business use	€/MWh	15.00	15.00
Electricity - non-business use	€/MWh	15.00	15.00

- **Transport Taxes:**
  - **Vehicles:** The taxes on transport in Austria are significantly higher than average in the EU (0.78% of GDP compared to the EU-28 level of 0.50% GDP). In addition, taxes on transport fuels are increased as a consequence of the suggestions above. However, it is suggested that additional revenue of 0.42% GDP could still be generated. Increasing vehicle taxation could both raise revenue, and also, increasing differentiation between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. In line with the proposals from the Commission of 2005, we suggest that the main increase could relate to the circulation tax ("Motorbezogene Versicherungssteuer"), with the basis for taxation shifting more towards the emissions performance of vehicles (which is now relatively common practice in the EU-28). There is also the potential in Austria for an increase in HGV toll charges, city tolls and a switch from the "Vignette"/ Motorway toll sticker to a general toll for cars (with the first step covering highways, and subsequently, other areas, but with lower rural rates). As noted above, some of these types of tax appear to be already under discussion within Austria. The increase is phased in over the period from 2015 to 2020.
  - **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Austria already has an aviation tax on all passenger flights, and as noted

above, these were reduced in 2012.[99] There is scope for increasing passenger flight taxation rates, and for introducing a tax on air freight. The suggested rates for the air passenger tax for are €15 per passenger (flights within the country concerned), €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

- **Pollution and Resource Taxes:**
  - **Aggregates:** There is currently no tax on aggregates in Austria on a national level. However, there are different levies with different rates at a regional level, as mentioned above (and described in the Appendix). The average rate is calculated as €0.09 per tonne extracted. An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in-line with the flagship initiative 'A Resource Efficient Europe'.[100] It is suggested that regional rates set by the levy on landscape protection and nature conservation are set at €2.40 per tonne from 2016, and that thereafter, they are kept constant in real terms. The types of materials that could be covered by the tax are:
    - Marble;
    - Chalk and dolomite;
    - Slate;
    - Limestone and gypsum;
    - Sand and gravel.

    Not all of these are extracted in Austria. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues;
  - **Waste – incineration / MBT tax:** There are currently thirteen incinerators operating in Austria, and there is an incineration tax of €8 per tonne in place.[101] Moreover there are several MBT plants used to prepare wastes for subsequent energy recovery, and for stabilising wastes before landfilling. In order to ensure that recycling rates do not stagnate, and to generate some additional revenue, it is

[99] Bundesministerium für Finanzen (Federal Ministry of Finance) (no date) *Flugabgabe (Flight Charge)*, Accessed 24 January 2014, https://www.bmf.gv.at/steuern/a-z/flugabgabegesetz/flugabgabe.html

[100] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[101] CEWEP (2014) *Waste-to-energy in Europe in 2011*, Accessed 1st February 2014, http://www.cewep.eu/information/data/studies/m_1167

suggested that the incineration tax could be increased, to €15 per tonne, in 2020, and that rates are set so that other forms of residual waste treatment are taxed in an equivalent manner.

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied to all packaging placed on the market in Austria:
    - Aluminium €197 per tonne
    - Plastic €64 per tonne
    - Steel €54 per tonne
    - Paper and card €20 per tonne
    - Glass €18 per tonne
    - Wood €13 per tonne

  These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax**: There is currently no tax on single-use carrier bags in Austria. Of these bags, plastic bags in particular cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover in countries with high level of tourism littered plastic bags can deter visitors. A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[102] Consequently, it is suggested that Austria implements a tax on single-use carrier bags at a rate of €0.11 per bag from 2016, and maintains the rate constant in real terms thereafter.

- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to Airbase (EEA) 89.7% of the urban population in Austria is exposed to PM_{10} concentrations exceeding the daily limit value (50 µg/m^3) for over 35 days per year.[103] Austria does not currently have a system of air pollution

[102] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[103] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014,

taxes in place. It is suggested that an air pollution tax could be implemented in order to generate improvements in air quality as follows:

- SOx €1,000 per tonne
- NOx €1,000 per tonne
- PM10 €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2015 to maximum levels by 2020. The rates are then held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*. The OECD estimates that water charges cover 85% of annual costs to municipalities for providing water services (households contribute 70-75%, industry 20-25% and agriculture 2-5%).[104] Currently, although there are user charges in place (around €1,500 per 1,000m^3 depending on the area) there are no taxes for abstraction in Austria. It is suggested that appropriate levels of taxation would be of the order €150 per 1,000m^3 for the public water supply, €90 per 1,000 m^3 for manufacturing purposes and €12.5 per 1,000 m^3 for agriculture. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. We note that there might be, in Austria, some issues associated with implementing this system in the context where charge rates already vary significantly in structure, and in the rate at which they are applied, on a regional basis. One option would be for revenues above cost recovery levels to accrue to the national budget. This would require understanding of what acceptable levels of cost recovery are (allowing for proper maintenance of the resource as appropriate), and it would also, ideally, require incentives, at the margin, to be reflected in levy structures. A transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[105] Austria has waste water user charges, but not a waste water tax. As with abstraction, these vary in level and structure on a regional basis. To improve prevention of water pollution it is

http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

[104] OECD (2013) *OECD Environmental Performance Reviews: Austria 2013*, 2013, page 90.

[105] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

suggested to implement a waste water tax and adjust tax rates in-line with 'good practice'. With relative price levels in Austria this would imply, for BOD, a rate of €2.47 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  Austria's Action Plan is a compilation of the Plans of the nine Länder. In the Action Plan of Vorarlberg, in a response to a stakeholder view, regarding "application of the polluter pays principle and introduction of a 'pesticide levy'", the Plan notes, "*The introduction of such a levy is not possible in the Land without the involvement of the Federal Government (similarity to turnover tax).*"[106] A tax would, we understand, be a matter for federal Government. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Austria. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan.

- **Fertilisers**: Austria does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of 0.2 € per kg N be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful identified in previous studies are listed in Table 14.

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[106] See *National Action Plan Plant Protection Products: Austria, Compilation of the Plans of the Land Action Plans of the Nine Länder*, p.202, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_austria_en.pdf

- An example of an environmentally harmful subsidy in Austria is the private use of company cars, which is significantly subsidised in several member states, including Austria. This promotes the over-use of such cars through reducing the marginal costs of driving. Austria has made the welcome step of no longer entitling employees, using a company car for private purposes, to commuting allowances.[107] However, there is still scope to improve the treatment of company cars, possibly by linking to vehicles' emission levels, as is done in the United Kingdom.
- An environmentally harmful subsidy for which the amount involved was not identified by any sources is the promotion of traffic infrastructure in rural areas.[108]

Table 14: Environmentally Harmful Subsidies – Amounts Involved

Subsidy	Amount involved (€ million, real 2013 terms)
ENERGY	
Energy tax refund for energy intensive industries	294[1] - 341 [2]
Energy tax relief for gas oil used for powering combined heat and power plants	
TRANSPORT (excl. transport fuels)	
Reduced company car taxation	300 [3]
POLLUTION & RESOURCES	
Promotion of the construction of new single family houses	180 to 270[2]
Total	774 - 911

Notes:

1) *Amount involved stated in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 67 - 73, dx.doi.org/10.1787/9789264187610-en*
2) *Amount involved stated in: Table 3 in IEEP (2013) Steps to Greening Country Report: Austria, Report for the European Commission, p.9.*
3) *Amount involved stated in: Ökosozialen Forum Österreich (2013) Modellierung und Simulierung einer ökosozialen Steuerstrukturreform in Österreich [Modeling and simulation of a socio-ecological tax structure reform in Austria], Spring 2013*

[107] OECD (2011) *Environmental Performance Reviews: Austria 2013,* 2013, p.83, http://dx.doi.org/10.1787/978926202924-en

[108] See Table 3 in IEEP (2013) *Steps to Greening Country Report: Austria*, Report for the European Commission, p.9.

6.2.3 Summary of Revenue Outcomes

Table 15 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 15: Potential Additional Revenue from Environmental Fiscal Reform in Austria, million EUR (real 2013 terms)[109]

Type	2016	2020	2025
Energy			
Transport fuels	106	519	820
C&I / Heating	2	12	18
Sub-total Energy, million EUR	108	531	839
Sub-total Energy, % GDP	0.03%	0.15%	0.22%
Transport (excl. transport fuels)			
Vehicle Taxes	274	1,474	1,611
Passenger Aviation Tax	371	780	849
Freight Aviation Tax	0.14	0.27	0.28
Sub-total Transport, million EUR	646	2,254	2,460
Sub-total Transport, % GDP	0.19%	0.63%	0.63%
Pollution and Resource			
Incineration /MBT Tax	12	18	19
Air Pollution Tax	36	76	77
Water Abstraction Tax	99	237	249
Waste Water Tax	27	38	38
Pesticides Tax	17	31	31
Aggregates Tax	234	142	149

[109] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Packaging Tax	41	41	44
Single Use Bag Tax	47	10	11
Fertiliser Tax	0.009	0.017	0.016
Sub-total Pollution & Resource, million EUR	512	593	618
Sub-total Pollution & Resources, % GDP	0.15%	0.17%	0.16%
Total Environmental Taxes			
Total, million EUR	1,266	3,378	3,917
Total Increase, % GDP	0.38%	0.95%	1.01%
Total Environmental Harmful Subsidies			
Total, million EUR	843	843	843
Total Saving, % GDP	0.26%	0.26%	0.25%
Total Potential for Environmental Fiscal Reform			
Total, million EUR	**2,108**	**4,220**	**4,759**
Total Increase, % GDP	**0.65%**	**1.21%**	**1.26%**

6.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, EUR 436 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to a significant increase in the tax rate for coal use for heating, and the resultant fall in demand for coal.

Table 16: Monetised Environmental Benefits from Implementation of Taxes, million EUR (real 2013 terms)

Tax Type	2016	2020	2025
Energy	6	28	43
Transport	25	71	72
Pollution & Resources	85	309	320
Total, million EUR	115	409	436
Total, % GDP	0.04%	0.12%	0.12%

6.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Austria:[110]

- In 2012 environmental taxes generated revenue equivalent to 2.44% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Austria. These could generate **€1.3 billion** in 2016, rising to **€3.9 billion** in 2025 (both in real 2013 terms). This is equivalent to **0.38%** and **1.01%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be in the vicinity of **€0.84 billion**, or **0.26%** of GDP in 2016.
- The largest single contribution comes from suggested changes in vehicle taxation. This accounts for **€2 billion** by 2025 (real 2013 terms), equivalent to **0.42%** of GDP. Some proposals have already been announced in this respect, and it is hoped that they would, if implemented, generate revenues of this order of magnitude.
- Suggested increased rates under the existing tax on passenger flights are the next largest contributor generating **€1.6 billion** by 2025 (real 2013 terms), equivalent to **0.34%** of GDP. The revenue is split almost equally between intra-EU and extra-EU flights. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- Following harmonisation, in line with the proposed ETD, of rates for transport fuels with the current rate for petrol, additional revenue of **€0.8 billion** by 2025 (real 2013 terms),

[110] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

equivalent to **0.17%** of GDP, is estimated. This implies an increase in the tax rate for gas oil (diesel).

- The suggested water abstraction tax generates estimated revenue of **€0.2 billion** by 2025 (real 2013 terms), equivalent to **0.05%** of GDP.
- In addition, minor taxes on, *inter alia*, air pollution, waste water and pesticides, could generate revenue of **€0.4 billion** by 2025 (real 2013 terms), equivalent to **0.08%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **€0.4 billion** in 2025 (real 2013 terms), or **0.12%** of GDP.
- In the context of the European Semester in 2012, the European Commission made a recommendation, including the following:
    - *Reduce the effective tax and social security burden on labour for low-income earners in a budget-neutral way by relying more on other sources of taxation less detrimental to growth, such as recurrent property taxes.*

The above package, or elements thereof, would clearly help to meet the objective in respect of environmental taxes.

7.0 Belgium

7.1 Country Overview

7.1.1 Key Facts about the Economy and Tax System

- Belgium's GDP grew steadily between 2004 and 2007, with an average annual growth rate of 2.95% in real terms. In 2008 GDP fell by 1.0% in real terms, followed by a sharper fall of 2.8% in 2009. A return to growth occurred in 2010 when GDP grew by 2.3% in real terms. This was followed by 1.8% growth in 2011, and a small fall of 0.1% in 2012.[111]
- In 2012, revenue from all taxes and social contributions stood at 47% of GDP, having risen steadily from a low of 45% in 2009.[112]
- The proportion of total tax revenue derived from direct taxes in 2012 (37%) was roughly similar to the proportion derived from social contributions (36%). The remaining revenue (27%) was generated through indirect taxes.[113]
- In 2012 (the latest year for which Eurostat data on revenues from environmental taxes are available), environmental taxes in Belgium accounted for 2.16% of GDP. Between 2001 and 2004, the share of environmental taxes increased by 0.1% GDP, and then began to decline steadily. This value reached a low of 2.12% GDP in 2008, before increasing over the next three years to 2011, but then falling back slightly in 2012.[114]
- In 2012, the majority of environmental tax revenue was from energy taxes, 1.28% of GDP, with smaller contributions coming from transport taxes (excl. transport fuels), 0.74% of GDP, and pollution and resources taxes contributing 0.14% of GDP. The revenue share from pollution and resources taxes has shown a decline from a high of 0.22% of GDP in 2004 to a low of 0.14% of GDP in 2012. [115] The decline in pollution and resource tax revenues has resulted, amongst other things, from a reform of the Flemish water levy between 2004 and 2006 (with the levy being converted, in part, to a charge, leaving a smaller 'tax' element), and from the significant reduction in waste landfilled and incinerated as a result of successful waste management policies.

7.1.2 Relative Position within the EU

- In 2012, expressed as a proportion of GDP, revenue from environmental taxes was below the EU-28 level of 2.29% GDP. Revenue from energy taxation was also below the EU-28 level of 1.79% of GDP. Revenue from transport taxes (excl. transport fuels) and

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[111] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[112] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

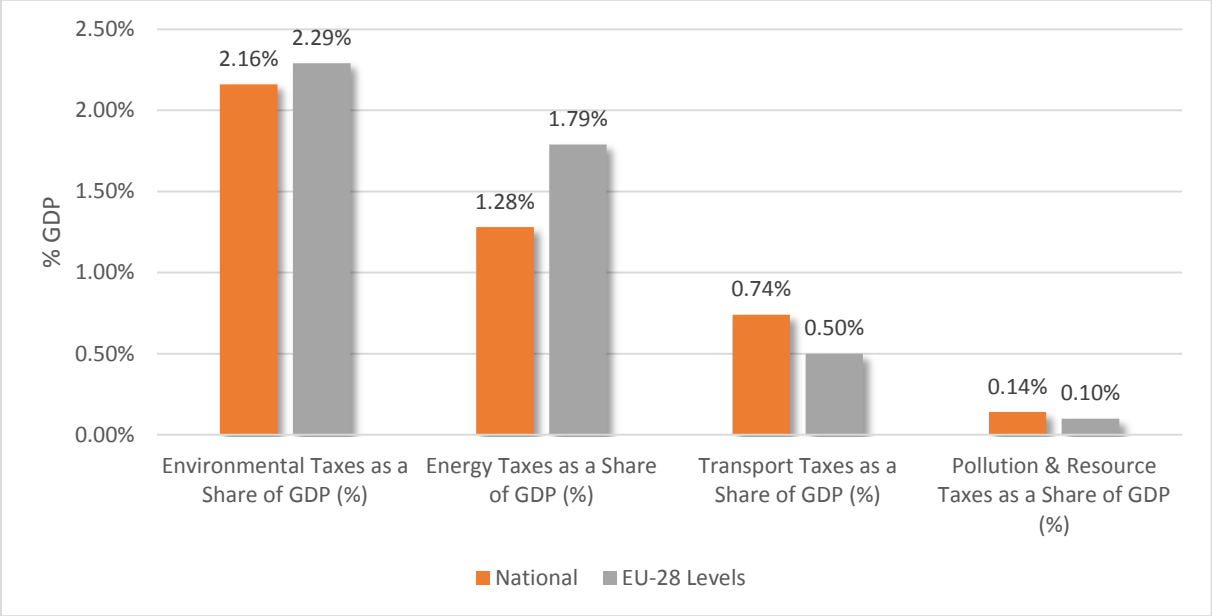
[113] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[114] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[115] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

pollution/resource taxes were both slightly higher than the levels for the EU-28 of 0.50% and 0.10%, respectively (see Figure 2).[116]

Figure 2: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

- Expressed as a percentage of GDP, and relative to the EU-28, revenues from environmental taxation in Belgium ranked 23rd. Revenues from energy taxation ranked 27th. Taxes on transport (excl. transport fuels) ranked 9th, whilst taxes on pollution and resources were also ranked in 9th place (see Table 17).[117]

Table 17: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	23
Energy Taxes as a Share of GDP (%)	27
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	9
Pollution & Resource Taxes as a Share of GDP (%)	9

Source: based on Eurostat data

[116] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[117] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

7.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax are given in the Appendix (this Appendix also includes a detailed list of references for all of the information cited in this section). This section summarises key aspects of the main environmental taxes, and, for energy, how the rates compare with European averages, and with the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[118,119]

- **Energy:** The Belgian excise duties on fuels and electricity are shown in Table 18 (in this table ranges are presented where there are detailed banding or exemptions, see Appendix for full details) alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 18: Standard Rates of Excise Duties on Fuels and Electricity in Belgium

Excise Duty	Unit	Rate Applied in Belgium	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	€638	€421	€580	€583
Unleaded Petrol	€ per 1000 litres	€571 to €629	€359	€536	€515
Gas Oil (Diesel)	€ per 1000 litres	€406 to €443	€330	€425	€412
Kerosene	€ per 1000 litres	€627	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	€0	€125	€197	€176
Natural Gas	€ per GJ	€0	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil	€ per 1000 litres	€23	€21	€233	€242
Kerosene	€ per 1000 litres	€23	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	€44	€41	€134	€125
Natural Gas	€ per GJ	€0	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil	€ per 1000 litres	€17 to €18	€21	€178	€122

[118] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[119] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Belgium	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	€19	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	€16	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	€18 to €19	€0.00	€78	€42
Natural Gas	€ per GJ	€0.27[1]	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€0.45[2]	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil	€ per 1000 litres	€17 to €18	€21	€185	€123
Kerosene	€ per 1000 litres	€19	€0.00	€275	€330
Heavy Fuel Oil	€ per 1000 kg	€16	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	€18 to €19	€0.00	€110	€43
Natural Gas	€ per GJ	€0.27[1]	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€0.45[2]	€0.30	€1.69	€0.32
Electricity					
Business Use	€ per MWh	€1.9[3]	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	€1.9[3]	€1.00	€14.68	€1.91

Notes:

1. Converted from €0.9889 per MWh

2. Tax rate converted from MWh to GJ based on an energy intensity of 38.7597 kg per GJ.

3. Highest rate.

Source: Belgian Federal Public Service Finance (2013) T5 Tax Survey, Nr. 25 (update) 2013, *October 2013, http://docufin.fgov.be/intersalgen/thema/publicaties/memento/pdf/TS2013_V10_entire.pdf, p. 234-241.*

- The ranges in tax rates shown in the above table imply that there are exemptions in place for the given fuel or that there are different rates depending, for example, on the sulphur content of the fuel. The exemptions are typically given to energy intensive and non-energy intensive businesses which have an environmental objectives agreement, or arrangement, in place (see Appendix for full list of exemptions and tax rates).[120] There are a number of cases where the upper tax

[120] Several of these are with sectors covered by the EU-ETS.

rates are at, or above, the minimum suggested in the existing Energy Taxation Directive. However, many of the exemptions are at rates below the suggested minimum levels.

- In comparison to the European average and median tax rates across the EU-28, it is evident that many of Belgian's excise duties are well below the levels being applied in other Member States.
- Revenues in 2012 from energy excise duties listed in Table 18 amounted to €4.9 billion (equivalent to 1.3% of GDP).[121]

➢ **Transport (excl. transport fuels):**

- A registration tax is levied on the entry, or re-entry, of vehicles into service on public roads for the first time (i.e., Belgium's registration tax has an unusual feature in that it applies to both purchases both of new, and second-hand cars). The basis of assessment for the tax varies across the three regions. The Walloon region, for example, uses a system which includes the ecobonus and ecomalus schemes. An ecobonus is granted, or an ecomalus is levied under certain circumstances. Both are due upon the entry of a new or used vehicle into service, with a rate dependent upon the emissions category of the vehicle. The tax rates for each type of vehicle are complex and further detail can be found in the Appendix.[122] Tax revenues in 2012 totalled €371 million for the whole of Belgium (equivalent to 0.10% of GDP).
- An annual motor vehicle tax is levied on all motor vehicles used for the carriage of passengers or goods by road. The tax rate varies according to the size and type of vehicle and the region (different exemptions also apply in each region). Tax revenues in 2012 totalled €1,521 million (equivalent to 0.40% of GDP).
- The Eurovignette consists of a levy on motor vehicles and combinations of vehicles which are exclusively used for the transportation of goods by road and whose maximum authorized mass is at least 12 tonnes. Rates are dependent on the number of axles as well as the emissions category of the vehicle. Tax revenues in 2012 totalled €114 million (equivalent to 0.03% of GDP).

➢ **Pollution and resources:**

- Taxes on both landfilling and incineration are in place in Flanders and Wallonia, whilst an incineration tax is being introduced in the Brussels Capital Region. Incineration tax rates are €8.18 per tonne for mixed residual waste in Flanders and €9.89 per tonne in Wallonia (the rate in Brussels is anticipated to be €6.00 per tonne). Landfilling taxes vary across the two regions and are banded according to different waste streams, with a range of values for different waste streams. Landfill tax for non-hazardous residual waste in Flanders is currently (2014) €87.62 per tonne and in Wallonia it is slightly lower at €75.71 per tonne. Tax revenues in 2012 for all landfill and incineration taxes totalled €53 million (equivalent to 0.014% of GDP). The rate of

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[121] Revenues provided on request by the Department of the Federal Public Service Finance and GDP figure for 2012 taken from Eurostat (2013) *GDP and Main Components - Current Prices [nama_gdp_c],* Accessed 29th November 2013, *http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAMA_GDP_C*.

[122] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=38/1357119656&taxType=Other+indirect+tax

tax in Flanders is close to the upper end of the range in the EU, and considered relatively high by European standards.

- In Belgium beverage packaging is subject to a levy. The tax rate is €9.86 per hectolitre for non-reusable packaging, and €1.41 per hectolitre for reusable packaging. Tax revenues in 2012 totalled €318 million (equivalent to 0.085% of GDP).
- A number of disposable products are subject to an environmental levy, including plastic bags, disposable cutlery, and aluminium foils. Tax revenues in 2012 totalled €13.58 million (equivalent to 0.0036% of GDP).
- A regional tax applies to the disposal of wastewater, with different rates being applied in each region. Tax revenues in 2012 totalled €119 million (equivalent to 0.032% of GDP). As noted above, the Flemish region reclassified a significant proportion of the discharge tax as a charge between 2004 and 2006; this resulted in an apparent fall in tax revenues.
- All 'packaging responsible businesses' are collectively liable to pay an annual packaging prevention and management levy which is set at €0.53 per inhabitant. Strictly speaking, this is not an environmental tax. Revenues in 2012 totalled €3.22 million (equivalent to 0.0009% of GDP).
- Both Flanders and Wallonia have levies on the withdrawal of groundwater used for drinking purposes. This stands at €96 per 1,000 m^3 in Flanders and in Wallonia, it is set at €75.6 per 1,000 m^3 for potable water and between €24.8 per 1,000 m^3 and €74.4 per 1,000 m^3 for non-potable water (with abstractions below 3,000 m^3 being exempt).
- Flanders has a levy on the extraction of virgin gravel, and we are told there are local taxes on mines in Wallonia, but their nature was not divulged.

➢ A number of environmentally harmful subsidies have been identified from work undertaken by IEEP and OECD, and from Excise Duty Tables, supplemented with information from a peer reviewer.[123,124,125] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 7.2.2 (all subsidies are detailed in Appendix A.6.4). Examples of some of the main subsidies are as follows:

- Excise tax exemptions on products (mainly diesel fuel), for certain professional uses.
- Subsidies on company cars provided by employers are strongly encouraged by the current tax system. Employers consider company cars as cheap, non-wage compensation.[126]

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[123] See Table 4 in IEEP (2013) *Steps to Greening Country Report: Belgium*, Report for the European Commission, p.13.

[124] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 75 - 81, dx.doi.org/10.1787/9789264187610-en

[125] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity),* Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[126] IEEP (2012) *Study supporting the phasing out of EHS*, October 2012, http://ec.europa.eu/environment/enveco/taxation/pdf/report_phasing_out_env_harmful_subsidies.pdf

7.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Belgium. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as the basis for the calculation of revenue generation. Outturns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

7.2.1 Current Status of EFR

Belgium's fiscal landscape is extremely complicated after four decades of state reforms and transferral of powers from the federal to the regional level (i.e. Flanders, Wallonia, and the Brussels Capital Region). Most, but by no means all, energy taxes are set at the federal level, with transport, pollution and resource taxes typically being set, and implemented, at the regional level. With the vast majority of powers related to energy taxation, labour taxation, and income taxation still concentrated at the federal level, the Belgian federal government still has the tools (and the power) to determine the extent of EFR, given the extent to which environmental tax revenues depend on revenues from energy taxation.

Although there have been a number of attempts to push EFR higher up the political agenda, most efforts have failed to create significant impetus and debate at the federal government level. However, whilst a wide ranging and explicit EFR has not been implemented, and whilst there is no strong suggestion that such a change is imminent, different policy levels within Belgium have independently adopted a number of fiscal reforms which can be regarded as steps towards greener fiscal policies. For example, car purchase taxation in the Flemish and Walloon regions has been subject to reform, with environmental (mainly CO_2) considerations being integrated into the design of the tax.

Unfortunately, in the area of energy taxation, potentially the most important areas for EFR, no significant steps at reform have been taken over the past two years. Fuel taxes, for example, have remained unchanged in nominal terms since November 2011, implying a decline in the tax rates in real terms.[127] Electricity taxation has become increasingly complex since 2009 because of the introduction of several new (small) taxes, aimed at financing social and ecological policies. However, the total tax burden on electricity, which increased considerably between 2008 and 2011, has started to decline again in recent years. However, revenues from auctioning under the ETS may reverse this trend, but are not expected until 2013.[128]

Over the past three to four years the political debate about energy taxation has been overshadowed by the debate on the price of energy for consumers. Although the tax burden on energy has not increased in the past three years, several political parties and lobby groups are seeking to link price rises to levels of energy taxation. Following the drop in energy prices in 2013, the debate has slowly receded. However, in November 2013, the federal government decided to lower VAT on electricity from 21% to 6% as of 1st April 2014 as part of an economic re-launch programme. The potential negative environmental impacts of this measure were given

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[127] Bachus, K. (2013) Vergroening van het belastingstelsel in Vlaanderen: Actualisatie en Uitdieping, Studie Uitgevoerd in Opdracht van de Vlaamse Milieumaatschappij, MIRA, MIRA/2013/06, HIVA Onderzoeksinstituut voor Arbeid en Samenleving, KU Leuven. English Translation: Bachus, K. (2013) *Greening of the Tax System in Flanders: Update and In-depth Analysis*, Study Commissioned by the Flemish Environment Agency

[128] Personal communication with Dr Kris Bachus, Research Manager in Sustainable Development at University of Leuven, Leuven, Belgium.

limited consideration in the debate. Although VAT is not strictly included in the internationally agreed definition of an environmentally related tax, it is clear that this implicit subsidy, if it can be considered as such, could have significant environmental implications.[129]

In Flanders, we understand that Mira and the cell Environment-Economy has launched a study regarding the greening of taxation in Flanders, which analyses three different scenarios. The study will be finalized in June and will be officially presented in September

In the context of the European Semester in 2013, the European Commission made the following recommendations:

> **Recommendation 5:** *Establish concrete and time-specific proposals for shifting taxes from labour to less growth-distortive tax bases, notably by exploring the potential of environmental taxes, for example on diesel, heating fuels and the taxation of the private use of company cars. Simplify the tax system by reducing tax expenditures in income taxation, increasing VAT efficiency and improving tax compliance by closing existing loopholes.*
>
> **Recommendation 7:** *Take concrete measures and agree a clear division of efforts between the federal and regional authorities to ensure progress towards reaching the targets for reducing greenhouse gas emissions from non-ETS activities, in particular from transport and buildings.*

It is clear that Belgium's environmental tax revenue is falling relative to the size of the economy. There is an opportunity to increase revenues through EFR and, in line with the proposal in last year's semester, to reduce labour taxes as a result.

7.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

Adjustments to existing taxes or new taxes:

- **Energy Taxes:**
  - Energy tax rates have been harmonised within groups based upon the highest tax rate on energy content of any fuel used within a specific group (motor fuels, industrial and commercial motors, heating). Transport fuels are equalised using the energy content on petrol (€17.3/GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the minimum rate of €0.15/GJ as existing rates are low. The same applies for heating fuels. For electricity the exiting rate was assumed to be the higher of the four bands shown in (Table 152 in the Appendix).
  - Table 19 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by

[129] OECD (2001) *Environmentally Related Taxes in OECD countries: Issues and Strategies*, Paris: OECD Publishing, www.oecd.org/env/tools-evaluation/taxes.htm

2018 or 2023 depending on whether all of the existing rates are below €0.15/GJ or not.

Table 19: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Proposed Rates	Existing Rates
TRANSPORT FUELS-ENERGY			
Motor spirit (petrol)	€/1000 litre	614	614
Light fuel oil (diesel)	€/1000 litre	662	443
LPG (propellant)	€/1000 kg	855	0
Kerosene	€/1000 litre	666	627
Natural gas (prop)	€/GJ	18	0
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	57	23
Kerosene	€/1000 litre	56	23
LPG	€/1000 kg	65	44
Natural gas	€/GJ	1.3	0.0
BUSINESS HEATING			
Gas oil	€/1000 litre	57	18
Heavy fuel oil	€/1000 kg	68	16
Kerosene	€/1000 litre	56	19
LPG	€/1000 kg	65	19
Natural gas	€/GJ	1.27	0.27
Coal	€/GJ	2.04	0.45
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	57	18
Heavy fuel oil	€/1000 kg	68	16
Kerosene	€/1000 litre	56	19
LPG	€/1000 kg	65	19
Natural gas	€/GJ	1.27	0.27
Coal	€/GJ	2.04	0.45

	Units	Proposed Rates	Existing Rates
ELECTRICITY			
Electricity - business use	€/MWh	1.91	1.91
Electricity - non-business use	€/MWh	1.91	1.91

- **Transport Taxes (excl. transport fuels):**
  - **Vehicles:** The taxes on transport in Belgium are slightly above average relative to other Member States (0.74% of GDP compared to the EU-28 level of 0.50% GDP). Although vehicle taxes already exist in the three regions there is scope for raising these taxes as a means for raising revenue but also for further differentiating between vehicles based upon environmental performance in the case of the circulation taxes in particular. It is suggested that Belgium could increase vehicle taxation by 0.6% of GDP. It is suggested that the main changes could be in the circulation taxes, with these being differentiated according to the environmental performance of the vehicles. Given the issues associated with particulate emissions in urban areas, it is suggested that the environmental component includes particulate emissions as part of the tax base. The suggested increase is applied to future projections of real GDP in order to estimate revenue potential in future years. The increase is phased in over the period from 2015 to 2020.
  - **Aviation:** Currently there is no aviation tax in Belgium. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. It is therefore suggested that an aviation tax on air passenger flights and on air freight be introduced. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Belgium, €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.
- **Pollution and Resource Taxes:**
  - **Aggregates:** At present only Flanders has a tax on aggregates, which is currently set at €0.67 per tonne for valley gravel and €0.46 per tonne for mountain gravel. An aggregates tax helps reduce extraction rates for aggregates, and stimulates the market for the use of secondary materials. The instrument works well alongside taxes for landfilling of construction and demolition wastes. This

approach is aligned with the Roadmap to A Resource Efficient Europe.[130] It is therefore suggested that a tax be introduced in all regions where aggregates are being extracted or are likely to be extracted. A 'good practice' rate of €2.40 per tonne is proposed, where relevant, for each of the following materials:

- Chalk and dolomite
- Limestone and gypsum
- Slate
- Marble
- Sand and gravel

Not all of these are extracted in Belgium. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

It is suggested that the tax be introduced by 2016, after which it should be keep constant in real terms (either through annual changes, or periodic increases).

- **Waste – incineration / MBT tax:** The incineration taxes vary across both Flanders and Wallonia (and the rate to be applied in Brussels Capital Region) and are differentiated according to the waste stream being treated. These taxes could benefit from being equalised and extended. Slightly higher tax rates on incineration will not only encourage recycling in Flanders and Wallonia, but also in the Brussels Capital Region which lags significantly behind the other two regions and currently incinerates just under 80% of its waste.[131] It is suggested that the incineration tax is set at €15 per tonne in 2016. An equivalent rate is proposed for MBT facilities which are already operating in the country. These taxes should be kept constant in real terms once implemented. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe; [132]
- **Packaging:** In Belgium, as noted above, beverage packaging is subject to specific levy, whilst all 'packaging responsible businesses' are liable to pay an annual packaging prevention and management levy, set at €0.53 per inhabitant. Given that this tax is not directly related to the actual quantity of packaging placed on the market, and is therefore unlikely to incentivise waste prevention and innovation more broadly (but rather, fund activities of that nature), it is suggested that a direct tax be applied to packaging materials other than beverage packaging. It is suggested that the following rates could be applied:

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[130] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[131] European Environment Agency (2013) *Managing Municipal Solid Waste - A Review of Achievements in 32 European Countries: Municipal Waste Management in Belgium*, February 2013, www.eea.europa.eu/publications/managing-municipal-solid-waste, p. 16

[132] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

- Aluminium €197 per tonne
- Plastic €64 per tonne
- Steel €54 per tonne
- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax**: Plastic bags in Belgium are subject to an environmental levy of €3 per kg. An average single-use plastic carrier bag weighs 8.5g which means that there are approximately 118 bags per kg.[133] Thus this levy calculates out to be just under €0.03 per bag. Plastic bags cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the marine environment. As such, marine litter is specifically mentioned as a pressure in the Marine Strategy Framework Directive (2008/56/EC).[134] A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[135] Therefore, it is suggested that Belgium implements a tax on single-use plastic bags at a rate of €0.11 per bag from 2016, with the rate kept constant in real terms after this point.
- **Air pollution:** Belgium does not currently have a tax on air pollutants. The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality target which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. There have been significant improvements in air quality in recent years, particularly in relation to SO_x and NO_x, but there are still issues surrounding PM_{10} concentrations in urban

[133] BIO Intelligence Service (2011) *Assessment of Impacts of Options to Reduce the Use of Single-use Plastic Carrier Bags*, Report for DG Environment, European Commission, September 2011

[134] DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF

[135] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

areas.[136] According to Eurostat data, 45% of the country's urban population was exposed to the PM_{10} limit of 50 µg/m³ for more than 35 days in 2011 (the year for which most recent data is available).[137] Due to a number of high excedences over a number of years leading up to 2011 Belgium was referred to the European Court by the European Commission in April 2011.[138] Reflecting these concerns, it is suggested that Belgium introduce a tax on air pollution to generate additional improvements in air quality. The following rates are suggested:

- SOx €1,000 per tonne
- NOx €1,000 per tonne
- PM_{10} €2,000 per tonne

Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. Thereafter rates should then be held constant in real terms.

- **Water abstraction:** A central principle of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*, Flanders and Wallonia have introduced taxes on the abstraction of water for public use. In Flanders, the levy covers the withdrawal of groundwater which is used for drinking purposes and is set at €96 per 1,000 m³. In Wallonia, rates are €75.6 per 1,000 m³ for potable water and between €24.8 and €74.4 per 1,000 m³ for non-potable water, depending on use (with amounts below 3,000 m³ being exempted). However, in order to improve efficiency in the usage of the water supply system across Belgium it is suggested that this be extended to the abstraction of all water used for public supply, as well as for business. The suggested rate equates to €600 per 1,000m³ for water use in the public water supply, €360 per 1,000m³ for water use for manufacturing use and €50 per 1,000m³ for water use in agriculture. Given the magnitude of the suggested increase in rates, a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. It is suggested that the rate of tax is held constant in real terms once full implementation has been achieved.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and

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[136] IEEP (2013) *Member States' Achievements in Selected Environmental Policy Areas: Belgium*, Report for the European Commission, p. 33.

[137] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

[138] European Commission (2011) *Environment: Commission Takes Belgium to Court and Warns Romania over Failure to Comply with EU Air Quality Rules*, Published 4th April 2011, Accessed 21st January 2014, http://europa.eu/rapid/press-release_IP-11-435_en.htm?locale=en

discharges from certain industrial sectors.[139] Belgium has recently been convicted by the EU Court of Justice for allowing a number of towns to fail to comply with European norms, and been given a €10 million fine. Belgium has waste water charges with rates per unit of volume discharged, and for agriculture per unit of pollution (although no further details were obtained). To improve prevention of water pollution it is suggested to implement a waste water tax by type of pollutant and adjust tax rates in-line with 'good practice'. With relative price levels in Belgium this would imply a rate of €2.49 per kg BOD. For fresh-water discharges also phosphorus should be charged. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  "…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".

  Belgium has not yet published its National Pesticide Action Plan and there is currently no tax on pesticides in Belgium.[140] Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Belgium. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €17.50 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would support progress towards reduced reliance on pesticides in Belgium.

- **Fertilisers**: There is currently no tax on nitrogen (or other) fertilisers in Belgium. The Commission's report on the Implementation of Council Directive 91/676/EEC states that: *"As compared to 2008, the total area in the EU designated as [a nitrate] vulnerable zone has increased, with particular increases in Romania,*

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[139] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

[140] European Commission (2014) *National Action Plans*, Accessed 25th January 2014, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm

Belgium-Wallonia, Spain, Sweden, and the United Kingdom".[141] It is therefore suggested that a tax on the use of non-organic nitrogen in fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.35 per kg N be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study or previous studies, are listed in Table 32. Further details of our calculation methodology are available in Appendix A.6.4, in which we also present a full list of subsidies for which no figures for forgone revenues are available.

The sources described identify some subsidies which do not seem appropriate to include. These are:

- The subsidies to new car buyers to replace old cars. The environmental effects of such measures can be enhanced by the scheme's design, but it does not seem necessarily the case that this is environmentally harmful; and
- The excise tax exemptions for fuels used in electricity production are likely related to the inclusion of power generation within the ETS. This internalises, to a degree, the CO_2 emissions from power generation since allowances are not issued free to the power sector.

Table 20: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (€ million, real 2013 terms)
ENERGY	
Excise tax exemption for gas oil used for rail transport	28.9[1]
Excise tax exemption for fuels used in domestic navigation	19.1[2]
Excise tax exemption for the residential use of coal	16.4[2]
Degressivity of the federal contribution on electricity for large-quantity users	51.5[4]
Exemption for electricity production companies of the federal contribution on electricity, part (3) financing denuclearization	95.8[4]
Exemption for electricity production companies of the federal contribution on electricity, part (4) charge for federal climate politics	40[4]
Fuel-tax reduction for certain professional uses	2,000[5]
Fuel-tax reduction for certain industrial uses	151[5]
Fonds Social Mazout (Heating Oil Social Fund)	24[5]
Social tariff for natural gas	71[5]
Special heating grant	7[5]
TRANSPORT (excl. transport fuels)	

[141] European Commission (2013) Report from the Commission to the Council and the European Parliament on the Implementation of Council Directive 91/676/EEC Concerning the Protection of Waters Against Pollution Caused by Nitrates from Agricultural Sources Based on Member State Reports for the Period 2008–2011, p. 8

Subsidy	Amount involved (€ million, real 2013 terms)
Company car subsidies[142]	4,461[3]
Total	6,966

Notes:

1) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*
2) *Calculated based on exemption description in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 75 - 81, dx.doi.org/10.1787/9789264187610-en*
3) *Subsidy described in: Table 4 in IEEP (2013) Steps to Greening Country Report: Belgium, Report for the European Commission, p.13. Amount involved stated in: Table 3.6 in Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, p.28, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf*
4) *Personal communication with Kris Bachus, Research Manager in Sustainable Development at University of Leuven, Belgium, 24th January 2014*
5) *Amount involved stated in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 75 - 81, dx.doi.org/10.1787/9789264187610-en*

7.2.3 Summary of Revenue Outcomes

Table 21 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

[142] Peer reviewers have commented that for other countries the estimates of revenue losses from the favourable treatment of company cars in the tax system have been too high, so this figure must be treated with caution. However, given the suggested magnitude of the revenue savings it does not seem appropriate to omit it from the analysis.

Table 21: Potential Additional Revenue from Environmental Fiscal Reform in Belgium, million EUR (real 2013 terms)

Type	2016	2020	2025
Energy			
Transport fuels	153	751	1,186
C&I / Heating	186	546	546
Electricity	0	0	0
Sub-total Energy, million EUR	339	1,297	1,732
Sub-total Energy, % GDP	0.08%	0.31%	0.38%
Transport (excl. transport fuels)			
Vehicle Taxes	508	2,671	2,863
Passenger Aviation Tax	451	972	1,094
Freight Aviation Tax	0.70	1.49	1.64
Sub-total Transport, million EUR	960	3,644	3,959
Sub-total Transport, % GDP	0.24%	0.86%	0.87%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	0	0	0
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	16	16	16
Air Pollution Tax	43	80	68
Water Abstraction Tax	277	635	636
Waste Water Tax	30	41	41
Pesticides Tax	84	160	161
Aggregates Tax	256	150	146
Packaging Tax	59	60	65
Single Use Bag Tax	99	24	27
Fertiliser Tax	0.024	0.045	0.045
Sub-total Pollution & Resource, million EUR	863	1,167	1,161

Type	2016	2020	2025
Sub-total Pollution & Resources, % GDP	0.22%	0.28%	0.26%
Total Environmental Taxes			
Total, million EUR	2,162	6,108	6,852
Total Increase, % GDP	0.54%	1.45%	1.51%
Total Environmental Harmful Subsidies			
Total, million EUR	6,966	6,966	6,966
Total Savings, % GDP	1.79%	1.77%	1.74%
Total Potential for Environmental Fiscal Reform			
Total, million EUR	**9,128**	**13,074**	**13,818**
Total Increase, % GDP	**2.33%**	**3.21%**	**3.26%**

7.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, EUR 474 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reduced SOx, NOx and PM10 emissions from stationary sources and reductions in the use of natural gas and coal by industry.

Table 22: Monetised Environmental Benefits from Implementation of Taxes, million EUR (real 2013 terms)

Tax Type	2016	2020	2025
Energy	32	104	123
Transport	37	105	107
Pollution & Resources	61	281	243
Total, million EUR	130	490	474
Total, % GDP	0.03%	0.12%	0.11%

7.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Belgium:[143]

- In 2012 environmental taxes generated revenue equivalent to 2.16% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **€2.2 billion** in 2016, rising to **€6.9 billion** in 2025 (both in real 2013 terms). This is equivalent to **0.54%** and **1.51%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides. These are estimated to be **€7 billion** in 2016 (real 2013 terms), equivalent to **1.8%** of GDP, although the figure may be distorted somewhat by the high level of subsidy which is supposedly related to the favourable treatment of company cars within the tax system (see above).
- The largest single contribution comes from suggested changes in vehicle taxation. This accounts for **€2.9 billion** by 2025 (real 2013 terms), or **0.52%** of GDP. It was suggested that the main changes could be in the circulation taxes, with these being differentiated according to the environmental performance of the vehicles.
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **€1.2 billion** of additional revenue in 2025 (real 2013 terms), equivalent to **0.22%** of GDP.
- The suggested introduction of a tax on passenger flights could yield **€1.1 billion** by 2025 (real 2013 terms), equivalent to **0.20%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- The introduction of a water abstraction tax across the whole of Belgium could result in an additional **€0.8 billion** of revenue in 2025 (real 2013 terms), equivalent to **0.15%** of GDP.
- Following harmonisation, in line with the proposed ETD, of rates for fuels used by businesses for heating, additional revenue of **€0.6 billion** by 2025 (real 2013 terms), equivalent to **0.12%** of GDP, is estimated.
- In addition, minor taxes on, *inter alia*, pesticides, aggregates, air pollution, and packaging, could generate revenue of **€0.5 billion** by 2025 (real 2013 terms), equivalent to **0.20%** of GDP.

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[143] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **€0.5 billion** (real 2013 terms), or **0.11%** of GDP in 2025.
- In the context of the European Semester in 2013, the European Commission made the following recommendations:
    - *Establish concrete and time-specific proposals for shifting taxes from labour to less growth-distortive tax bases, notably by exploring the potential of environmental taxes, for example on diesel, heating fuels and the taxation of the private use of company cars.*
    - *Take concrete measures and agree a clear division of efforts between the federal and regional authorities to ensure progress towards reaching the targets for reducing greenhouse gas emissions from non-ETS activities, in particular from transport and buildings.*

  The measures suggested above, or similar instruments, would clearly help move matters in these directions..

8.0 Croatia

8.1 Country Overview

8.1.1 Key Facts about the Economy and Tax System

- Croatia's economy was relatively strong in the years leading up to the financial downturn. In 2007, the GDP growth rate in real terms was 5.1%. Croatia experienced the recession acutely, with a fall in GDP of 6.9% in real terms in 2009, and with GDP continuing to decline in real terms in the years to 2012.[144]
- In 2012, total revenue from environmental taxes amounted to 3.17% of GDP (8.86% of total tax revenue). The main contribution was from taxation on energy use.
- Energy taxes were 1.73% of GDP in 2012. Taxes on transport were equivalent to 0.80% of GDP, while pollution and resource taxes accounted for 0.64% of GDP. [145]

8.1.2 Relative Position within the EU

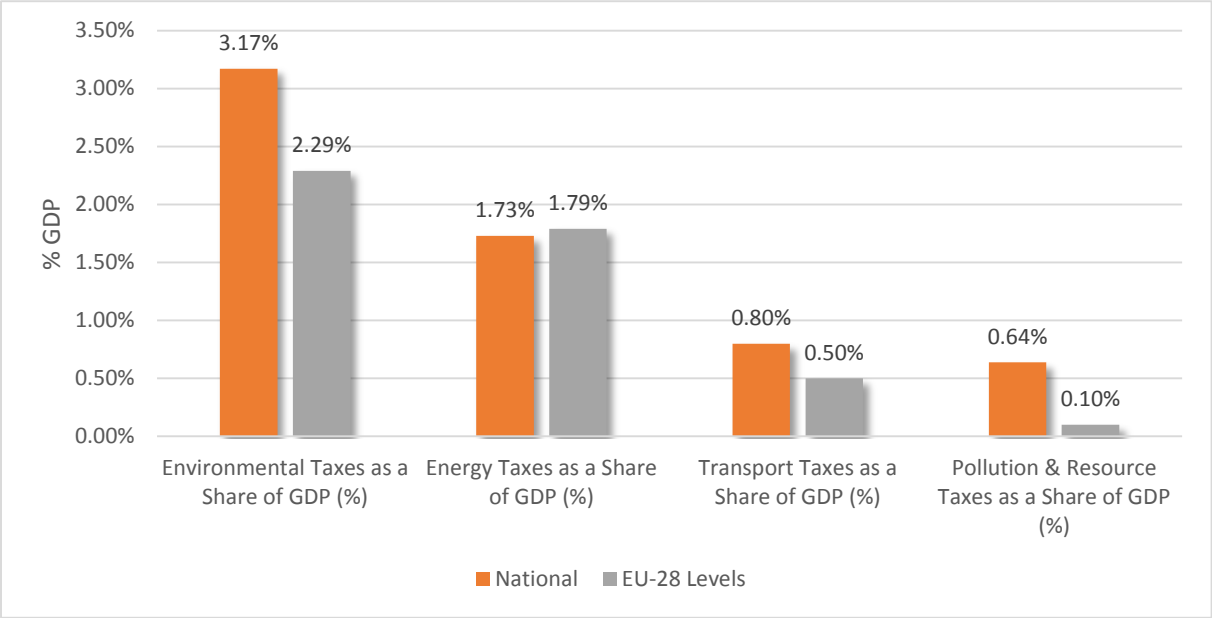
Figure 3 and Table 17 show Croatia's relative position compared to the EU-28 for a number of parameters in 2012:

- In comparison to the EU-28 level for revenues from environmental taxation as a proportion of GDP, Croatia performs well. For energy taxes, Croatia's performance is below the EU-28 level, whereas for both transport (excl. transport fuels) and pollution and resource taxes, revenues are well above the EU-28 levels, as a proportion of GDP (Figure 3).

[144] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 3 *(in press)*

[145] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Figure 3: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

- In respect of revenue from environmental taxes as a proportion of GDP, Croatia ranks 4th in the EU-28. When energy taxes are assessed by the same measure, Croatia ranks 18th, whereas it is in 6th place where transport taxes (excl. transport fuels) are concerned, and in 1st place in terms of revenues derived from pollution and resource taxes (Table 17).

Table 23: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	4
Energy Taxes as a Share of GDP (%)	18
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	6
Pollution & Resource Taxes as a Share of GDP (%)	1

Source: based on Eurostat data

8.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The details and rates for each tax, as well as full references, are given in the Appendix (this Appendix contains a detailed list of references for all of the sources of information included in this section).[146] This section summarises key aspects of the main environmental taxes, and

[146] Currency conversions from HRK to € were calculated using exchange rates for the relevant year from the following source: Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January

describes, for energy, how the rates compare with European averages, and with the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[147,148]

- **Energy:** The Croatian excise duties on fuels and electricity are shown in Table 24, alongside minimum rates in the existing ETD and the EU-28 average and median rates. Croatia's rates were updated in September 2013, following its accession to the EU on 1st July 2013.

Table 24: Standard Rates of Excise Duties on Fuels and Electricity in Croatia

Excise Duty	Unit	Rate Applied in Croatia[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol[2]	per 1,000 litres	HRK 4,100 (€541)	€421	€580	€583
Unleaded Petrol	per 1,000 litres	HRK 3,460 (€457)	€359	€536	€515
Gas Oil (Diesel)	per 1,000 litres	HRK 2,660 (€351)	€330	€425	€412
Kerosene	per 1,000 litres	HRK 2,660 (€351)	€330	€434	€410
Liquid Petroleum Gas	per 1,000 kg	HRK 100 (€13.20)	€125	€197	€176
Natural Gas	per GJ	HRK 0.00 (€0.00)	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	per 1,000 litres	HRK 2,660 (€351)	€21	€233	€242
Kerosene	per 1,000 litres	HRK 2,660 (€351)	€21	€300	€330
Liquid Petroleum Gas	per 1,000 kg	HRK 100 (€13.20)	€41	€134	€125
Natural Gas	per GJ	HRK 0.00 (€0.00)	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	per 1,000 litres	HRK 423 (€56)	€21	€178	€122
Kerosene	per 1,000 litres	HRK 1,752 (€231)	€0.00	€265	€330
Heavy Fuel Oil	per 1,000 kg	HRK 160 (€21)	€15	€71	€25

2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[147] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[148] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Croatia[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Liquid Petroleum Gas	per 1,000 kg	HRK 100 (€13.20)	€0.00	€78	€42
Natural Gas	per GJ	HRK 4.05 (€0.53)	€0.15	€1.38	€0.59
Coal and Coke	per GJ	HRK 2.30 (€0.30)	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	per 1,000 litres	HRK 423 (€56)	€21	€185	€123
Kerosene	per 1,000 litres	HRK 1,752 (€231)	€0.00	€275	€330
Heavy Fuel Oil	per 1,000 kg	HRK 160 (€21)	€15	€75	€25
Liquid Petroleum Gas	per 1,000 kg	HRK 100 (€13.20)	€0.00	€110	€43
Natural Gas[3]	per GJ	HRK 8.10 (€1.07)	€0.30	€2.11	€1.07
Coal and Coke	per GJ	HRK 2.30 (€0.30)	€0.30	€1.69	€0.32
Electricity					
Business Use	per MWh	HRK 3.75 (€0.49)	€0.50	€10.23	€1.21
Non-Business Use[3]	per MWh	HRK 7.50 (€0.99)	€1.00	€14.68	€1.91

Notes:

1. *The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013)* ECU/ECR Exchange Rates versus National Currencies, *Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12.*
2. *Leaded petrol is not sold in Croatia.*
3. *Households are exempt from paying this tax.*

Source: European Commission (2013) Taxes in Europe Database, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=2981/1380528862&taxType=Energy+products+and+electricity

- Most excise duty rates in Croatia are above the minimum levels set out in the existing ETD. Only a few rates are significantly below the minimum, and a small number fluctuate above or below the minimum, depending on currency conversion rates. At the same time as being above the minimum, almost all excise duty rates are below the EU-28 median and EU-28 averages, with the only notable exceptions to this being rates for some industrial and commercial motor fuels. As noted in the table, Croatia has also chosen to take advantage of some of the exemptions allowed for households' usage of fuels. Further details can be found in the Appendix.

- Revenue in 2012 was HRK 5.68 billion (€755 million), equivalent to 1.7% of GDP.[149]

➢ **Transport (excl. transport fuels):**

- Registration tax:
  - Croatia requires a tax to be paid to the central government at the time of registration of all motor vehicles intended for the transport of persons, including motorcycles, bicycles engines, pick-up vehicles and all-terrain vehicles. This tax is called the 'motor vehicles special tax' and was implemented following Croatia's accession to the EU on 1st July 2013. The tax rate is calculated as a percentage of sales price, with different bands depending on both the vehicle's sales price (a higher price elicits a higher percentage paid as registration tax) and either the vehicle's CO_2 emissions or environmental class, so that a more environmentally friendly vehicle pays a lower rate of tax. Electric vehicles are exempt and hybrid vehicles are taxed at a special rate.[150]
  - Prior to the new tax being introduced there was a special tax on passenger cars, other motor vehicles, vessels and aircrafts. In 2012, revenue raised by this tax was HRK 532 million (€71 million), equivalent to 0.16% of GDP.[151]
    - Revenue from 1st January 2013 to 30 June 2013 from the special tax on passenger cars, other motor vehicles, vessels and aircrafts was HRK 342 million (45 million), equivalent to 0.10% of GDP. Revenue from the special tax on motor vehicles, from 1st July 2013 to 31st December 2013 was HRK 209 million (€28 million), equivalent to 0.06% of GDP.[152]
    - In addition to the above, an environmental charge is also paid to the Croatian Environmental Protection and Energy Efficiency Fund (EPEEF) at the time of registration of all vehicles, including heavy goods vehicles.[153] The amount to be paid is calculated based on a formula which takes the engine type, volume and the age of the vehicle into account. Vehicles deemed to have a higher environmental impact are charged a higher rate.

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[149] See Table 2 in Ministry of Finance (Republic of Croatia) (2013) *Statistical Review: Ministry of Finance Monthly Statistical Review - Number 215*, August 2013, p. 4, http://www.mfin.hr/adminmax/docs/215%20AUGUST%202013.pdf.

[150] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=3222/1373445394&taxType=Other+indirect+tax

[151] See Table 2 in Ministry of Finance (Republic of Croatia) (2013) *Statistical Review: Ministry of Finance Monthly Statistical Review - Number 215*, August 2013, p. 4, http://www.mfin.hr/adminmax/docs/215%20AUGUST%202013.pdf.

[152] Personal correspondence with Ministry of Finance, Croatian Customs personal relations office, 13 January 2014.

[153] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014 *(in press)*

Revenue in 2012 was HRK 229 million (€30.4 million), equivalent to 0.07% of GDP.[154]

- Circulation tax:
  - Circulation (annual) taxes are paid for both motor vehicles (passenger cars and motorcycles) and vessels. Both of these taxes are collected by the regional authorities (county level).
    - Motor vehicle road taxes are paid on vehicles up to 10 years old and the tax rate is calculated based on the engine power and the age of the vehicle. Newer vehicles with larger engines pay a higher rate. The minimum rate for cars less than 10 years old is HRK 200 (€26) per annum.[155] Revenues in 2012 were HRK 229 million (€30 million), equivalent to 0.07% of GDP.[156]
    - The annual vessel tax rate is determined by the length expressed in meters, the age of a vessel, with or without a cabin, and the power of the engine. In 2012 the revenue was 3.1 milion HRK (€ 0.4 million)..[157]
    - There is an annual charge on the usage of public roads which generates revenue annually of more than 1 billion HRK.
    - Croatia also has a levy on insurance premiums, including third party liability for vehicles, airplanes and other methods of transport. This is described in further detail in the Appendix.

➢ **Pollution and resources:**

- A charge is levied on air pollution discharged by stationary sources, paid to the Environmental Protection and Energy Efficiency Fund. Rates are set using an equation which is based on the tonnage of emissions (charged at a set rate) multiplied by a number of coefficients related to the activity and total emissions. Air pollution charges are paid on emissions of SO_2 (base rate of HRK 310 (€41) per tonne), NO_2 (base rate of HRK 310 (€41) per tonne), and CO_2 (base rate of HRK 14 (€1.9) per tonne). Revenue in 2012 from all pollutants was HRK 71 million (€9.5 million), equivalent to 0.022% of GDP.[158]
  - In Croatia there are fees charged for the production of various environmentally harmful products and packaging materials. These charges are explained in further

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[154] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press).*

[155] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[156] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press).*

[157] Izvještaj o vlastitim prihodima i primicima državnog, županijskih i gradskih/općinskih proračuna u 2012. g

[158] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 (*in press)*

detail in the Appendix. Charges include a charge on single-use plastic bags in Croatia at €198 per tonne. An average single-use plastic carrier bag weighs 8.5g which means that there are approximately 118 bags per kg. This equates to 0.17 eurocents per bag.

- Finally, there are also a number of water-related charges, which are paid to the government agency Croatian Waters. These include a charge on the discharge of waste water, a charge on the production or import or mineral fertiliser as well as a charge on abstraction of water. These are described in further detail in the Appendix.
- It is not always completely clear whether some of the charges described should be considered as taxes or as user fees, but it is clear that the air pollution 'charges' are taxes. Also, it should be considered that the CO_2 tax might be considered as part of energy taxation.

➢ A small number of environmentally harmful subsidies have been identified from Excise Duty Tables.[159] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 8.2.2. The subsidies can be summarised as follows:

- An excise tax exemption for gas oil used in agriculture, horticulture, pisciculture and forestry.
- An excise tax exemption for the household usage of natural gas and electricity.
- Agricultural subsidies which in 2012 did not distinguish the conventional agriculture from integrated management or eco-production. Such practice discourages environmentally sound practices compared to conventional agriculture and the removal, in 2013, of a tax on agrochemicals acts similarly against positive practice.
- Another harmful subsidy is related to waste combustion which benefits from a corrective coefficient of 0.2 for emissions of fossil CO_2 from the incineration of waste.[160] Such a coefficient effectively reduces the carbon emissions to one fifth of the relevant taxable amount.

8.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Croatia. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as the basis for how the calculation of revenue generation. Outturns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

8.2.1 Current Status of EFR

In 2012, the revenues from duties on unleaded petrol fell by 5% as a result of reduced consumption, which was responding to high final sale prices. Concern over higher prices led the Croatian government to reduce the tax rate from €413.50 per 1,000 litres to €372.47 per

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[159] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1* July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[160] Croatian Regulation on unit charges, corrective coefficients and detailed criteria and benchmarks for establishing the charge for carbon dioxide emissions into the environment, (Official Gazette 73/2007).

1,000 litres on 23rd July 2012. However, upon accession to the EU, many energy excise duties were increased, including unleaded petrol. Rates were also further increased in September 2013.

The current Croatian government, elected at the end of 2011, has not demonstrated significant willingness for further environmental fiscal reform; however, a set of changes in the taxation systems were triggered by EU accession and the need to comply with EU Directives. Two of the most significant instruments which are likely to become effective in 2014 will cover waste. The proposed measures are not yet completely clear to us, but appear to relate to a levy on disposal over a specified amount, as well as an incentive fee for local government.

An important change was also noted in the charge for the discharge of waste waters (treated and untreated) to groundwater. This was aligned with EU standards and was increased from €0.12 per m^3 to €0.18 per m^3 in 2013.

8.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

<u>Adjustments to existing taxes or new taxes:</u>

- **Energy Taxes:**
  - It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO_2 price. Transport fuels are equalised using the implied tax per unit of energy on petrol (€12.5 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the rate for gas oil (€8.5 per GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate of €0.15 per GJ. Note that this implies a reduction in the existing rate for kerosene from €233 to €56 per 1,000 litres, however, for the purposes of this analysis the existing rates have been maintained.
  - Table 25 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 25: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	457	457
Light fuel oil (diesel)	€/1000 litre	494	351
LPG (propellant)	€/1000 kg	635	13

	Units	Suggested Rates	Existing Rates
Kerosene	€/1000 litre	496	351
Natural gas (prop)	€/GJ	14	0
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	351	351
Kerosene	€/1000 litre	353	351
LPG	€/1000 kg	450	13
Natural gas	€/GJ	10	0
BUSINESS HEATING			
Gas oil	€/1000 litre	57	56
Heavy fuel oil	€/1000 kg	68	21
Kerosene	€/1000 litre	231	231
LPG	€/1000 kg	65	13
Natural gas	€/GJ	1.27	0.53
Coal	€/GJ	2.04	0.30
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	57	56
Heavy fuel oil	€/1000 kg	68	21
Kerosene	€/1000 litre	231	231
LPG	€/1000 kg	65	13
Natural gas	€/GJ	1.27	1.07
Coal	€/GJ	2.04	0.30
ELECTRICITY			
Electricity - business use	€/MWh	0.99	0.49
Electricity - non-business use	€/MWh	0.99	0.99

- **Transport Taxes (excl. transport fuels):**
  - **Vehicles:** The revenues from transport taxes in Croatia are lower than the EU-28 average (0.80% of GDP compared to the EU-28 level of 0.50% GDP – see Figure

3). Scope remains for increasing vehicle taxation, as a means of raising revenue but also for differentiating between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. In line with the proposals from the Commission of 2005, we suggest that the main increase should relate to the existing circulation tax. A circulation tax differentiated by CO_2 emissions could be introduced with this in mind, and the tax might also benefit from including differentiation by emissions of particulate matter. Directive 2011/76/EU on the charging of heavy goods vehicles for the use of certain infrastructures sets common rules on distance-related tolls and time-based user charges (vignettes). There is no vignette for HGVs in Croatia. Introducing one based on axle numbers, weight and emissions would help raise revenue and incentivise reduced vehicle emissions. It is suggested that using these measures, Croatia could readily increase vehicle taxation by 0.4% of GDP. This figure is applied to future projections of real GDP in order to calculate revenue potential in future years. The increase is phased in over the period from 2015 to 2020.

- **Aviation:** Currently there is no aviation tax in Croatia. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Croatia, €25 per passenger to flights to other countries in the EU and €50 per passenger to flights to other countries outside the EU (note there was little data available on passenger flights in Croatia, so estimates were made based upon GDP). The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➢ **Pollution and Resource Taxes:**

- **Waste – landfill tax:** There is currently no landfill tax in Croatia, though some instruments regarding waste management have been proposed (though, as we understand it, not yet implemented) (see Section 8.2.1). Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Therefore, it is suggested to implement a rate of landfill tax for non-hazardous wastes starting in 2015, and gradually increasing to €50 per tonne in 2020, with the level kept constant in real terms. It is also suggested that a rate for construction and demolition wastes is implemented at €2.40 per tonne in 2015.

- **Aggregates:** There is currently no tax on aggregates in Croatia, although a fee on extraction of soil and gravel was repealed in 2008. An aggregates tax helps reduce extraction rates for aggregates, and stimulates the market for the use of

secondary materials. The instrument works well alongside taxes for landfilling of construction and demolition wastes. This approach is aligned with the Roadmap to A Resource Efficient Europe.[161] It is suggested that Croatia implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this to keep the rate constant in real terms. The types of materials that could be covered by the tax are:

- Marble
- Chalk and dolomite
- Slate
- Limestone and gypsum
- Sand and gravel

Not all of these are extracted in Croatia. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues;

- **Waste – incineration / MBT tax:** In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, of €15 per tonne in 2020. An equivalent rate is proposed for MBT facilities.
- **Packaging:** Croatia already operates a deposit refund scheme. It also has in place relatively high charges for packaging. A levy of 0.10 HRK for each unit has to be paid for each unit of packaging for food and beverages except for re-usable packaging that is included in the deposit system (beer bottles, water bottles etc.). The fee also covers oil, vinegar, detergent and other packaging that is not in the citizens' returnable fee scheme. In principle, it might be possible to apply taxes to other packaging. However, given the levy rates in Croatia, as well as the deposit refund scheme, no additional proposal is made. Packaging related charges amount to 0.14% of GDP at present, approximately double the level of revenue generated by Denmark's (recently withdrawn) packaging tax.
- **Single-use carrier bag tax**: There is currently a charge on plastic bags (whether for single or multiple use) in Croatia at €196 per tonne. An average single-use plastic carrier bag weighs 8.5g which means that there are approximately 118 bags per kg.[162] This equates to 0.17 eurocents per bag. We understand that NGOs have argued for a tax at a level of €0.66 per item, and extremely high level. Plastic bags cause many environmental problems when littered in the environment, especially when then end up in the marine environment. Taxing single-use plastic bags significantly influences consumers purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in

[161] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

the EU.[163] Therefore, it is suggested that Croatia implements a tax on single-use plastic bags at a rate of €0.07 (HRK 0.53) per bag from 2016, and following this, keeps the rate constant in real terms. Representatives from Croatia indicate that current levels of charge are of the order €0.026 per bag and upwards.

- **Air pollution:** Croatia has a system of air pollution charges in place. There have been notable improvements in air quality, but the effectiveness of these charges in reducing air pollution has been questioned due to the fact that rates have not been increased since 2008 and that rates have been eroded by inflation.[164,165] The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). It is suggested the rates for SOx and NOx could be increased and a new rate added for particulates, at the following levels, to generate additional improvements in air quality:
    - SOx €1,000 per tonne
    - NOx €1,000 per tonne
    - PM_{10} €2,000 per tonne

  Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates are then held constant in real terms.

- **Water abstraction:** A central tenet of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs".* Croatia already has a water abstraction fee in place, but the extent to which it covers all relevant costs is unclear. The suggested fee for abstraction for public supply (€90 per 1,000m^3) is lower than the existing fee for high quality water (€180 per 1,000m^3), but higher than for other water qualities. It is suggested that all rates be increased to at least €125 per 1,000m^3 for the public water supply, €55 per 1,000m^3 for manufacturing purposes and €7 per 1,000m^3 for agriculture. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates are then held constant in real terms. The revenue from the existing charges currently accrues to Croatian Waters. Some consideration might be given to the appropriate use, and destiny of, additional revenues, with the intention to distinguish between levels of fee required to cover

[164] See Annex III in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, pp. 191 – 192. *(in press)*

[165] Ibid., p. 81.

the financial costs of maintaining the water resources, and those which have a more specifically environmental rationale.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[166] Croatia has a water discharge fee set at €180 per 1,000m^3 and modified by three coefficients that are dependent on the composition of waste water, the type or amount of treatment it has received as well as excess water discharging . It has not been possible to correlate the existing structure to BOD, but to improve prevention of water pollution it is suggested to adjust existing charge rates in-line with 'good practice'. With relative price levels in Croatia this would imply a rate of €1.47 (HRK 11) per kg BOD. For fresh-water discharges also phosphorus should be charged, while for coastal discharges a charge on nitrogen could be relevant. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. It is suggested that rates should be held constant in real terms once they reach the 2020 levels. As with revenue from the existing abstraction charges, revenue currently accrues to Croatian Waters. As with the increased revenue from abstraction, consideration might be given to the appropriate use, and destiny of, these additional revenues. Part of the revenues could accrue to national budget.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  "…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".

  Croatia published its National Action Plan in June 2013. Although the Plan does not set objective reduction targets, it states that it is intended to establish the:

  "… quantitative assumptions, objectives, measures and timetables to reduce the risks and impacts of pesticides on human health and the environment, and stimulates the development and implementation of integrated pest management, and of alternative approaches or techniques in order to reduce dependency on the use of pesticides".[167]

  According to the Plan pesticide use increased between 2004 and 2007.[168] However, despite the clear objectives set out in the Plan – that is, reducing the

[166] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

[167] Croatian Ministry of Agriculture (2013) *National Action Plan to Achieve Sustainable Use of Pesticides for the Period 2013 – 2023*, June 2013, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_croatia_en.pdf, p.3

[168] Ibid. Table 1 on p. 5

dependency on pesticides – a small tax on pesticides in Croatia linked to water quality was abolished in 2013 (the tax was set at HRK 0.20 (€0.0077) per kilogram active ingredient). The tax was reportedly cut as it was feared that it compromised the competitiveness of Croatia's agricultural sector on the EU market.[169] Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Croatia. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 (HRK 76) per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan. It should be noted that exporters of pesticides would typically be exempt from the tax.

- **Fertilisers**: A tax on mineral fertilisers is already in place and was increased in 2013 to HRK 3.7 (€0.49) per tonne of nitrogen. It is suggested that this is further increased to €200 (HRK 1,530) per tonne of nitrogen from 2016 to 2018 as a means of driving efficiencies in the application of fertilisers to land.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study are listed in Table 26. Further details of our calculation methodology are available in Appendix A.7.4.

A further example of an environmentally harmful subsidy is the circulation tax for motor vehicles. This tax is only levied on vehicles up to 10 years old, and could therefore encourage owners to retain older, more polluting vehicles.[170]

[169] Government of Croatia (2013) *Prijedlog Zakona o Izmjenama i Dopunama Zakona o Financiranju Vodnoga Gospodarstva, s Konačnim Prijedlogom Zakona*, www.vlada.hr/hr/content/download/254139/3742058/file/85.-2.b.pdf

[170] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 26: Environmentally Harmful Subsidies – Calculated Revenues Forgone

Subsidy	Calculated Revenue Forgone in real 2013 terms (HRK million)
ENERGY	
Excise tax exemption for gas oil used in agriculture, horticulture, pisciculture and forestry	468.7[1]
Excise tax exemption for household usage of natural gas	201.5[1]
Excise tax exemption for household usage of electricity	48.0[1]
Total	718.3

Notes:

1) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

8.2.3 Summary of Revenue Outcomes

Table 27 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 27: Potential Additional Revenue from Environmental Fiscal Reform in Croatia, million HRK (real 2013 terms)[171]

Type	2016	2020	2025
Energy			
Transport fuels	159	774	1,219
C&I / Heating	89	260	260
Electricity	26	26	26
Sub-total Energy, million HRK	273	1,059	1,504
Sub-total Energy, % GDP	0.08%	0.29%	0.39%

[171] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Transport (excl. transport fuels)			
Vehicle Taxes	258	1,331	1,413
Passenger Aviation Tax	455	914	949
Freight Aviation Tax	0.24	0.47	0.49
Sub-total Transport, million HRK	714	2,245	2,362
Sub-total Transport, % GDP	0.21%	0.62%	0.61%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	181	388	416
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	8	20	23
Air Pollution Tax	230	464	454
Water Abstraction Tax	4	9	8
Waste Water Tax	251	351	351
Pesticides Tax	30	51	45
Aggregates Tax	95	57	57
Packaging Tax	0	0	0
Single Use Bag Tax	274	53	59
Fertiliser Tax	0.027	0.049	0.047
Sub-total Pollution & Resource, million HRK	1,073	1,394	1,413
Sub-total Pollution & Resources, % GDP	0.31%	0.38%	0.37%
Total Environmental Taxes			
Total, million HRK	2,061	4,698	5,279
Total Increase, % GDP	0.60%	1.29%	1.37%
Total Environmental Harmful Subsidies			
Total, million HRK	718	718	718
Total Increase, % GDP	0.21%	0.21%	0.21%

Type	2016	2020	2025
Total Potential for Environmental Fiscal Reform			
Total, million HRK	**2,779**	**5,416**	**5,997**
Total Increase, % GDP	**0.81%**	**1.50%**	**1.58%**

8.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, HRK 1.2 billion of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in SOx, NOx and PM10 emissions, reduced diesel and coal consumption and reduced reliance on landfills.

Table 28: Monetised Environmental Benefits from Implementation of Taxes, million HRK (real 2013 terms)

Tax Type	2016	2020	2025
Energy	22	72	88
Transport	26	73	74
Pollution & Resources	223	1,031	1,006
Total, million HRK	272	1,176	1,167
Total, % GDP	0.08%	0.33%	0.32%

8.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Croatia:[172]

- In 2012 environmental taxes generated revenue equivalent to 3.17% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **HRK 2.1 billion (€0.27 billion)** in 2016, rising to **HRK 5.3 billion (€0.7 billion)** in 2025 (both in real 2013 terms). This is equivalent to **0.6%** and **1.37%** of GDP in 2016 and 2025 respectively. Further

[172] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

revenue could be generated by removing environmentally harmful subsides which are estimated to be **HRK 0.7 billion (€0.09 billion)** in 2016 (real 2013 terms), equivalent to **0.21%** of GDP.

- The largest single contribution comes from the suggested changes to vehicle taxation. This accounts for **HRK 1.4 billion (€0.19 billion)** by 2025 (real 2013 terms), equivalent to **0.29%** of GDP. It was suggested that the main changes could be in the circulation taxes, with these being differentiated according to the environmental performance of the vehicles.
- It was suggested that taxes on transport fuels be equalised using the energy content on petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **HRK 1.2 billion (€0.16 billion)** of additional revenue in 2025 (real 2013 terms), equivalent to **0.25%** of GDP.
- The suggested introduction of a tax on passenger flights could yield **HRK 0.9 billion (€0.12 billion)** by 2025 (real 2013 terms), equivalent to **0.2%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- It has been estimated that the suggested increase in the air pollution charges could result in an additional **HRK 0.5 billion (€0.06 billion)** of revenue in 2025 (real 2013 terms), equivalent to **0.09%** of GDP.
- A landfill tax could result in an additional **HRK 0.4 billion (€0.05 billion)** of revenue in 2025 (real 2013 terms), equivalent to **0.09%** of GDP.
- In addition, minor taxes on, *inter alia*, the landfilling of waste, water abstraction, single use plastic bags, and aggregates, could generate revenue of **HRK 0.8 billion (€0.11 billion)** by 2025 (real 2013 terms), equivalent to **0.17%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **HRK 1.2 billion (€0.15 billion)** in 2025 (real 2013 terms), or **0.32%** of GDP.
- The 2013 Annual Growth Survey (AGS) identified one key priority, that:
    - *"Tax should be designed to be more growth-friendly, for instance by shifting the tax burden away from labour on to tax bases linked to consumption, property, and combatting pollution".*[173]

The above package, or elements thereof, would clearly help to meet the objective in respect of shifting the tax burden away from labour to be more growth friendly.

[173][173] European Commission (2013) *Annual Growth Survey 2014*, COM(2013) 800 Final, http://ec.europa.eu/europe2020/making-it-happen/annual-growth-surveys/index_en.htm, p. 7

9.0 Czech Republic

9.1 Country Overview

9.1.1 Key Facts about the Economy and Tax System

- The Czech Republic experienced significant economic growth during the period 2004 to 2008, with GDP increasing at an average rate of 5.5% per annum in real terms. The recession had a noticeable impact, leading to a drop of 4.5% in GDP in real terms from 2008 to 2009. Economic growth resumed in 2010, but at a much slower rate compared to pre-recession levels. The country's GDP fell in 2012 by 1% in real terms.[174]
- The Czech Republic's overall tax revenue (including social contributions) amounted to 35% of GDP in 2012, having risen from a low of 33% in 2009.[175]
- In 2012, the largest proportion of the Czech Republic's tax revenue came from social security contributions (45% of total tax revenue). Indirect taxes also form a significant proportion of total taxation (34%). The share of direct taxes (21%) has fallen by around five percentage points from 2003 levels.
- In 2012 (the latest year for which Eurostat data is available), revenues from environmental taxes were 2.35% of GDP (6.72% of total tax revenues). Between 2001 and 2012, no clear trends are present for this ratio, with environmental tax revenues fluctuating between 2.35% and 2.58% of GDP (6.7% and 7.3% of total tax revenues).[176]
- The largest proportion of environmentally-related taxation in 2012 was derived from energy taxes, which accounted for 2.19% of GDP. Taxes on transport (excl. transport fuels) accounted for 0.14% of GDP whilst taxes on pollution and resources accounted for 0.02% of GDP.[177]
- The proportion of total environmental tax revenue realised from energy taxes has steadily increased over time, from 89% of total environmental tax revenues in 2001 to 93% in 2012.[178]

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[174] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[175] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[176] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

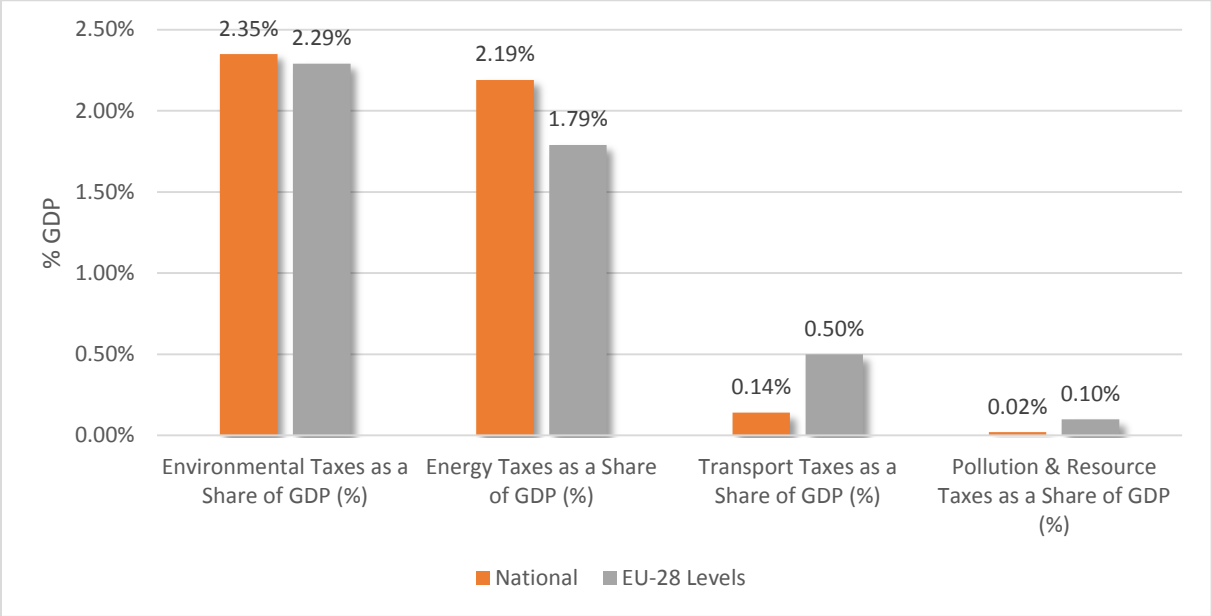
[177] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[178] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

9.1.2 Relative Position within the EU

- In 2012, revenue from environmental taxes – as a proportion of GDP – was slightly higher than the EU-28 level of 2.29%. Revenue from energy taxation was substantially higher than the EU-28 level of 1.79% of GDP, whilst revenues from transport taxes (excl. transport fuels), at 0.14% GDP, were substantially lower than the EU-28 level of 0.50% GDP. Taxes on pollution and resources in the Czech Republic also yielded below average revenues relative to the EU-28 as a whole (0.02% GDP) (see Figure 4).[179]

Figure 4: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

- As a proportion of GDP, revenues from environmental taxation in the Czech Republic ranked 20th in the EU-28 in 2011. By the same measure, revenues from energy taxation ranked 7th in the EU-28 in the same year. Taxes on transport (excl. transport fuels) ranked 25th, whilst taxes on pollution and resources ranked 23rd (see Table 29).[180]

[179] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[180] Ibid.

Table 29: Ranking of Country Position in EU-28, 2011

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	20
Energy Taxes as a Share of GDP (%)	7
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	25
Pollution & Resource Taxes as a Share of GDP (%)	23

Source: based on Eurostat data

9.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax are given in the Appendix (this Appendix also includes a detailed list of references for all of the information cited in this section). This section summarises key aspects of the main environmental taxes, and describes, for energy, how the rates compare with European average levels, and the minimum rates set out in the existing Energy Tax Directive (2003/96/EC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[181,182]

- **Energy:** The Czech excise duties on fuels and electricity are shown in Table 30, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

Table 30: Standard Rates of Excise Duties on Fuels and Electricity in the Czech Republic

Excise Duty	Unit	Rate Applied in Czech Republic[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	per 1,000 litres	CZK 13,710.00 (€527.71)	€421	€580	€583
Unleaded Petrol	per 1,000 litres	CZK 12,840.00 (€494.22)	€359	€536	€515
Gas Oil (Diesel)	per 1,000 litres	CZK 10,950.00 (€421.48)[2]	€330	€425	€412

[181] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[182] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Czech Republic[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	per 1,000 litres	CZK 10,950.00 (€421.48)	€330	€434	€410
Liquid Petroleum Gas	per 1,000 kg	CZK 3,933.00 (€151.39)	€125	€197	€176
Natural Gas	per GJ	CZK 9.50 (€0.37)	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	per 1,000 litres	CZK 10,950.00 (€421.48)	€21	€233	€242
Kerosene	per 1,000 litres	CZK 10,950.00 (€421.48)	€21	€300	€330
Liquid Petroleum Gas	per 1,000 kg	CZK 1,290.00 (€49.66)	€41	€134	€125
Natural Gas	per GJ	CZK 8.50 (€0.33)	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	per 1,000 litres	CZK 10,950.00 (€421.48)[3]	€21	€178	€122
Kerosene	per 1,000 litres	CZK 10,950.00 (€421.48)	€0.00	€265	€330
Heavy Fuel Oil	per 1,000 kg	CZK 472.00 (€18.17)	€15	€71	€25
Liquid Petroleum Gas	per 1,000 kg	CZK 0.00 (€0.00)	€0.00	€78	€42
Natural Gas	per GJ	CZK 8.50 (€0.33)	€0.15	€1.38	€0.59
Coal and Coke	per GJ	CZK 8.50 (€0.33)	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	per 1,000 litres	CZK 10,950.00 (€421.48)	€21	€185	€123
Kerosene	per 1,000 litres	CZK 10,950.00 (€421.48)	€0.00	€275	€330
Heavy Fuel Oil	per 1,000 kg	CZK 472.00 (€18.17)	€15	€75	€25
Liquid Petroleum Gas	per 1,000 kg	CZK 0.00 (€0.00)	€0.00	€110	€43
Natural Gas	per GJ	CZK 8.50 (€0.33)	€0.30	€2.11	€1.07

Excise Duty	Unit	Rate Applied in Czech Republic[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Coal and Coke	per GJ	CZK 8.50 (€0.33)	€0.30	€1.69	€0.32
Electricity					
Business Use	per MWh	CZK 28.30 (€1.09)	€0.50	€10.23	€1.21
Non-Business Use	per MWh	CZK 28.30 (€1.09)	€1.00	€14.68	€1.91

Notes:

1. The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013) ECU/ECR Exchange Rates versus National Currencies, *Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12.*

2. For diesel blends comprising of not less than 30% of rapeseed oil methyl ester of volume, a reduced rate of 7,665.00 CZK (€298.09) applies until 30 June 2015.

3. There is a reimbursement of excise duty of 10,290 CZK per 1,000 litres when it has been duly proved that the gas oil has been used for heating purposes

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- In the Czech Republic, for a given fuel, such as diesel or kerosene, there are equal rates across different uses. As a result, because of the way the minimum rates in the existing ETD are set, then for some uses of some fuels, the rates are well above the minimum rates in the existing (and proposed) ETD.
- The majority of the rates, however, are below EU-28 average and median figures. The main exceptions to this are the tax rates for gas oil (diesel) and kerosene, which are substantially higher than the EU-28 average and median figures for all uses other than propellant use.
- Revenues in 2012 from fuel excise duties were:
  - Mineral oil duties: CZK 78,832 million (€3,143 million), equivalent to 0.84% of GDP.
  - Natural gas duties: CZK 1,258 million (€50 million), equivalent to 0.013% of GDP.
  - Coal and coke duties: CZK 454 million (€18 million), equivalent to 0.0048% of GDP.
  - Electricity duties: CZK 1,347 million (€54 million), equivalent to 0.014% of GDP.
- A levy on electricity from solar radiation has been in place in the Czech Republic since 2011. As of 1st January 2014 these rates were reduced significantly to further encourage the uptake of power generation from solar energy. Tax

revenues in 2012 totalled CZK 6,403 million (€255 million), equivalent to 0.068% of GDP.[183]

- **Transport (excl. transport fuels):**
  - In the Czech Republic, there is both a vehicle registration fee and an annual circulation tax.
  - In addition to a basic one-off car registration fee, an 'environmental' car registration fee was introduced in 2009 for all passenger cars. This fee is paid for the first registration of imported used vehicles in the Czech Republic and for the first re-registrations of vehicles already registered in the Czech Republic. In 2012, CZK 334 million (€13.3 million, equivalent to 0.009% of GDP) was raised from the registration fee and used to support the recovery of car wrecks.[184]
  - The vehicle circulation tax applies to all vehicles used for business activities within the Czech Republic. Tax rates are differentiated according to vehicle age and emissions performance. In 2012 the Government derived a total of CZK 5,206 million (€212 million) from this tax (equivalent to 0.14% of GDP).[185]
  - The Czech Republic also has a highway usage fee in place for all vehicles whose maximum weight does not exceed 3.5 tonnes and which make use of motorways, high-speed roads and selected class I roads. The highway fee is currently set at a flat rate of CZK 1,500 (€58) per year for vehicles weighing up to 3.5 tonnes. Revenues from this fee were reported to be CZK 3,872 million (€154 million) in 2012.[186]
  - For vehicles whose maximum weight exceeds 3.5 tonnes a system of road tolls apply on motorways, high-speed roads and selected class I roads. The rates differ by vehicle category (buses x the rest), used road (motorways and high-speed roads x selected I. class roads), time of day (Friday 3-9 p.m. x the rest time of week), emission limit (0-II x III-IV x V and more) and number of axles (2 x 3 x 4 and more).. The toll rate varies between a minimum rate of CZK 0.79 (€0.03) per km and a maximum rate of CZK 11.76 (€0.46) per km. In 2012, revenues from these road tolls amounted to CZK 8,665 million (€345 million) equivalent to 0.23% of GDP.[187]
  - Motor vehicle entry fees are levied on the entrance to selected places in the Czech Republic. The tax rate is set by local government and can be up to a

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[183] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[184] www.sfzp.cz

[185] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[186] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[187] Taken from www.sfdi.cz (Annual report 2012).

maximum of CZK 20 (€0.78) per day. In 2012 revenues from these fees totalled CZK 23 million (€915 thousand), equivalent to 0.001% of GDP.[188]

- **Pollution and resources:**
  - The Czech Republic's landfill tax has two components:
    1. A basic charge with a tax rate of CZK 500 (€20) per tonne for municipal and other wastes, and CZK 1,700 (€68) per tonne for hazardous waste; and
    2. A 'risk charge' of CZK 4,500 (€179), which is paid only on hazardous waste.

    The basic rate of tax is paid directly to municipalities, whilst the risk charge is paid to the State Environmental Fund. At present, there are no firm plans to increase the landfill tax rates in the Czech Republic. In 2011, revenues from both the basic and risk charges were CZK 1,817 million (€74 million), equivalent to 0.048% of GDP.
  - The Czech Republic has an air pollution tax with rates charged per tonne of pollutant emitted into the atmosphere. Taxes are applied to four common pollutants: nitrogen oxides (NOx), particulate matter (PM), sulphur dioxide (SO_2), and volatile organic compounds (VOCs). The rates are due to increase in the coming years. By way of example, the rate for SO_2 will rise from its current rate of CZK 1,350 (€49) per tonne to CZK 4,900 (€178) per tonne after 2020. The increased tax rates are intended to help the country meet its air quality targets. In 2011, revenue from this tax amounted to CZK 440 million (€18 million), equivalent to 0.0048% of GDP.
  - A water extraction fee is applied in the Czech Republic for any withdrawal of groundwater with a total volume of more than 6,000m^3 annually (there are a number of permitted exemptions). This fee is set at CZK 2,000 (€80 per) per m^3 if the water is to be used for drinking water supply or CZK 3,000 (€120) per m^3 if the water is extracted for other uses. In 2011, revenues from the extraction of groundwater amounted to CZK 716 million (€29 million), equivalent to 0.019% of GDP.
  - The discharge of waste water into surface water is also governed by a charging system. The 'fee for the discharge of waste water into surface water' is proportionate to the amount of waste water discharged and is set at CZK 0.10 (€0.0040) per m^3, with an additional charge levied depending on the chemical composition of the water. Tax revenues in 2012 totalled CZK 212 million (€9 million), equivalent to 0.0024% of GDP.[189]
  - There are a number of other minor environmental taxes or fees in the Czech Republic which relate to ozone depleting chemicals, underground water

[188] www.mfcr.cz – database UFIS.

[189] www.sfzp.cz – Annual Report 2012

discharge, mineral extraction, and the withdrawal of land from agriculture or forestry (see the Appendix for more details).

- A number of environmentally harmful subsidies have been identified from work undertaken by IEEP and OECD, and from Excise Duty Tables.[190,191,192] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 9.2.2 (all subsidies are detailed in Appendix A.8.4). The main subsidies can be summarised as follows:
  - Subsidies on company cars provided by employers are strongly encouraged by the current tax system. Employers consider company cars as cheap, non-wage compensation.[193]
  - Energy tax exemptions for certain uses of solid fuels.

9.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in the Czech Republic. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes. Outturns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

9.2.1 Current Status of EFR

Environmental taxes in the Czech Republic are not as significant in terms of overall tax revenues as, for example, in Nordic countries. It is, however, evident that their role is increasing, not least as the country seeks to implement new policies to grapple with the worsening environmental situation within the country.

A steadily increasing focus on the implementation of environmental taxes is evident in the Czech Republic. Such measures are the subject of ongoing discussions, conducted with the aim of establishing the best methods to discourage environmentally harmful behaviour, and increase the effective utilization of natural resources. Despite these developments, the environmental taxes and charges currently in place are still not driving significant changes in behaviour.

The system of environmental taxes and charges in the Czech Republic was introduced in the beginning of the 1990s. The system implemented at this time was rather complex and is still evolving as a result. At this time, environmental taxes, in the narrow sense of the term – that is, compulsory, *unrequited* payments to general government levied on tax-bases deemed to be of particular environmental relevance – included mainly energy and transport taxes. Taxes on pollution, resources and products were introduced as charges or fees, with revenues earmarked for the State Environmental Fund, as well as for regional government. Examples of these

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[190] See Table 4 in IEEP (2013) *Steps to Greening Country Report: Czech Republic*, Report for the European Commission, pp.13-14

[191] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 127-136, dx.doi.org/10.1787/9789264187610-en

[192] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1* July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[193] IEEP (2012) *Study supporting the phasing out of EHS*, October 2012, http://ec.europa.eu/environment/enveco/taxation/pdf/report_phasing_out_env_harmful_subsidies.pdf

charges include air pollution charges, charges on the disposal of wastes, and fees for the discharge of waste water into underground sources.

The system of environmental taxes and charges remains complex and the administrative cost of managing and collecting the revenue can be rather high, in some instances, much higher than the revenue raised from the environmental taxes themselves. For example, 0.97% of the revenue derived from excise duties is spent on administration. The administrative cost of air pollution charges from large sources of pollution were 3.0% of total revenues, whilst the administrative cost of charges on air pollution from medium-sized sources were 137% of the total revenues.[194,195,196]

Further motivations for the introduction of environmental taxes, charges and fees were as follows:

- To discourage environmentally harmful behavior and increase the effective utilization of natural resources; and
- To collect earmarked revenues for non-budgetary funds and use them for environmental purposes.

In the last 20 years, the environmental situation in the Czech Republic has improved significantly. However, the fiscal motivation of environmental charges and fees remains, partly because these revenues are not distributed through the state budget on the basis of parliament debate, but rather, directly by those responsible for management of specific funds, or by regional governments. As such, there is clear interest in maintaining revenue flows, but not necessarily increasing them with a view to driving change in behavior.

In 2007 the Czech government produced a document entitled *Principles and Schedule of Environmental Tax Reform.* Initially, the environmental tax reform was planned to take place in three stages from 2008 to 2017, with the intention that all changes should be revenue neutral.

The first stage began in 2008, when a number of new taxes were introduced. The introduction of these taxes was also motivated by the requirements set out in the 2003 Energy Taxation Directive (2003/96/EC).[197] In association with these changes to indirect energy taxes, a single personal income tax rate was introduced, replacing the prior system of progressive taxation. At the same time, corporate income tax rates were decreased from 24% in 2007 to 19% in 2010 (the rate was 21% in 2008 and 20% in 2009).

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[194] Vítek, Leoš, Pavel, Jan, Jílková, Jiřina (2007*) Comparison of the Administrative Costs of the Environmental Charges on Air Pollution for Large and Extra-Large Sources of Air Pollution*, Banská Bystrica 4th December 2007, In: ORVISKÁ, Marta, PISÁR, Peter (ed.). Európske Financie – Teória, Politika a Prax [CD-ROM]. Banská Bystrica : Ekonomická fakulta Univerzity Mateja Bela, 2007, s. 15. ISBN 978-80-969535-8-5

[195] Pavel, Jan, Slavíková, Lenka, Jílková, Jiřina (2009) *Ekonomické Nástroje v Politice Životního Prostředí: Drahé Daně a Nízká Účinnost*, Ekonomický časopis, roč. 57, č. 2, s. 132–144. ISSN 0013-3035.

[196] Jílková, Jiřina, Pavel, Jan, Vítek, Leoš, Slavík, Jan. (2006) *Poplatky k Ochraně Životního Prostředí a Jejich Efektivnost. 1. vyd*. Praha,Eurolex Bohemia. 136 s. ISBN 80-7379-002-5

[197] As with several other Member States, the Czech Republic was allowed to defer some changes required by the existing ETD.

The aim of the second phase of environmental tax reform in the Czech Republic was to reduce harmful air emissions. The Ministry of the Environment considered a number of economic instruments to achieve their desired goals. These included changes to air pollution charges, as well as the introduction of carbon taxation. This occurred during the period when the European Commission started work on amendments to Directive 2003/96/EC, leading to the submission of an updated version proposing the introduction of a carbon tax component into the energy taxes covered by the ETD.

The position of the Czech government on carbon taxation has generally been favorable until quite recently. The Ministry of Finance worked to introduce carbon taxation into the Czech tax system from 2011 onwards. The introduction of carbon taxation (€15 per tonne CO_2) was primarily a fiscal policy (i.e., undertaken for reasons of budgetary consolidation), although the environmentally beneficial nature of the tax was also discussed during its implementation. Carbon taxation continued until March 2013, at which point the Czech government made the decision to revoke the tax, with the stated aim of relieving the additional burden imposed on Czech industry and the business sector as a whole.

In association with the consolidation of the public budget in 2011, the Czech government significantly reduced the refund of excise tax on gas oil for agricultural purposes in 2013. From 2014 onwards, our understanding at the time of writing is that it is intended that this tax allowance will be abolished completely.

Because of ongoing negotiations around amendments to the Directive 2003/96/EC in the Council, the Ministry of Environment maintained air pollution charges for the second phase of environmental tax reform and increased their rates for subsequent years. It also substantially changed the system, which can be seen as the second phase of environmental tax reform. The form of the third phase of the environmental tax reform depends on the result of these negotiations.

In 2013, in the context of the European Semester, a country specific recommendation was made to Czech Republic as follows:

> **Recommendation 2:** *Reduce the high level of taxation on labour by shifting taxation to areas less detrimental to growth, such as recurrent taxes on housing and vehicle circulation taxes. Further reduce discrepancies in the tax treatment of employees and the self-employed. Improve tax compliance and reduce compliance costs by establishing the Single Collection Point and harmonising the tax bases for personal income tax and social and health contributions.*

In the last two years, the issue of environmental tax reform has not been the subject of political discussion. The Czech Republic has recently adopted an interim government, which was chosen by the president after the resignation of the prime minister in 2013. Recent discussions suggest that the government will not increase taxes in 2014. A special tax branch is under discussion (covering the energy, telecommunications, and financial sectors). The tax refund for agricultural purposes is likely to be introduced again from 2015. The topic of carbon taxation is yet to resurface.

The State Environmental Fund is currently implementing a project focused on the reform of the Fund. The discussion covers not only the management of the Fund, but also the rationale for management of charge revenues.

9.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

Adjustments to existing taxes or new taxes:

- **Energy Taxes:**
  - It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO_2 price. Transport fuels are equalised using the energy content on petrol (€13.7 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€10.5 per GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the rate of €0.15 per GJ. In principle, and to respect the form of the equation which the proposed ETD suggests should be applied, this would imply a need to reduce the existing rate for kerosene and gas oil from €421 to €56 per 1,000 litres. However, for the purposes of this analysis the existing rates have been maintained on the assumption that the partial exemption for heating use of such fuels would be maintained.[198]
  - Table 31 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.

Table 31: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Proposed Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	494	494
Light fuel oil (diesel)	€/1000 litre	534	421
LPG (propellant)	€/1000 kg	688	151
Kerosene	€/1000 litre	537	421
Natural gas (prop)	€/GJ	15	0
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	421	421
Kerosene	€/1000 litre	424	421

[198] Taken together, these measures are a mechanism to avoid the use of energy carriers sold as heating fuels in applications other than heating. This does, however, have implications for the administration of the system of duties.

	Units	Proposed Rates	Existing Rates
LPG	€/1000 kg	542	50
Natural gas	€/GJ	12	0
BUSINESS HEATING			
Gas oil	€/1000 litre	421	421
Heavy fuel oil	€/1000 kg	68	18
Kerosene	€/1000 litre	421	421
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.33
Coal	€/GJ	2.04	0.33
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	421	421
Heavy fuel oil	€/1000 kg	68	18
Kerosene	€/1000 litre	421	421
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.33
Coal	€/GJ	2.04	0.33
ELECTRICITY			
Electricity - business use	€/MWh	1.09	1.09
Electricity - non-business use	€/MWh	1.09	1.09

- **Transport Taxes (excl. transport fuels):**
  - **Vehicles – general taxes:** The taxes on transport in the Czech Republic are among the lowest in the EU (0.14% of GDP compared to the EU-28 level of 0.50% GDP). However, due to relatively high taxes on transport fuels (around the EU-28 average) and an increase in revenue from diesel (though the rate increasing from €421 to €553 /1,000 litre), taxes on transport (excluding transport fuel) and on transport fuels would, in combination, be at reasonable levels relative to the EU-28. However, given the low share of taxes on transport (excluding fuel) in the country, there is still considerable scope for generating additional revenue. In line with the country specific recommendation in last year's European Semester process, an increase in the existing circulation tax is suggested, with the tax base potentially including particulate matter (as well as CO_2 emissions) to help foster

improvements in air quality (see below). If Czech Republic applied a circulation tax at the level, per vehicle, equivalent to the highest levels, adjusted for PPP, an additional 1.1% GDP could be generated. Here, we have suggested a more modest increase of 0.28% of GDP. The increase is phased in over the period from 2015 to 2020.

- **Vehicles – motor vehicle entry fee.** Municipalities in the Czech Republic have rarely instituted the motor vehicle entry fee.[199] Increased implementation of this fee to control access to urban areas could serve to increase public transport usage in urban areas and help to address the Czech Republic's significant urban air pollution issues.
- **Aviation:** Currently there is no aviation tax in the Czech Republic. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within the Czech Republic, €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➢ **Pollution and Resource Taxes:**

- **Waste – landfill tax:** The level of landfill tax applied to non-hazardous waste in the Czech Republic was set at CZK 500 (€19.91) per tonne (in nominal terms) in 2011.[200] The rate has not changed since this time and there are currently no firm plans to increase the tax rate.[201] Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Increases in the tax would help drive the change in the waste management sector needed to meet EU targets in 2020 and give support to the application of the waste hierarchy. Therefore, it is suggested to increase the rate of landfill tax for non-hazardous

[199] OECD (2005) Environmental Performance Reviews: Czech Republic 2005, October 2005, p.113

[200] ETC/SCP (2013) Overview of the use of Landfill Taxes in Europe, April 2012, p.25, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1

[201] Personal communication with Professor Jirina Jilkova, Prague University of Economics, 25th January 2014

wastes to €50 per tonne in 2018 and index rates thereafter so that the tax remains constant in real terms.

- **Aggregates:** There is a mineral extraction fee in place in the Czech Republic, levied per unit of area extracted, which can be up to 10% of the market price of the mineral. Insufficient data were available on rates or revenues to allow an exact estimation of the implied rate, expressed per tonne of material extracted. The existing tax base is not 'environmental' per se. It offers limited incentive for environmental improvement (rather, it suggests that extraction per unit of area would be maximised). Taxes on mineral aggregates help reduce extraction rates for aggregates, thereby contributing to reduction in associated environmental problems, and they stimulate the market for the use of materials derived from secondary sources.[202] The instrument works well alongside taxes for landfilling of construction and demolition wastes. This approach is aligned with the Roadmap to A Resource Efficient Europe.[203] It is suggested that the Czech Republic replaces the existing mineral extraction fee with a tax set at €2.40 per tonne from 2016, and following this keeps the rate constant in real terms. The types of materials that could be covered by the tax are:
    - Marble
    - Chalk and dolomite
    - Slate
    - Limestone and gypsum
    - Sand and gravel

  Not all of these are extracted in Czech Republic. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste – incineration / MBT tax:** There are currently three incinerators operating in the Czech Republic, and more capacity is planned to be built in coming years. In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, of €15 per tonne in 2018. An equivalent rate is proposed for MBT facilities which are already operating in the Czech Republic. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.[204]

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention

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[202] European Environment Agency (2008) *Effectiveness of Environmental Taxes and Charges for Managing Sand, Gravel and Rock Extraction in Selected EU Countries*, June 2008, www.eea.europa.eu/publications/eea_report_2008_2

[203] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[204] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

initiatives in the packaging industry, and reduce the demand for raw materials. Currently, businesses are only required to register with PRO schemes for the recovery of waste packaging.[205] It is suggested that the following rates could be applied to all packaging placed on the market in Czech Republic:

- Aluminium €197 per tonne
- Plastic €64 per tonne
- Steel €54 per tonne
- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax**: There is currently no tax on single-use plastic bags in the Czech Republic. Plastic bags cause many environmental problems when littered in the environment, both in the terrestrial context, and especially when they are transported to, or littered in, the marine environment. A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[206] Therefore, it is suggested that the Czech Republic implements a tax on single-use plastic bags at a rate of €0.07 per bag from 2016, and following this to keep the rate constant in real terms.
- **Air pollution:** The Czech Republic has a system of air pollution taxes in place, and rates are set to increase between now and 2015. There have been notable improvements in air quality, but some issues remain in urban areas.[207] The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to Airbase (EEA) 89% of the urban population in the Czech Republic were exposed to PM_{10} concentrations exceeding the daily limit value (50

[205] EKO-KOM (2013) *System Comprehensive Fulfilment Obligations of Take-Back and Recovery of Packaging Waste*, http://www.ekokom.cz/uploads/attachments/English/The_Guide_3.2-13.pdf

[206] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[207] IEEP (2013) Steps to Greening Country Report: Czech Republic, Report for the European Commission, pp.28-35

μg/m^3) for over 35 days in 2011 (the year for which the most recent data is available).[208] It is suggested that the planned rates could be increased further to generate additional incentives for abatement, and hence, improvements in air quality. The suggested tax rates are as follows:

- SOx €1,000 (CZK 27,521) per tonne
- NOx €1,000 (CZK 27,521) per tonne
- PM_{10} €2,000 (CZK 55,042) per tonne

Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates are then held constant in real terms. These may also assist in ensuring that stationary sources meet proposed BAT AELs under the Industrial Emissions Directive.

- **Water abstraction:** A central theme of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*. The water exploitation index (Eurostat) measures the total fresh water abstraction divided by the long term average available water (LTAA) expressed as a percentage. The Czech Republic had a water exploitation index of 12% in 2011, somewhat below the warning threshold of 20%, at which point a region is defined as "water scarce".[209] The Czech Republic already has a water abstraction charge, though the extent to which cost recovery is achieved is unclear. It is suggested that the existing fee is increased to a level, for public water supply, of €190 per 1,000m^3, with lower rates applied to abstraction for manufacturing purposes and for agriculture (€115 per 1,000m^3 and €16 per 1,000m^3 respectively). A transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. The rates are then held constant in real terms. It should be noted that the fact that revenues from the existing charges accrue to Environmental Funds does raise some questions as to how the revenues would be directed. In principle, it may be possible to consider the proposed rates as comprising an element of cost recovery, and a tax component, which accrues to the central government. This would clearly have implications for ongoing discussions regarding the reform of the management of the environmental funds, and the rationale for the charges.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and

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[208] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

[209] Eurostat (2014) *Resource Efficiency Scoreboard: Water Exploitation Index %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=t2020_rd200&tableSelection=1

discharges from certain industrial sectors.[210] The Czech Republic has waste water fees in place. To incentivise further prevention of water pollution it is suggested to increase the existing fee rate for BOD associated with treated waste water to €1.58per kg BOD. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels. Similar comments regarding the revenue from the suggested increase apply as for water abstraction. Revenues over and above levels required for recovery of costs could, subject to suitable arrangements, accrue to the central government.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  The Czech Republic's recently published Pesticide Action Plan has set quantitative reduction targets for the presence of pesticides in both food and water by 2020.[211] In addition, in connection with actions listed under Milestone 1(h) it is stated that the Ministry of Agriculture will *"analyse the possibility of introducing economic instruments, e.g. a sales tax on PP [plant protection] products unsuitable for use in systems of integrated pest management and to evaluate their real effect and impacts".*[212]

  Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in the Czech Republic. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €7.50 per kg active ingredient. The suggested transition period is from

[210] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

[211] The Ministry of Agriculture of the Czech Republic (2012) *The National Action Plan to Reduce the Use of Pesticides in the Czech Republic*, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_czech_republic_en.pdf, p.24-25

[212] The Ministry of Agriculture of the Czech Republic (2012) *The National Action Plan to Reduce the Use of Pesticides in the Czech Republic*, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_czech_republic_en.pdf, p.21

2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would support progress towards the targets and broader objectives set out in the National Pesticide Action Plan.

- **Fertilisers**: The Czech Republic does not currently implement a tax on nitrogen (or other) fertilisers. It is suggested that at a rate of €0.15 per kilogram of nitrogen be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study or previous studies are listed in Table 32. Further details of our calculation methodology are available in Appendix A.8.4, in which we also present a full list of subsidies for which no figures for forgone revenues are available. An example of an environmentally harmful subsidy in the Czech Republic is the favourable treatment of company cars in the tax system.[213,214] It would be useful to reduce these tax subsidies.

[213] Copenhagen Economics (2009) *Taxation Papers: Company Car Taxation*, Report for European Commission, November 2009, p.6, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf.

Note, however, that the study by Copenhagen Economics did not have any data for Bulgaria, Cyprus, Estonia, Ireland, Latvia, Lithuania, Malta, and Romania.

[214] European Commission (2013) *Tax Reforms in EU Member States 2013*, May 2013, p.73, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf

Table 32: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (CZK million, real 2013 terms)
ENERGY	
Excise tax exemption for electricity used for rail transport	32.1[1]
Energy tax refund for gas oil used for heating	531[2]
Excise tax refund for diesel used in agriculture	1,824[3]
Restructuring of the coal mining industry	1,565[3]
Payments of feed-in tariffs (FIT) and premiums for landfill gas and sewage gas used for electricity and heat	844[3]
Energy-tax exemption for certain uses of natural gas	1,560[2]
Energy-tax exemption for certain uses of solid fuels	916[2]
TRANSPORT (excl. transport fuels)	
Subsidies to company cars	9,693[4]
Total	16,966

Sources:

1) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*
2) *Amount involved stated in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 127-136, dx.doi.org/10.1787/9789264187610-en*
3) *Amount involved stated in: Table 4 in IEEP (2013) Steps to Greening Country Report: Czech Republic, Report for the European Commission, pp.13-14*
4) *Amount involved stated in: Table 3.6 in Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, p.28, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf*

These Tables give rise to the following comments:

- Payment of a FIT for energy generated from landfill gas is not environmentally harmful as such as long as the tax on landfill is set at a suitable rate. Such a FIT would encourage a) capture of landfill gas and b) energy generation from it, both of which seem desirable;
- The tax refund for gas oil used for heating is part of measures used to avoid fraud (from re-selling / mis-selling of gas-oil as transport fuel as opposed to heating fuel);
- The tax refund on diesel use in agriculture is intended to be phased out completely, though may be re-introduced in 2015 (see discussion above); and
- It may be that the estimate for tax foregone associated with company cars is high, as appears to be the case in some other countries.

It is not clear, therefore, that these amounts should be considered to their full extent in the calculation, though they have been included below. The actual figure might be closer to somewhere between a quarter and a half of the overall amount.

9.2.3 Summary of Revenue Outcomes

Table 33 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 33: Potential Additional Revenue from Environmental Fiscal Reform in Czech Republic, million CZK (real 2013 terms)[215]

Type	2016	2020	2025
Energy			
Transport fuels	1,819	8,879	14,005
C&I / Heating	2,204	6,398	6,398
Electricity	0	0	0
Sub-total Energy, million CZK	4,024	15,277	20,403
Sub-total Energy, % GDP	0.09%	0.32%	0.39%
Transport (excl. transport fuels)			
Vehicle Taxes	2324	12,888	14,370
Passenger Aviation Tax	6,465	13,917	15,597
Freight Aviation Tax	1.03	2.10	2.21
Sub-total Transport, million CZK	8,790	26,808	29,969
Sub-total Transport, % GDP	0.20%	0.57%	0.57%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	1,455	2,188	2,270
Landfill Tax - Inerts (C&D)	11	10	10
Incineration /MBT Tax	150	209	217
Air Pollution Tax	2,361	4,322	3,723

[215] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Water Abstraction Tax	687	1,393	1,227
Waste Water Tax	486	678	678
Pesticides Tax	519	1021	1065
Aggregates Tax	5,778	3,700	4,014
Packaging Tax	935	968	1,079
Single Use Bag Tax	6808	1474	1627
Fertiliser Tax	0.743	1.530	1.694
Sub-total Pollution & Resource, million CZK	19,190	15,965	15,913
Sub-total Pollution & Resources, % GDP	0.44%	0.34%	0.30%
Total Environmental Taxes			
Total, million CZK	32,004	58,050	66,285
Total Increase, % GDP	0.74%	1.23%	1.26%
Total Environmental Harmful Subsidies			
Total, million CZK	16,966	16,966	16,966
Total Increase, % GDP	0.41%	0.40%	0.39%
Total Potential for Environmental Fiscal Reform			
Total, million CZK	**48,970**	**75,016**	**83,251**
Total Increase, % GDP	**1.15%**	**1.63%**	**1.65%**

9.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from the change in demand estimates as a result of increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, CZK 3.1 billion of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to a significant increase in the tax rate for coal use for heating, and the resultant fall in demand for coal, reduction emissions of air pollutants and a reduction in landfilling.

Table 34: Monetised Environmental Benefits from Implementation of Taxes, million CZK (real 2013 terms)

Tax Type	2016	2020	2025
Energy	237	691	736
Transport	115	286	306
Pollution & Resources	738	2,227	2,051
Total, million CZK	1,090	3,205	3,093
Total, % GDP	0.03%	0.08%	0.07%

9.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in the Czech Republic:[216]

- In 2012 environmental taxes generated revenue equivalent to 2.35% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **CZK 32 billion (€1.2 billion)** in 2016, rising to **CZK 66 billion (€2.4 billion)** in 2025 (both in real 2013 terms). This is equivalent to **0.74%** and **1.26%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be **CZK 17 billion (€0.6 billion)** in 2016 (real 2013 terms), equivalent to **0.41%** of GDP, though this may be a considerable overestimate for some of the reasons discussed above.
- The greatest amount of revenue could be gained from the introduction of a tax on passenger flights. Such a tax could yield an estimated **CZK 16 billion (€0.57 billion)** by 2025 (real 2013 terms), equivalent to **0.27%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- The second largest revenue stream comes from suggested changes in vehicle taxation. This accounts for **CZK 14 billion (€0.52 billion)** by 2025 (real 2013 terms), equivalent to **0.25%** of GDP. In line with the country specific recommendation in last year's European Semester process, an increase in the existing circulation tax was suggested, with the tax

[216] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

base potentially including particulate matter (as well as CO_2 emissions) to help foster improvements in air quality.

- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **CZK 14 billion (€0.51 billion)** of additional revenue in 2025 (real 2013 terms), equivalent to **0.24%** of GDP.
- The suggested changes to the excise duties charged for fuels used by businesses for heating could result in **CZK 6.4 billion (€0.23 billion)** of additional revenue in 2025 (real 2013 terms), equivalent to **0.11%** of GDP.
- A tax on the extraction of aggregates in the Czech Republic could yield **CZK 4 billion (€0.15 billion)** in 2025 (real 2013 terms), equivalent to **0.07%** of GDP.
- In addition, minor taxes on, *inter alia*, air pollution, the landfilling of non-hazardous residual waste, water abstraction, single use plastic bags, and water abstraction, could generate revenue of **CZK 12 billion (€0.43 billion)** by 2025 (real 2013 terms), equivalent to **0.2%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **CZK 3.1 billion (€0.11 billion)** in 2025 (real 2013 terms), or **0.07%** of GDP.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *Reduce the high level of taxation on labour by shifting taxation to areas less detrimental to growth, such as recurrent taxes on housing and vehicle circulation taxes.*

The above package, or elements thereof, would clearly help to meet the objective in respect of environmental taxes.

10.0 Estonia

10.1 Country Overview

10.1.1 Key Facts about the Economy and Tax System

- Estonia experienced considerable growth between 2002 and 2007, with GDP growing at an average rate of 7.8% per annum in real terms.[217]
- The financial crisis had a significant impact on the economy of Estonia, resulting in a decline in GDP of 4.2% in 2008 and a very sharp fall of 14% in 2009, in real terms.[218] The economy returned to growth in 2010.[219]
- Estonia's overall tax revenue (including social contributions) amounted to 32% of GDP in 2012, a slight drop from the peak contribution of 35% in 2009, and higher than in the other Baltic States.[220]
- As in many other new Member States, the share of indirect taxes in total taxation is relatively high, at 43% in 2011 (the latest year for which data from Eurostat is available). Social contributions also form a large proportion of total taxation (38%). The share of direct taxes (20%) has fallen around ten percentage points since the late 1990s, following reforms that increased the basic allowance and decreased the tax rates on both personal and corporate income.[221]
- Environmental taxes comprised 2.78% of GDP in 2012. This is a slight drop in comparison to the two previous years in percentage terms, although a significantly higher proportion than in 2004 (2.1% of GDP).[222] This reflects, both the need to increase some excise duties up to EU minimum rates, and also, a deliberate policy of the government to finance cuts in personal income taxes through increases in taxes on consumption and environmental taxes.
- In 2012, the largest proportion of environmentally-related taxation was realised through energy taxes, at 2.45% of GDP. Taxes on pollution and resources (referred to as charges according to the National Environment Charges Act) account for 0.27% of GDP whilst

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[217] Eurostat (2013) *Real GDP Growth Rate – Volume,* 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[218] Eurostat (2013) *Real GDP Growth Rate – Volume,* 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[219] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

[220] Eurostat (2013) *Main National Account Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[221] Eurostat (2013) *Main National Account Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[222] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

taxes on transport (excl. transport fuels) account for 0.06% of GDP.[223] This pattern is unusual among Member States, for most of whom, the second largest contribution comes from transport taxes.

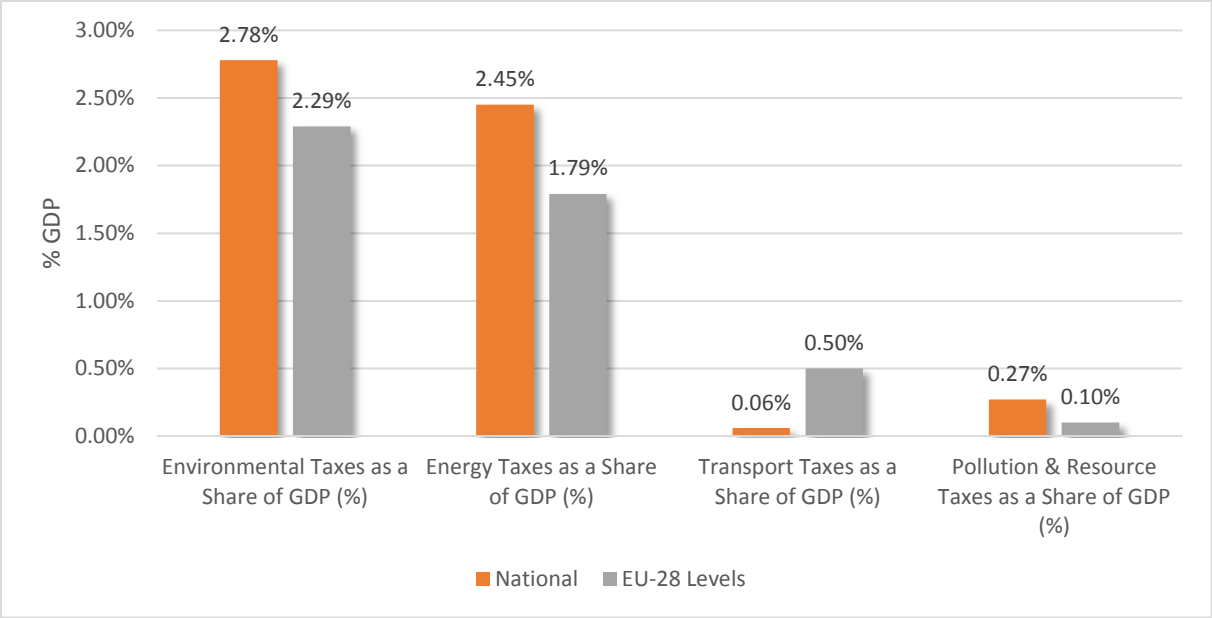
- The increase in revenue realised from environmentally-related taxes can be traced principally to a 40% increase in energy tax rates between 2001 and 2012. Conversely, revenue from taxes on transport (excl. transport fuels) and pollution and resources, as a % of GDP, both declined over this period.[224]

10.1.2 Relative Position within the EU

Estonia's position relative to the other 28 Member States is summarised in Figure 5 and Table 17 below:

- Figure 5 shows that revenues derived from environmental taxes, as a proportion of GDP, were above the EU-28 level of 2.29%. Similarly, revenues from energy/pollution and resource taxes were also significantly above EU-28 levels. Taxes on transport (excl. transport fuels), however, were, at 0.06% of GDP, well below the EU-28 level of 0.50% GDP. [225]

Figure 5: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

[223] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[224] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[225] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

- In terms of revenues derived from all environmental taxes as a proportion of GDP, Estonia was ranked 10th in the EU-28 in 2012. As regards revenues from taxes on energy, expressed as a proportion of GDP, Estonia ranked 3rd highest in the EU-28. In terms of revenues derived transport taxes (excl. transport fuels) the country ranked 27th in the EU-28, whereas for pollution and resource taxes, it ranked 4th overall (Table 17).[226]

Table 35: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	10
Energy Taxes as a Share of GDP (%)	3
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	27
Pollution & Resource Taxes as a Share of GDP (%)	4

Source: based on Eurostat data

10.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax are given in the Appendix (the Appendix also includes a detailed list of references for all of the information cited in this section). This section summarises key aspects of the main environmental taxes, and describes, for energy, how the rates compare with European averages, and with the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[227,228]

- **Energy:** The Estonian excise duties on fuels and electricity are shown in Table 36, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

Table 36: Standard Rates of Excise Duties on Fuels and Electricity in Estonia

Excise Duty	Unit	Rate Applied in Estonia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1,000 litres	€423	€421	€580	€583
Unleaded Petrol	€ per 1,000 litres	€423	€359	€536	€515

[226] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[227] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[228] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Estonia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	€ per 1,000 litres	€393	€330	€425	€412
Kerosene	€ per 1,000 litres	€330	€330	€434	€410
Liquid Petroleum Gas	€ per 1,000 kg	€125	€125	€197	€176
Natural Gas	€ per GJ	-	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1,000 litres	€111	€21	€233	€242
Kerosene	€ per 1,000 litres	€330	€21	€300	€330
Liquid Petroleum Gas	€ per 1,000 kg	€125	€41	€134	€125
Natural Gas	€ per GJ	-	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	€ per 1,000 litres	€111	€21	€178	€122
Kerosene	€ per 1,000 litres	€330	€0.00	€265	€330
Heavy Fuel Oil	€ per 1,000 kg	€15	€15	€71	€25
Liquid Petroleum Gas	€ per 1,000 kg	€0	€0.00	€78	€42
Natural Gas	€ per GJ	€0.70	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€0.30	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1,000 litres	€111	€21	€185	€123
Kerosene	€ per 1,000 litres	€330	€0.00	€275	€330
Heavy Fuel Oil	€ per 1,000 kg	€15	€15	€75	€25
Liquid Petroleum Gas	€ per 1,000 kg	€0	€0.00	€110	€43
Natural Gas	€ per GJ	€0.70	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€0.30	€0.30	€1.69	€0.32
Electricity					
Business Use	€ per MWh	€4.47	€0.50	€10.23	€1.21

Excise Duty	Unit	Rate Applied in Estonia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Non-Business Use	€ per MWh	€4.47	€1.00	€14.68	€1.91

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- In Estonia the general approach has been to homogenise rates across different fuels, and for some fuel uses, the rates are well above the minimum stipulated in the existing ETD. The majority of rates, however, are below the EU-28 average and median values.
- For transport fuels, the differentials are relatively small between unleaded petrol and diesel (of the same order as indicated in the existing ETD).
- Electricity duties are set well above the EU-28 average level.
- Revenues in 2012 from fuel excise duties were €394 million (equivalent to 2.3% of GDP). Revenues from duties on electricity in 2012 were €33 million (equivalent to 0.19% of GDP).

➢ **Transport (excl. transport fuels):**

- There is a vehicle registration fee in Estonia which applies to personal vehicles and is based upon either the type of vehicle or the country of origin. This tax generated revenue of €6.9 million (equivalent to 0.04% of GDP) in 2012.
- Estonia also has a circulation tax for heavy goods vehicles. The circulation tax for heavy goods vehicles varies according to the type of vehicle (i.e. by the number of axles, the weight of the vehicle and the type of suspension). In 2012 revenues of €3.9 million (equivalent to 0.02% of GDP) were received from circulation taxes.

➢ **Pollution and resources:**

- A waste disposal charge for all non-hazardous wastes is applied, with rates set to rise to €30 per tonne of waste landfilled in 2015 (in nominal terms).[229]
- There is an air pollution charge with rates charged per tonne of pollutant emitted into the atmosphere. Taxes are applied for the following pollutants: sulphur oxides, carbon monoxide, particulates (except heavy metals and compounds of heavy metal), nitrogen oxides, volatile organic compounds (except mercaptans and methane), mercaptans and heavy metals and compounds of heavy metals). By way of example, the rate for SOx will be €145 per tonne in 2015 (in nominal terms).
- Estonia has a water pollution charge with rates charged upon discharging one tonne of different pollutants into a water body, groundwater or soil.

[229] Note, there are separate high charge/tax for landfilling hazardous waste and separate tax for landfilling waste generated from oil shale processing (oil shale incineration ash, processing waste/semi-coke and oil shale mining waste).

- Total revenue from air and water pollution and waste disposal charges in 2012 was just under €32 million (equivalent to 0.19% of GDP).[230] The contribution from each of the components listed above is not entirely clear (the figures differ by source), but according to the Ministry of Environment, in 2012, revenues were €16 million from the landfill tax (0.1% GDP), €10 million from air pollution taxes (0.06% GDP) and €5 million from water pollution taxes (0.03% GDP). The above taxes are increasing annually, with rates fixed for the period 2010 to 2015.
- A water extraction charge is applied in Estonia with differentiated rates depending on whether the extraction is from surface or ground water. Further differentiation is in place setting higher rates for water extracted from the Tallinn water system, but lower rates for water extracted for cooling. The higher rates for surface water and groundwater extraction are around €40 to €170 per 1,000m^3 respectively. Revenue from the Estonian charge on the extraction of water was €13 million in 2012 (equivalent to 0.008% of GDP).
- There is a packaging excise duty is in place within Estonia. It should be noted that this duty is payable only by those organisations who failed to meet their obligations to collect and recycle /recover waste. As most producers comply (the rates are deliberately high to encourage this), the revenues raised are rather small. It may be considered a means to encourage compliance / participation in relevant schemes. In 2012, revenue from the packaging excise duty on raised €0.3 million (equivalent to 0.002% of GDP).[231] It should be noted that there is also a deposit refund scheme in place in Estonia for beverage packaging.
- A mineral resources extraction charge is paid for the extraction of mineral resources in Estonia. The charge applies to various materials and is based on the final use of the material. The following minerals are covered by the charge: dolomite, building stone, gravel, sand, limestone, clay, peat, phosphate rock, and shale oil (see the Appendix for more details).
- There are other minor environmental fees or charges in Estonia on fishing, hunting and forest cutting. Further details can be found in the Appendix.

➢ **Environmentally Harmful Subsidies (EHSs):** A number of EHSs have been identified from work undertaken by IEEP and OECD, and from Excise Duty Tables, with additional information obtained through private communication with the Stockholm Environment Institute Tallinn Centre.[232,233,234] Subsidies for which actual or calculated revenues

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[230] Data obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia.

[231] Data obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia.

[232] See Table 3 in IEEP (2013) Steps to Greening Country Report: Estonia, Report for the European Commission, pp.11-12.

[233] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 143-152, dx.doi.org/10.1787/9789264187610-en

[234] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1* July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

forgone/amounts spent are available are listed in Section 10.2.2 (all subsidies are detailed in Appendix A.9.5). The main subsidies can be summarised as follows:

- An excise duty reduction for diesel fuel and light heating oil used for special purposes;
- An excise tax exemption for fuels used in aviation.

10.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Estonia. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes. Outturns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

10.2.1 Current Status of EFR

Environmental taxes have been applied in Estonia since 1991. In June 2005, the Government adopted a document entitled the Basis for Ecological Fiscal Reform (EFR).The Governments since 2005 have declared their intention to follow the principles of EFR.

In 2005, a new Act on Environmental Charges was adopted by Parliament which merged various existing acts regulating the calculation, payment and use of revenues related to fees on resource use and pollution for the period of 2006 to 2010. As a general principle, most environment tax rates increased at a rate of 10% to 20% per annum.

In Phase I of the implementation of the EFR – that is, from January 2006 to 2010 – rates for most of the resource use and pollution charges increased significantly (many almost doubling), and a new excise tax for electricity was introduced. In the spirit of EFR, personal income tax was gradually reduced over the same period from 24% to 21% (at a gradual reduction of 1% per annum).

In the period 2007 to 2008, with broad participation of various stakeholders, the Ministry of Environment prepared a document entitled *'Concept for Development of Environment Charges, 2010-2020'*. This reinforced the principles behind the resource use and pollution taxes. The document also made recommendations for the strengthening of market based instruments for sustainable development, and set out the rates to be applied until the end of 2015. The concept has been discussed in Government, and the increased charges / fees set out in it were implemented as Phase II of EFR, but the document itself was never officially adopted.

As part of the implementation of Phase II of EFR, and in order to increase revenues following the 2009 fiscal crisis, new rates for environmental taxes were adopted by the Parliament for the period of 2010 to 2015. Through the amendment of the Environment Charges Act, rates for almost all environmental charges increased within the limits stipulated in the Concept of Environment Charges mentioned above. Due to budgetary constraints, an earlier decision gradually to reduce personal income tax rates down to 18% was revoked, and the tax rate was frozen at 21%.

In conjunction with the adoption of the State Budget for 2013 it was decided in the Parliament to raise tariffs for certain environmental charges from April 2013 until the end of 2015. Collection of charges was undertaken in the second and third quarters of 2013; however, the High Supreme Court, with its decision on 16th December 2013, revoked the rise in charges, therefore the levels which were agreed in 2009 remain valid.

An interesting feature of the Estonian environmental tax system is how much revenue, in relative terms, is generated from taxes on pollution and resources, and how little is raised from

taxation of transport (excluding transport fuels). This latter point was picked up in a country-specific recommendation for Estonia as part of the 2013 European Semester:

> **Recommendation 4:** *Improve energy efficiency, in particular in buildings and transport, and strengthen environmental incentives concerning vehicles and waste. Step up the development of cross-border energy connections to diversify energy sources and promote competition in the energy market.*

Unsurprisingly, this is a key area for changes to the tax system suggested below.

10.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

<u>Adjustments to existing taxes or new taxes:</u>

- **Energy Taxes:**
  - It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO_2 price. Transport fuels are equalised using the energy content on petrol (€11.5 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€7.9 per GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate of €0.15 per GJ. Note that this implies a reduction in the existing rate for kerosene from €330 to €56 per 1,000 litres and gas oil from €111 to 57 per 1,000 litres, however, for the purposes of this analysis the existing rates have been maintained.
  - Table 37 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 37: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	423	423
Light fuel oil (diesel)	€/1000 litre	457	393
LPG (propellant)	€/1000 kg	588	125
Kerosene	€/1000 litre	459	330
Natural gas (prop)	€/GJ	13	0
INDUSTRY AND COMMERCIAL MOTORS			

	Units	Suggested Rates	Existing Rates
Gas oil	€/1000 litre	328	111
Kerosene	€/1000 litre	330	330
LPG	€/1000 kg	420	125
Natural gas	€/GJ	9	0
BUSINESS HEATING			
Gas oil	€/1000 litre	111	111
Heavy fuel oil and Oil Shale oil	€/1000 kg	68	15
Kerosene	€/1000 litre	330	330
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.70
Coal and Oil shale	€/GJ	2.04	0.30
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	111	111
Heavy fuel oil and Oil Shale oil	€/1000 kg	68	15
Kerosene	€/1000 litre	330	330
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.70
Coal and Oil Shale	€/GJ	2.04	0.30
ELECTRICITY			
Electricity - business use	€/MWh	4.47	4.47
Electricity - non-business use	€/MWh	4.47	4.47

- **Transport Taxes (excl. transport taxes):**
  - **Vehicles:** The taxes on transport in Estonia are among the lowest in the EU (0.06% of GDP compared to the EU-28 level of 0.50% GDP). Scope exists for introducing vehicle taxation, as a means for raising revenue but also for differentiating between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. Our understanding is that the concept paper for EFR has proposed such taxes, but no such taxes have been implemented thus far. It is suggested that Estonia could readily increase vehicle taxation by at least 0.55% of GDP. Car ownership is increasing in every income group and the new

vehicles bought in Estonia are among the most inefficient in the EU. A circulation tax differentiated by CO_2 emissions could be introduced with this in mind, with inclusion of company cars and private vehicles within the scheme. This figure is applied to future projections of real GDP in order to calculate revenue potential in future years. The increase is phased in over the period from 2015 to 2020.

- **Aviation:** Currently there is no aviation tax in Estonia. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Estonia, €25 per passenger to flights to other countries in the EU and €50 per passenger to flights to other countries outside the EU. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➢ **Pollution and Resource Taxes:**

- **Waste – landfill tax:** The level of landfill charge applied to non-hazardous waste in Estonia is set to rise to €29.84 per tonne in 2015 (in nominal terms) from its current level of €24.86 per tonne (this rate also applies to construction and demolition waste).[235] Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Estonia has significantly reduced landfilled quantities, and indeed, it may have excess capacity for treating residual waste now that the incinerator in talinn has commenced operation. Further gains appear possible in respect of the movement of waste higher up the hierarchy, however. Indeed, Estonia's new Waste Management Plan seeks to increase separate collection of biowaste. Further increases in the tax, and the extension of the tax to other residual waste treatments such as incineration and MBT (see below), would help incentivise further change in the waste management sector. Therefore, it is suggested to increase the rate of landfill charge for non-hazardous wastes to €50 per tonne in 2017 and index rates thereafter so that the tax remains constant in real terms. It might be that this has limited effect on the quantity landfilled, which is already low, but the combined effect of higher taxes on landfill and other residual waste treatments should help improve the economics of recycling. As such, this should be seen as part of a package alongside the tax discussed below on incineration /

[235] The landfill charge for construction and demolition waste containing asbestos is €0.63 per tonne in order to prevent the illegal dumping of asbestos containing materials.

MBT. Given the already high level of tax on construction wastes, no increase is suggested.

- **Aggregates:** There is currently no separate tax on aggregates in Estonia, but extraction charges on minerals are differentiated according to the use of minerals – there are lower rates for extraction of minerals used for filling than for construction and/or manufacturing. An average figure of around €0.25 per tonne extracted has been used to estimate baseline revenues. Aggregates taxes can help reduce extraction rates for aggregates, and stimulates the market for the use of secondary materials.[236] The instrument works well alongside taxes for landfilling of construction and demolition wastes. This approach is aligned with the Roadmap to A Resource Efficient Europe.[237] The existing rates in Estonia could be raised to further incentivise use of secondary aggregates. It is suggested that Estonia implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this, keeps rates constant in real terms. This tax would then replace the existing mineral extraction charge on certain materials (these charges are currently well below €2.40 per tonne). The types of materials that could be covered by the tax are:
    - Marble
    - Chalk and dolomite
    - Slate
    - Limestone and gypsum
    - Sand and gravel

  Not all of these are extracted in Estonia. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues;

- **Waste – incineration / MBT tax:** A new incinerator has just commenced operation in Estonia, and several MBT plants, focusing mainly on fuel production, are operational. In order to ensure that mixed municipal wastes are not simply shifted from landfill to incineration or MBT, and to further enhance recycling of wastes *(and incentivise prevention and re-use), it is suggested that a tax on incineration and other residual waste treatments is introduced, at €15 per tonne in 2017.

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is worth noting that Estonia has deposit refund schemes in place for refillable and one-way beverage packaging which drives the recycling of beverage packaging

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[236] European Environment Agency (2008) *Effectiveness of Environmental Taxes and Charges for Managing Sand, Gravel and Rock Extraction in Selected EU Countries*, June 2008, www.eea.europa.eu/publications/eea_report_2008_2

[237] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

and appears to have maintained a higher share of refillable packaging than in other countries. However, other than in this respect, waste minimisation from packaging producers is not the subject of specific incentives. There is a packaging excise duty in place, but this is exempted if producers register with PRO schemes for the recovery of waste packaging. As a result, it is suggested to apply rates of the following order to all packaging placed on the market in Estonia (other than that subject to the deposit):

- Aluminium €197 per tonne
- Plastic €64 per tonne
- Steel €54 per tonne
- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

It should be noted that this could be achieved through making the following proportions of the existing excise duty mandatory:

- Paper and card 1.7%
- Plastic 2.6%
- Wood 1.1%
- Metallic 4.0%
- Glass 3.0%

This (or a uniform rate of around 3%) may be a simpler way to introduce such a tax.

- **Single-use carrier bag tax**: There is currently no tax on single-use plastic bags in Estonia, although consumers may pay for larger bags. Plastic bags cause many environmental problems when littered in the environment, especially when then end up in the marine environment. Taxing single-use plastic bags significantly influences consumers purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[238] Therefore, it is suggested that Estonia implements a tax on single-use plastic bags

[238] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

at a rate of €0.07 per bag from 2016, and following this to keep the rate constant in real terms.

- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies, and therefore improve local air quality and the health of the population. Estonia has a system of air pollution charges in place, and rates are set to increase between now and 2015. There have been notable improvements in air quality, but some issues remain in urban areas (especially in Tallinn and Kohtla-Järve).[239] It is suggested the planned rates could be increased further to generated additional improvements in air quality as follows:
    - SOx €1,000 per tonne
    - NOx €1,000 per tonne
    - PM10 €2,000 per tonne

  Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates are then held constant in real terms.

- **Water abstraction:** A central tenet of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs".* Estonia already has water abstraction fees in place differentiated according to the water source and quality, but the extent to which it covers all relevant costs is unclear. Recent analysis of the effects of Estonian environmental charges suggested that there was no urgent need for an increase in the water abstraction fee other than through indexing to relevant measure of inflation (water use has decreased in most of Estonia's groundwater layers). A key exception was thought to be in respect of mining water and cooling water. However, in order to further improve efficiency in the usage of the water supply system it is suggested that the existing rates are increased to levels of €190 per 1,000 m^3 for the public water supply, €120 per m^3 for manufacturing purposes and €16 per m^3 for the agriculture sector. A transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. The rates should then be held constant in real terms.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[240] Estonia has waste water charges with the rate for organic material at €1.435 per kg BOD. To improve prevention of

[239] Statistics Estonia. Database No KK027. http://pub.stat.ee/px-web.2001/ cited in IEEP (2013) *Monitoring Member States' achievements in selected environmental policy areas: Estonia*, p.26

[240] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

water pollution it is suggested to implement a waste water tax and adjust tax rates in-line with 'good practice'. With relative price levels in the Estonia this would imply a rate of €1.60 per kg BOD. For fresh-water discharges, existing phosphorus rates should also be increased by the same order of magnitude. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  Estonia published its Action Plan for the Sustainable Use of Plant Protection Products in February 2013.[241] As the plan states:

  > *"If we compare the data on the plant protection products marketed in the countries of the so-called Old Europe with the data on Estonia, we can see that this country still has a long way to go, but even so, the quantities marketed in Estonia show a tendency towards continuous growth and it is hence justified that the aspects of the usage of plant protection products are addressed".*

  Although objective reduction targets have not been set, the Plan recognises the need to protect the environment and human health. Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Estonia. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €2.50 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan.

[241] Ministry of Agriculture (2013) *Action Plan for the Sustainable Use of Plant Protection Products,* 28 February 2013, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_estonia_en.pdf

- **Fertilisers**: There is currently no tax of fertilisers in Estonia. Intensification of the agriculture and increased use of mineral fertilisers cause leakage of nutrients into the environment and eutrophication. Eutrophication is the major environmental concern in the Baltic Sea. The whole territory of Estonia is part of the catchment area of the Baltic Sea. It is therefore suggested that a tax on the use of non-organic nitrogen in fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that a rate of €0.05 per kilogram of nitrogen be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study or previous studies, are listed in Table 32. Further details of our calculation methodology are available in Appendix A.9.5, in which we also present a full list of subsidies for which no figures for forgone revenues are available.

Table 38: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (€ million, real 2013 terms)
ENERGY	
Excise tax exemption for gas oil used as motor fuel for agricultural purposes	26.2[1] – 86.2[2]
Excise tax exemption for gas oil used for rail transport	11.6[1]
Excise tax exemption for domestic navigation	1.7[1]
Excise tax exemption for fuels used in aviation	15[3]
Excise duty exemption for shale oil used in district heating	0.6[2]
Direct project grants to oil-shale based electricity and heat production	3.8[2]
POLLUTION & RESOURCES	
Direct project grants to producers of shale-derived oil	0.8[2]
Total	59.5 - 120

Notes:

1) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*
2) *Amount involved stated in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 143-152, dx.doi.org/10.1787/9789264187610-en*
3) *Calculated based on exemption description in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 143-152, dx.doi.org/10.1787/9789264187610-en*

10.2.3 Summary of Revenue Outcomes

Table 39 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change

in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 39: Potential Additional Revenue from Environmental Fiscal Reform in Estonia, million EUR (real 2013 terms)[242]

Type	2016	2020	2025
Energy			
Transport fuels	4	21	34
C&I / Heating	7	23	27
Electricity	0	0	0
Sub-total Energy, million EUR	11	44	60
Sub-total Energy, % GDP	0.06%	0.19%	0.21%
Transport (excl. transport fuels)			
Vehicle Taxes	23	132	160
Passenger Aviation Tax	35	80	95
Freight Aviation Tax	0.02	0.03	0.04
Sub-total Transport, million EUR	57	212	255
Sub-total Transport, % GDP	0.28%	0.89%	0.88%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	25	44	46
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	2	3	3
Air Pollution Tax	31	60	53
Water Abstraction Tax	9	21	22

[242] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Waste Water Tax	0	1	1
Pesticides Tax	1	2	2
Aggregates Tax	25	15	16
Packaging Tax	9	9	10
Single Use Bag Tax	13	3	3
Fertiliser Tax	0.001	0.002	0.002
Sub-total Pollution & Resource, million EUR	114	157	156
Sub-total Pollution & Resources, % GDP	0.55%	0.65%	0.54%
Total Environmental Taxes			
Total, million EUR	183	413	472
Total Increase, % GDP	0.89%	1.73%	1.63%
Total Environmental Harmful Subsidies			
Total, million EUR	90	90	90
Total Increase, % GDP	0.47%	0.45%	0.44%
Total Potential for Environmental Fiscal Reform			
Total, million EUR	**272**	**503**	**562**
Total Increase, % GDP	**1.36%**	**2.18%**	**2.06%**

10.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, EUR 110 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in SOx, NOx and PM10 emissions, reductions in the use of coal and reduced reliance on landfills.

Table 40: Monetised Environmental Benefits from Implementation of Taxes, million EUR (real 2013 terms)

Tax Type	2016	2020	2025
Energy	2	5	6
Transport	2	5	5
Pollution & Resources	26	109	99
Total, million EUR	30	120	110
Total, % GDP	0.15%	0.56%	0.48%

10.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Estonia:[243]

- In 2012 environmental taxes generated revenue equivalent to 2.78% of GDP. The headline figures suggest that there is potential for additional revenue from environmental taxes. These taxes could generate an additional **€0.18 billion** in 2016, rising to **€0.47 billion** in 2025 (both in real 2013 terms). This is equivalent to **0.9%** and **1.63%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be between **€0.06 billion** and **€0.12 billion** in 2016 (real 2013 terms), equivalent to **0.31%** to **0.63%** of GDP (the average rate is shown in Table 39 above).
- The largest single contribution comes from suggested changes in vehicle taxation. This accounts for **€0.16 billion** by 2025 (real 2013 terms), equivalent to **0.37%** of GDP. It was suggested that the increase in taxation should focus on the circulation tax with these being differentiated according to the environmental performance of the vehicles.
- The suggested introduction of a tax on passenger flights could yield **€0.10 billion** by 2025 (real 2013 terms), equivalent to **0.22%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.

[243] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

- The suggested increases in the rates of the existing tax on air pollutants could yield an additional **€0.05 billion** by 2025 (real 2013 terms), equivalent to **0.12%** of GDP.
- The suggested increase in Estonia's landfill charge for the landfilling of non-hazardous residual waste could yield an additional **€0.05 billion** in 2025 (real 2013 terms), equivalent to **0.11%** of GDP.
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **€0.03 billion** of additional revenue in 2025 (real 2013 terms), equivalent to **0.08%** of GDP.
- In addition, minor taxes on, *inter alia*, water abstraction, the extraction of aggregates, packaging, and single use plastic carrier bags, could generate revenue of **€0.12 billion** by 2025 (real 2013 terms), equivalent to **0.27%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **€0.11 billion** (real 2013 terms), or **0.48%** of GDP in 2025.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *... strengthen environmental incentives concerning vehicles and waste.*

  The above package, or elements thereof, would clearly help to meet these objectives.

11.0 France

11.1 Country Overview

11.1.1 Key Facts about the Economy and Tax System

- France's GDP showed steady growth between 2004 and 2007, averaging 2.3% growth per annum in real terms.[244]
- The effects of the financial crisis were not as profound in France as in some other Member States: GDP fell by 0.1% and 3.1% in real terms in 2008 and 2009, respectively (the average EU-28 performance was a drop in GDP of 5.8% in 2009).[245] The economy returned to growth in 2010.[246]
- France's overall tax revenue (including social contributions) is relatively high at 46.7% of GDP (2012). This has stayed relatively constant over the past decade, ranging from a low of 43.9% in 2009 to the high figure observed in 2012.[247]
- In 2012, the largest proportion of tax in France (41%) was realised through social security contributions. Indirect and direct taxation comprised shares of 32.9% and 26.5% respectively.[248]
- In 2012, revenue from environmental taxes was equivalent to 1.83% of GDP. This has decreased overall since 2001.[249] The 2012 figure is some way below the EU average (see Figure 6 below).[250]
- In 2012, the largest proportion of environmental tax revenues were collected through taxes on energy, at 1.47% of GDP. This has decreased slightly since 2001, and is below the level for the EU-28. Transport taxes (excl. transport fuels) comprised 0.24% of GDP in the same year, again, well below the level for the EU-28. This proportion rose between 2003 and 2008, since when, it has levelled off. This is important in understanding the modest share of environmental taxes in France. Taxes on pollution and resources made

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[244] Eurostat (2014) Real GDP Growth Rate - Volume, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[245] Eurostat (2013) Real GDP Growth Rate – Volume, 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[246] Eurostat (2013) GDP and Main Components - Current Prices [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

[247] *Eurostat (2013) Main national accounts tax aggregates [gov_a_tax_ag], Accessed 29 November 2013,* http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[248] *Eurostat (2013) Main national accounts tax aggregates [gov_a_tax_ag], Accessed 29 November 2013,* http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[249] *Eurostat (2013) Environmental tax revenues, [env_ac_tax], Accessed 29 November 2013,* http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[250] Following the introduction of the carbon tax in December 2013, this may rise with 0.2% by 2015.

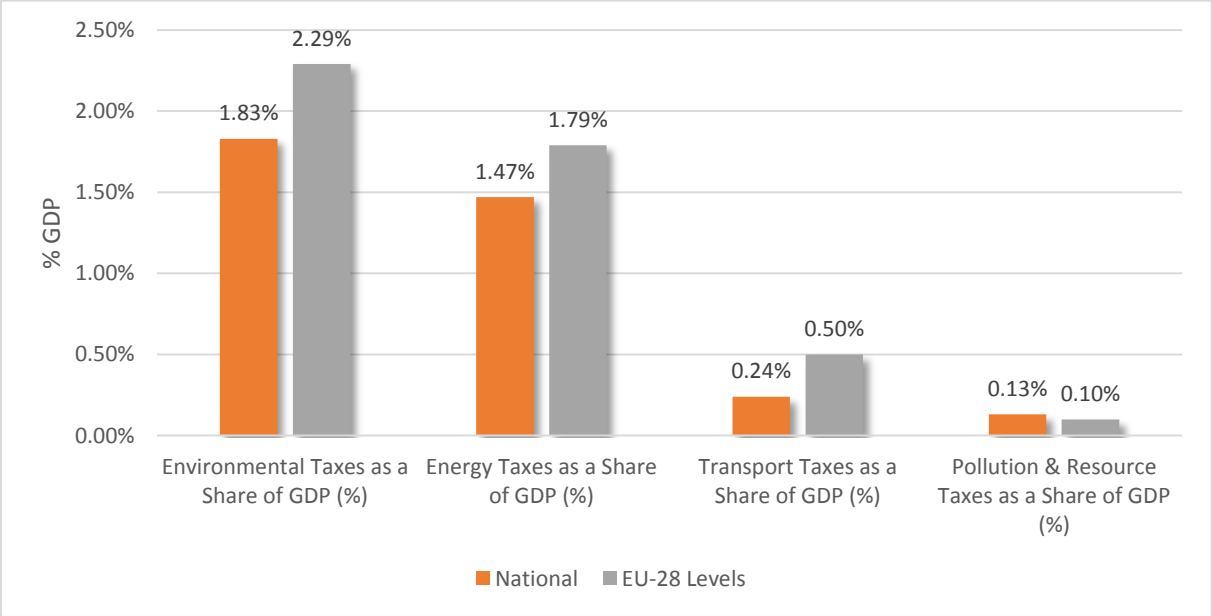
up 0.13% of GDP. This has stayed relatively constant over the past decade, and is slightly higher than the level for the EU-28.[251]

11.1.2 Relative Position within the EU

France's position relative to the other 28 Member States is summarised in Figure 6 and Table 41 below. It can be seen that:

- For all types of environmental taxes France is below or equal to EU-28 levels.
- In terms of environmental tax revenues as a percentage of GDP, France is ranked in 25th place. France is also ranked 25th in terms of energy taxes by the same measure, these making up the largest proportion of the environmental tax revenues. In terms of transport taxes (excl. transport fuels) and resource/pollution taxes France is ranked in 21st and 10th places, respectively (see Table 59).[252]

Figure 6: Environmental Taxes in France as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

[251] Eurostat (2013) Environmental tax revenues, [env_ac_tax], Accessed 29 November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[252] *Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014,* http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Table 41: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	25
Energy Taxes as a Share of GDP (%)	25
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	21
Pollution & Resource Taxes as a Share of GDP (%)	10

Source: based on Eurostat data

11.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The structure and rates for each tax, as well as full references, are given in the Appendix. This section summarises key aspects of the main environmental taxes, and, for energy, describes how the rates compare with European averages and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[253,254]

- **Energy:** The French excise duties on fuels and electricity are shown in Table 24, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

Table 42: Standard Rates of Excise Duties on Fuels and Electricity in France

Excise Duty	Unit	Rate Applied in France	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Unleaded Petrol[1]	€ per 1000 litres	€606.90[2]	€359	€536	€515
Gas Oil (Diesel)	€ per 1000 litres	€428.40[2]	€330	€425	€412
Kerosene	€ per 1000 litres	€416.90	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	€107.60	€125	€197	€176
Natural Gas	€ per GJ	€0	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					

[253] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[254] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in France	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	€ per 1000 litres	€72	€21	€233	€242
Kerosene	€ per 1000 litres	€25.40	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	€46.80	€41	€134	€125
Natural Gas	€ per GJ	€0.33	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€56.60	€21	€178	€122
Kerosene	€ per 1000 litres	€56.60	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	€18.50	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	€0	€0.00	€78	€42
Natural Gas	€ per GJ	€0.33	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€0.33	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€56.60	€21	€185	€123
Kerosene	€ per 1000 litres	€56.60	€0.00	€275	€330
Heavy Fuel Oil	€ per 1000 kg	€18.50	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	€0	€0.00	€110	€43
Natural Gas	€ per GJ	€0	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€0	€0.30	€1.69	€0.32
Electricity[3]					
Business Use	€ per MWh	€17.03	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	€25.23	€1.00	€14.68	€1.91

Notes:

1. This rate is for <95 octane. The rate for "unleaded substitute petrol" is €639.60.

2. For petrol €612.5 and for gas oil (diesel) €439.5 when including a second tranche of regional surtaxes that appears not to have been included in reporting to the Commission's Excise Tables. [255]

[255] http://www.developpement-durable.gouv.fr/La-fiscalite-des-produits,11221

Excise Duty	Unit	Rate Applied in France	Existing ETD Minimum	EU-28 Average	EU-28 Median
3. Electricity: Including local and regional surtaxes – Q3-2013 according to IEA[256]					

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- **Energy**

  Transport fuels

  France's implicit tax rate for unleaded petrol, based on energy contents, is €18.97/GJ. It places petrol at a substantial disadvantage to diesel, for which the implicit energy tax rate - despite some adjustments in recent years - is €11.90/GJ or more than 35% lower than for petrol. France has one of the highest tax differentials (some other MS have similarly high differentials) between petrol and diesel in the European Union. The carbon element of the Taxe intérieure de consommation sur les produits énergétiques (TICPE) will narrow the gap by €0.12/GJ.

  The tax rate for unleaded petrol has been adjusted (in nominal terms) only minimally since 2004 and its value has been eroded by inflation as pointed out by Cour de Comptes. Other propellants (kerosene, LPG and natural gas) are being taxed at lower rates than petrol and diesel. Currently natural gas used as a transport fuel is exempt. Consequently, new vehicles based on LPG and natural gas is reported to have a market share of 3.5% in France in 2010 which is the second-highest rate of market penetration in EU MS.

  Heating fuels

  Gas and electricity have increased their market shares for domestic and commercial purposes in France over the past decades at the expense of mineral oils. Although electricity is readily available from nuclear suppliers in France, there are challenges with a peaking demand structure in the heating season.[257]

  Heating tax rates had not been adjusted for several years and so their values have been eroded by inflation. Gas, in particular, benefits from a relatively modest tax treatment.

- **Transport (excl. transport fuels):**
  - **Registration Taxes**
    - Car registration tax: A bonus/malus system applies to take account of vehicles' CO_2 emissions. It was intended that this should be revenue-neutral but in practice, it never has been, and has run at a deficit, despite adjustments to achieve revenue neutrality. To support the scheme there is a circulation tax of €160 for vehicles (<3.5t) emitting more than 190g CO_2 per km, due in the years following the year of registration.

[256] IEA (International Energy Agency) (2013) Energy prices and taxes Q4, Paris.

[257] IEA (International Energy Agency) (2010) Energy Policies of IEA countries: France 2009 review: France, Paris.

- There is a tax and surtax on registration certificates (Taxe sur les cartes grises) based on vehicle power with differentiated rates fixed at regional level[258].

- Circulation Taxes
  - An annual company car tax (Taxe sur les voiture de societé) is in place with the tax rate depending on emissions as measured in grams CO2 emitted per km. The rate payable per gram increases in bands, being low (€2-4) for the first 120g but then increasing up to €27 per gram for vehicles emitting 250 g or more per km. (e.g. 251g x €27 = €6,777/year).
  - There is an axle tax (Taxe a l'essieu) on heavy goods vehicles above 12 tonnes in weight. It was lowered 3 years ago to prepare for the introduction of the road user HGV (Heavy Goods Vehicles) tax (redevance poids lourds), which then in the end was not applied as prepared for. The reduction in the axle tax has remained despite the fact that the HGV tax was not introduced as planned by January 2014.
  - As well as the above, an an ad-valorem tax of 15% on insurance payments for vehicles is in place.
- Other
  - France has several levies relating to aviation including a civil aviation duty with tax rates of €4.31-€7.75 per passenger. A solidarity tax on flights is also in place. There are additional minor taxes and levies related to transport.[259]

➢ Pollution and resources:

- The following items are taxed under the French General Tax on Polluting Activities (TGAP; Taxe générale sur les activités polluantes);
  - Household and industrial waste: from €4 per tonne to €100 per tonne, depending on waste type, with standard rate for landfills at €30 per tonne, and for incineration at €14 per tonne.
  - Air pollution (NO_2, NO_x, VOCs, particulate matter, HCl): up to €260 per tonne of pollutant.
  - Waste oil: €44 per tonne.
  - Gravel: €0.20 per tonne.
  - Phosphate in washing powder.

[258] http://www.carte-grise.org/cout_carte_grise.htm

[259] Taxe d'aviation civile; Taxe d'aeroport; Contribution de solidarité sur les billets d'avion. No reporting is available on these taxes in TEDB of the European Commission. Taxe d'aviation civile and Contribution de solidarité are considered as environmental taxes by Eurostat (not Taxe d'aéroport which is a charge/redevance).

    - Classified installations posing environmental risk: up to €2,225 per business.
    - Plastic bags: €10 per kg (from 2014).
    - Certain micro-pollutants incl. mercury and arsenic (from 2014)
    - Annual revenue in 2011 from the taxes under the TGAP was €624 million according to the reporting to Eurostat (excl. €150 million fuel-related TGAP). The introduction of TGAP had been expected to create revenues of €2 billion annually and more in the longer run.
  - There is a noise tax in place for flights from airports (the TNSA, or *Taxe sur les nuisances sonores aériennes*).
  - Under the 1960 Loi sur l'eau, France has instituted an exceptional infrastructure based on regional Water Agencies financing water management. There is a complex set of levies imposed by these Agencies, principally for water abstraction and water pollution. Financially they raise about €2 billion annually. These revenues are ring-fenced for water management purposes.
- A number of environmentally harmful subsidies have been identified from work undertaken by IEEP and OECD, and from Excise Duty Tables (further detail is given in Section 11.2.2).[260,261,262] Examples of some of the main subsidies are as follows:
  - The preferential treatment accorded to company cars, implying a significant loss of tax revenue;
  - Exemptions from duties related to energy, including:
    - For diesel-based stationary engines (mainly in agriculture and construction);
    - Partial refunds for fuels used in road freight vehicles > 7.5 tonnes, and for fuel oil used in agriculture;
    - Exemptions from motor fuel duties for maritime navigation; and
    - Reduced excise taxes for LPG used as transport fuels.

11.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in France. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as a discussion of relevant EHSs. Outturns from the

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[260] See Table 3 in IEEP (2013) Steps to Greening Country Report: France, Report for the European Commission, pp.11-12.

[261] *OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp.167-176. dx.doi.org/10.1787/9789264187610-en*

[262] *DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

model regarding revenue projections are then presented, followed by a summary of the environmental benefits.

11.2.1 Current Status of EFR

The Ministry of Finance in France hosted a major international conference on Environmental Fiscal Reform during the French EU-Presidency in 2000 with more than 500 attendees from all over Europe. It focused on carbon taxation and other types of environment relevant taxes.

The TGAP was introduced in that period. The tax base was extended to several new items over the next five years. The caps on charges for water abstraction and water pollution at the same time were altered, resulting in an increase in ring-fenced revenues for water management under the six regional Water Agencies. An envisioned reform of TGAP was not, however, fully implemented and overall, relatively modest rates have been maintained for environment taxes.

Fuel protests following increases in oil prices around 2002-2003 triggered government announcements undermining the case for energy taxation, and with a long-term effect on motor fuel taxes in particular. The absence of indexation amounts to a loss of €1.3 billion in annual revenues for petrol, and €1.6 billion for diesel, relative to the case where the taxes had remained constant in real terms. Maintaining the petrol tax with inflation would have brought the rate up to €728/hl, or, to place this into context, the same level as Italy's present rate. The Cour also point out that the difference in rates between diesel and unleaded petrol represented a loss in tax revenue of €6.9 billion and that the reduced rate for domestic fuel represented a loss of €8.8 billion.

The former President, President Sarkozy, initiated legislation on carbon taxation with a law that was passed in 2009. However, a constitutional council disapproved the tax scheme, mainly due to concerns over exemptions for large emitters. A long and protracted process finally resulted in the integration within the TICPE of a component based on CO_2 for certain fuels in December 2013, with an initial rate of €7/tCO_2 and gradual phase-in over several years. The principle is to tax non-ETS emissions at a rate comparable to the ETS-price for carbon. The scheme is accompanied by programs to improve insulation and energy efficiency with government disbursements exceeding revenues from carbon taxation. The rates will increase in 2015 and 2016 (€14.5 / tonne CO_2 in 2015 and €22 / tonne CO_2 in 2016) (and is expected to generate an additional € 4 billion of revenue in 2016). The 2014 Finance Act also strengthened some other taxes through incorporating an air pollution component in the tax on company vehicles, and tightening the structure of the malus element of the existing registration tax. The TGAP also included new atmospheric pollutants. Some environmentally damaging subsidies were also removed or reduced.

Legislation has been prepared to implement the Eurovignette Directive by a HGV road-user charge in France, but protests curtailed the scheme in late 2013. Protests were pronounced in Brittany, a region with mainly state financed highways and a lack of road tolls.

In order to enhance competitiveness, there is a desire to lower the tax burden overall. The idea of shifting the tax burden is accorded only a limited role in this, despite France having a relatively low level of revenues from environmental taxes, and high social contributions, penalizing use of labor. Furthermore, France received, officially, has received a recommendation to this effect in European Semester:

> **Recommendation 5:** *Pursue efforts to simplify the tax system and improve its efficiency, while ensuring continuity of tax rules over time. Take measures to remove the debt bias in corporate taxation. Step up efforts to reduce and streamline personal and corporate income tax expenditures while reducing statutory rates; bring reduced VAT rates closer*

to the standard rate and remove inefficient reduced rates. Take further measures shifting the tax burden from labour to environmental taxation or consumption.

Previously OECD firmly recommended that France should 'increase rates of environmental taxes and charges'.[263]

11.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

Adjustments to existing taxes or new taxes:

- **Energy Taxes:**
  - Energy taxes are harmonised based upon energy content and CO_2. Transport motor fuels are equalised using the energy content on petrol (€17.1 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€0.57 per GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate of €0.15 per GJ and a CO_2-tax of €20 per tonne of CO_2. Note this implies a reduction in rates for gas oil and kerosene used as a heating fuel, however, for the purposes of this analysis the existing rates have been maintained. Electricity is presently taxed more heavily than other energy carriers, and adopting the suggested rates will go some of the way towards a more balanced treatment.
  - Table 43 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 43: Suggested Energy Tax Rates Compared with Existing Rates in France

	Units	Proposed Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	607	607
Light fuel oil (diesel)	€/1000 litre	655	428
LPG (propellant)	€/1000 kg	846	108
Kerosene	€/1000 litre	659	417
Natural gas (prop)	€/GJ	18	0

[263] OECD (2005) Environmental performance review: France, p. 19.

	Units	Proposed Rates	Existing Rates
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	72	72
Kerosene	€/1000 litre	71	25
LPG	€/1000 kg	84	47
Natural gas	€/GJ	2	0.33
BUSINESS HEATING			
Gas oil	€/1000 litre	57	57
Heavy fuel oil	€/1000 kg	68	19
Kerosene	€/1000 litre	57	57
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.33
Coal	€/GJ	2.04	0.33
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	57	57
Heavy fuel oil	€/1000 kg	68	19
Kerosene	€/1000 litre	57	57
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.00
Coal	€/GJ	2.04	0.00
ELECTRICITY			
Electricity - business use	€/MWh	25.23	17.03
Electricity - non-business use	€/MWh	25.23	25.23

- **Transport Taxes (excl. transport fuels):**
  - **Vehicles:** The taxes on transport in France are significantly lower than average in the EU (at 0.24% of GDP compared with the EU-28 level of 0.50% GDP). The French bonus-malus system has been effective in decarbonising the vehicle fleet, but has generated a deficit, possibly breaching EU state aid rules. With the present approach there is a risk that the rebound effect from a larger vehicle fleet

will offset emission reductions achieved, as one study from INSEE suggests.[264] Hence it is proposed that France should consider increasing vehicles taxes. In line with the Commission proposal of 2005, it is suggested that this could be done through a circulation tax targeting passenger vehicles (not just those used for business purposes). The existing circulation taxes for passenger vehicles either apply at a flat rate if the vehicle has emissions above a certain level, or apply only to company cars. Extending the circulation tax, and using banding in a similar vein to the approach used for company cars would have merit, whilst the approach could also take into account air pollution (such as particulate matter). Taxes on heavy goods vehicles would also appear to be still possible, although clearly, this has been the subject of considerable debate recently. On the basis of the benchmark for good practice in EU MS with regard to taxation on vehicles and transport fuels combined, there is scope to increase revenue generation associated with vehicles by around 1.09% of GDP. This implies that France has to move towards the higher rates of revenue generation expressed in terms of revenue generated per passenger vehicle from circulation taxes. The increase is phased in over the period from 2015 to 2020.

- **Aviation:** There is scope for increasing passenger flight taxation in-line with good practice. The revenues for the air passenger tax have been modelled on the basis of rates of €15 per passenger (flights within the country concerned), €25 per passenger (to other countries in the European Union), €50 per passenger (to other countries outside the European Union). It is expected, however, that rather than banding in this way, the tax would be set on the basis of journey distance. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➢ **Pollution and Resource Taxes:**

- **Aggregates:** There is in place a tax on aggregates in France but with a relatively small tax rate of €0.20 per tonne. Extraction of minerals for use as aggregates causes harm to the environment. An aggregates tax helps to reduce the environmental burden by increasing the price of raw materials, and so stimulates the market for recyclable materials. This ultimately reduces costs for businesses, but also is in-line with the flagship initiative 'A Resource Efficient Europe.[265] It is suggested that France implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this to keep the rate constant in real terms. The types of materials that could be covered by the tax are:
    - Marble;

[264] INSEE (2011). The environmental effect of green taxation: the case of the French "Bonus-Malus", Document de travail G2011/14, Paris.

[265] European Commission (2011) Roadmap to a Resource Efficient Europe, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

- Chalk and dolomite;
- Slate;
- Limestone and gypsum;
- Sand and gravel.

Not all of these are extracted in France. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste:** The TGAP standard rates for waste were reported in 2013 to be €30/tonne for landfill and €14/tonne for incineration with total revenues of about €250 million (2010).[266] The landfill tax will be increased to €40/tonne in 2015. The per capita amount of waste in France has increased with about 10% over the last decade, suggesting that high rates would be required to provide real incentives for recycling and resource efficiency. In line with the best practice identified it is suggested to increase tax rates to a minimum of €50 per tonne by 2017.
- **Packaging:** Packaging taxes are different from cost recovery fees required to discharge legal requirements in that they reflect environmental burdens rather than handling and processing costs. A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. France has a tax of €0.12 per kg of printed paper, but not for all packaging. It is suggested that the following rates could be applied to all packaging placed on the market in France:
  - Aluminium €197 per tonne
  - Plastic €64 per tonne
  - Steel €54 per tonne
  - Paper and card €20 per tonne
  - Glass €18 per tonne
  - Wood €13 per tonne

  These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.
- **Single-use carrier bag tax**: A tax on single-use plastic bags was introduced in France starting in 2014. Plastic bags cause many environmental problems when littered in the environment, especially when they end up in the marine environment. Taxing single-use plastic bags significantly influences consumers purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in

[266] C. Fischer et. al., 2012, Overview of landfill taxes in Europe, ETC/SCP working paper 1/2012, Copenhagen: European Topic Centre on SCP. Excluding local proxy taxes for littering and waste.

2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[267] The tax implemented by France has a rate of €10/kg. An average single-use plastic carrier bag weighs 8.5g which means that there are approximately 118 bags per kg.[268] This equates to €0.08 per bag which is close to the level of 'good practice', but it is suggested to increase the tax rate to €0.11 per bag and index with inflation in order to maintain the price signal and revenues.

- **Air pollution:** Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. The TGAP tax base for air pollution relates to NO_2, NOx, VOCs, particulate matter and HCl with highly differentiated tax rates up to €260 per tonne of pollutant (see Annex). It is suggested that in order to generate improvements in air quality the tax rates are adjusted. The proposed tax rates are considerably lower than the external costs of air pollution that have been estimated for France, but in view of available abatement options and their costs, rates are proposed as follows:
  - NOx/VOC €1,000 per tonne
  - SOx €1,000 per tonne
  - PM2.5 €2,000 per tonne

  Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2015 to maximum levels by 2018. The rates are then held constant in real terms.

- **Water abstraction:** France has a tax on water abstraction, with rates that differ regionally and also seasonally. The highest rate has been identified in the Seine-Normandie basin at €150 per 1,000 m^3 (for the purposes of the revenue estimates an average figure of €50 per 1,000 m^3 has been estimated to represented the existing level of taxation across the country). To improve efficiency in the usage of the water supply system it is suggested to adjust tax rates in-line with 'best practice'. With relative price levels in France this would imply rates of €300 per 1,000 m^3 for the public water supply, €180 per m^3 for manufacturing purposes and €25 per m^3 for agriculture. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.

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[267] DG Environment (2013) Proposal to Reduce Plastic Bag Consumption, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[268] BIO Intelligence Service (2011) *Assessment of Impacts of Options to Reduce the Use of Single-use Plastic Carrier Bags*, Report for DG Environment, European Commission, September 2011

- **Waste water:** France has a levy on water pollution that is administrated by the six Agences de l'eau (formerly, AFB), the Water Agencies, but under strict supervision of fiscal authorities. Currently, the Water Agencies can elect to set a rate as long as a specified ceiling is not reached. However, the ceilings are relatively low, and the rates voted by the Agencies are some way away from the ceiling. For one of the main water pollutants, BOD, the highest rate has been identified in the Seine-Normandie basin (at €0.7 per kg BOD). To improve prevention of water pollution and reflect better the environmental burdens it is suggested to adjust tax rates in-line with 'best practice'. With relative price levels in France this would imply a rate of €2.51 per kg BOD. For fresh-water discharges also phosphorus should be charged, while for coastal discharges a charge on nitrogen could be relevant. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2020 levels. Part of the revenues could accrue to national budget.
- **Pesticides:** Pesticides are taxed in France according to their diffuse pollution burden at rates from €0.9 to €5 per kg. Active ingredients in pesticides are harmful to the environment and taxing them helps reduce the volume of active ingredients in the products. It is suggested that France could increase its pesticides tax to a rate of €12.50 per kg active ingredient, reflecting 'best practice'. The suggested transition period is from 2016 to 2018, after which, it is suggested that this the rate is kept constant in real terms.
- **Fertilisers**: A tax on the use of non-organic nitrogen in fertilisers is suggested at a rate of 0.25 €/kg N from 2016. This tax rate would reflect relative price levels for France relevant to EU schemes under the CAP and support the prevention of groundwater contamination, ammonia evaporation, emissions of greenhouse gases and surface water eutrophication.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies are listed in Table 44, and are described further below.

Table 44: Some Environmentally Harmful Subsidies (France)

Subsidy	Amount involved (€ million, real 2013 terms)
ENERGY	
Diesel-based stationary engines are not subject to the regular excise tax on diesel fuel. The sectors most concerned by this measure are agriculture (40%) and construction (60%)	746 - 1,029
Partial refunds for diesel fuel used in road freight vehicles > 7.5 tonnes	376
Partial refunds of the excise tax on fuel oil used as a motor fuel in the agricultural sector, additional to reduced rate. Ad-hoc measure reinstated each year since 2004.	294
Excise duty exemption on fuels used for maritime navigation (including fishing) and domestic navigation	22
TRANSPORT (excl. transport fuels)	
Favorable treatment of company cars through the tax system	2,116 - 4,232
Financial support for new airports: Mayotte and Notre Dame des Landes	-
POLLUTION & RESOURCES	
Reduced water fees for farmers	-
Total	3,554 – 5,953

Sources:

See Table 3 in IEEP (2013) Steps to Greening Country Report: France, Report for the European Commission, pp.11-12.

OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp.167-176. dx.doi.org/10.1787/9789264187610-en

Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf

Official list of French taxes' spending relative to fossil fuels

Taxation papers, Bruxelles: European Commission DG TAXUD

In addition to the above, the following comments are made:

- **Energy:**
  - Price regulation of gas and electricity should reflect the actual costs rather than a legal obligation to keep prices low, as the latter may result in prices that are suboptimal.

- A reduced VAT rate at 5.5% for the small part of the electricity bill relating to the fixed costs represents an implicit subsidy and creates complexities in accounting and the billing of customers, so that using the standard rate might be considered.
- The social tariffs for electricity and gas have recently been extended so that about 4 million households benefit,[269] but are provided in a way not making it sufficiently relevant for the beneficiaries to consider efficiency in the use of these energy carriers. Consideration should be given to a scheme of 'green cheques' with a fixed compensation per person, not tied to energy consumption per se.

- **Transport (excl. transport fuels):**
  - **New vehicles based on LPG and natural gas** are reported to have a market share of 3.5% in France in 2010 which is the second-highest in EU MS.[270] Experience from Italy suggests that the result could be a significant loss in motor fuel revenues in due course. In France, each per cent conversion from conventional propellants will cost annually up to €230 million in forgone motor fuel revenues. Considering that the CO_2-emissions are, respectively, 7% (LPG) and 17% (CNG) less than for petrol per GJ, the current scheme gives a significant benefit to the alternative vehicles, even if ancillary clean air benefits in urban areas are worthy of a premium. It is suggested to phase out gradually the subsidies to a level that can be justified by the environmental burdens (external costs) related to CO_2 and air pollution in particular. Note that this preferable treatment would be addresses if taxes for transport fuels were harmonized as per the suggestions above.

- **Pollution and resources:**
  - The user charges for water supply and sewage appear from data in Eurostat's Household Budget Survey to be at a level that does not provide strong indications of full-cost recovery being avoided. Nevertheless it is suggested that good data on 'the full costs' need to be established according to Art 9 of WFD.
  - Ring-fencing of revenues from the water sector to the six regional Water Agencies has allowed for transfers between sectors. In particular agriculture seems to have benefited considerably from monetary transfers. In addition, some environmentally harmful projects have been funded. Ring-fencing of revenues might not always be beneficial to the environment. The proposed higher rates for water levies (see above) should not necessarily be ring-fenced, unless tied to environmental projects of undisputable benefit.

11.2.3 Summary of Revenue Outcomes

Table 45 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

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[269] http://www.developpement-durable.gouv.fr/Le-tarif-special-de-solidarite-TSS.html

[270] *ICCT (International Council on Clean Transportation) (2012)* European Vehicle Market Statistics, *2011 edition, Wash DC.*

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 45: Potential Additional Revenue from Environmental Fiscal Reform in France, million EUR (real 2013 terms)[271]

Type	2016	2020	2025
Energy			
Transport fuels	767	3,769	5,957
C&I / Heating	205	597	597
Electricity	1,992	1,992	1,992
Sub-total Energy, million EUR	2,965	6,359	8,547
Sub-total Energy, % GDP	0.14%	0.28%	0.34%
Transport (excl. transport fuels)			
Vehicle Taxes	4,688	25,077	27,283
Passenger Aviation Tax	1,566	3,321	3,645
Freight Aviation Tax	0.00	0.00	0.00
Sub-total Transport, million EUR	6,254	28,398	30,927
Sub-total Transport, % GDP	0.29%	1.23%	1.23%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	96	180	178
Landfill Tax - Inerts (C&D)	35	32	32
Incineration /MBT Tax	9	14	14
Air Pollution Tax	196	346	288
Water Abstraction Tax	728	1,602	1,527
Waste Water Tax	218	304	304
Pesticides Tax	199	326	271

[271] *% GDP calculated using the following source: Eurostat (2013)* GDP and Main Components - Current Prices *[nama_gdp_c], Accessed 29th November 2013,* *http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C*

Type	2016	2020	2025
Aggregates Tax	847	460	439
Packaging Tax	367	354	361
Single Use Bag Tax	184	47	52
Fertiliser Tax	0.254	0.464	0.440
Sub-total Pollution & Resource, million EUR	2,880	3,665	3,467
Sub-total Pollution & Resources, % GDP	0.13%	0.16%	0.14%
Total Environmental Taxes			
Total, million EUR	12,099	38,422	42,941
Total Increase, % GDP	0.56%	1.66%	1.71%
Total Environmental Harmful Subsidies			
Total, million EUR	4,754	4,754	4,754
Total Increase, % GDP	0.23%	0.22%	0.22%
Total Potential for Environmental Fiscal Reform			
Total, million EUR	**16,852**	**43,175**	**47,695**
Total Increase, % GDP	**0.79%**	**1.89%**	**1.93%**

11.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, EUR 643 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in SOx, NOx and PM10 emissions, reduced diesel and coal consumption and reduced reliance on landfills.

Table 46: Monetised Environmental Benefits from Implementation of Taxes, million EUR (real 2013 terms)

Tax Type	2016	2020	2025
Energy	37	105	128
Transport	76	209	213
Pollution & Resources	75	348	303
Total, million HRK	188	662	643
Total, % GDP	0.01%	0.03%	0.03%

11.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in France:[272]

- In 2012 environmental taxes generated revenue equivalent to 1.83% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **€12 billion** in 2016, rising to **€43 billion** in 2025 (both in real 2013 terms). This is equivalent to **0.56%** and **1.71%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be between **€3.6 billion** and **€6.0 billion** in 2016 (real 2013 terms), equivalent to **0.17%** to **0.29%** of GDP (the average of the two figures is used in Table 45 above).
- The largest single contribution comes from suggested changes in vehicle taxation. This accounts for **€27 billion** by 2025 (real 2013 terms), equivalent to **0.91%** of GDP. It was suggested that, in line with the Commission proposal of 2005, the increase in transport taxes could be done through a circulation tax targeting passenger vehicles (not just those used for business purposes).
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **€6 billion** of additional revenue in 2025 (real 2013 terms), equivalent to **0.2%** of GDP.
- The suggested increase in the tax on passenger flights could yield **€3.6 billion** by 2025 (real 2013 terms), equivalent to **0.12%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- The harmonisation of the tax on electricity used by businesses could generate an additional **€2 billion** by 2025 (real 2013 terms), equivalent to **0.07%** of GDP.
- It is estimated that by raising the tax on the abstraction of water and standardising it across France could generate **€1.5 billion** of additional revenue by 2025 (real 2013 terms), equivalent to **0.05%** of GDP.
- In addition, minor taxes on, *inter alia*, the extraction of aggregates, the discharge of waste water, and air pollution, could generate revenue of **€2.5 billion** by 2025 (real 2013 terms), equivalent to **0.08%** of GDP.

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[272] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **€0.7 billion** (real 2013 terms), or **0.03%** of GDP in 2025.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *Take further measures shifting the tax burden from labour to environmental taxation or consumption.*

  The above measures provide some suggestions regarding meeting this objective in respect of environmental taxation.

12.0 Hungary

12.1 Country Overview

12.1.1 Key Facts about the Economy and Tax System

- Hungary's economy grew significantly in the years leading up to 2007. GDP grew at an average annual rate of 4.2% in real terms between 2002 and 2006.[273] Growth slowed to almost zero before the recession hit, with real GDP increasing by only 0.1% in 2007. In 2008, GDP grew by 0.9% in real terms before falling sharply by 6.8% in 2009. Growth resumed in 2010 and 2011, with GDP increasing by 1.1% and 1.6%, respectively, in real terms. Further economic challenges were experienced in 2012, however, with GDP contracting by 1.7% in real terms.
- In 2012, total tax revenue was equivalent to 39% of GDP. Hungary relies heavily on indirect taxes, which provided 47% of its total tax take in 2012. Social security contributions contributed 34% of revenues, and direct taxes, only 20%. In the most recent years, there has been a significant shift from direct to indirect taxes. In the decade between 2000 and 2010, direct taxes provided 25% of the tax base on average, with indirect taxes providing around 41% of revenues.[274]
- In 2012, the revenues from environmental taxes amounted to 2.5% of GDP. Between 2001 and 2006, revenue from environmental taxes were, on average, 2.8% of GDP, with a peak occurring in 2004 when revenues were 2.9% of GDP.[275]
- The main revenue from environmental taxes comes from energy taxes. In 2012, revenue from energy taxes amounted to 1.95% of GDP. In the same year, revenues from taxes on transport (excl. transport fuels) were at 0.42% of GDP. Pollution and resource taxes accounted for 0.23% of GDP in 2012, having more than doubled since 2011.[276]

12.1.2 Relative Position within the EU

Figure 7 and Table 47 show Hungary's relative position compared to the EU-28 on a number of parameters in 2012:

- Figure 7 compares Hungary to the EU-28 level in respect of revenue derived from environmental taxes, as a share of GDP. Hungary's overall revenue from environmental taxes is above the European level of 2.29% of GDP. This is largely driven by the fact that

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[273] Eurostat (2014) *Real GDP Growth Rate – Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

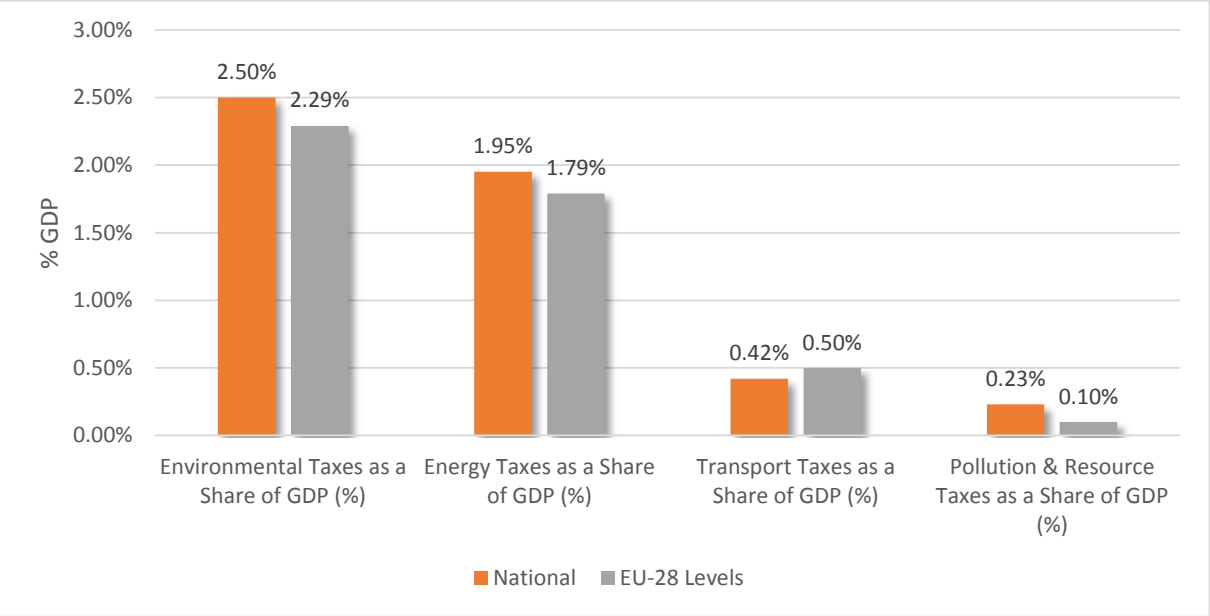
[274] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[275] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[276] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

revenues from energy taxes in Hungary are above the EU-28 level. Where revenue derived from transport (excl. transport fuels) is concerned, the level in Hungary is below the EU-28 level, whilst for pollution/resource taxes, Hungary's revenue, as a percentage of GDP, is well above the level for the EU-28.

Figure 7: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

- As a share of GDP, environmental tax revenue in Hungary ranked 14th in the EU-28 in 2012. Revenue from energy taxation ranked 12th. Taxes on transport (excl. transport fuels) ranked 15th, whilst revenue derived from taxes on pollution and resources ranked 7th (see Table 47).[277]

[277] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Table 47: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	14
Energy Taxes as a Share of GDP (%)	12
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	15
Pollution & Resource Taxes as a Share of GDP (%)	7

Source: based on Eurostat data

12.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax, as well as full references, are given in the Appendix (this Appendix also provides a detailed list of all of references for all of the sources of information in this section). This section summarises key aspects of the main environmental taxes, and describes, for energy, how the rates compare with European averages and the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[278,279]

- **Energy:** The Hungarian excise duties on fuels and electricity are shown in Table 24, alongside recommended minimum rates in the existing ETD and the EU-28 average and median rates.
    - For many fuels in Hungary, only one level of duty is set, regardless of the final usage of the fuel. This means that for fuels used in transport and other applications, the rates for those other applications are significantly above the EU-28 average. Hungary has taken advantage of the exemptions in the Directive and therefore has a number of different rates for some of the fuels. All such rates are explained fully in the Appendix. A few rates in Hungary are also below the EU-28 average, for example on electricity and some heating fuels liquid petroleum gas and natural gas.

[278] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[279] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Table 48: Standard Rates of Excise Duties on Fuels and Electricity in Hungary

Excise Duty	Unit	Rate Applied in Hungary[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol[2]	per 1,000 litres	HUF 124,200 (€419)	€421	€580	€583
Unleaded Petrol	per 1,000 litres	HUF 123,300 (€416)	€359	€536	€515
Gas Oil (Diesel)	per 1,000 litres	HUF 113,550 (€383)	€330	€425	€412
Kerosene	per 1,000 litres	HUF 124,200 (€419)	€330	€434	€410
Liquid Petroleum Gas	per 1,000 kg	HUF 95,800 (€323)	€125	€197	€176
Natural Gas	per GJ	HUF 0.00 (€0.00)	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)[3]	per 1,000 litres	HUF 0 - HUF 113,550 (€0 - €383)	€21	€233	€242
Kerosene	per 1,000 litres	HUF 124,200 (€419)	€21	€300	€330
Liquid Petroleum Gas	per 1,000 kg	HUF 12,095 (€41)	€41	€134	€125
Natural Gas	per GJ	HUF 88.50 (€0.30)	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	per 1,000 litres	HUF 113,550 (€383)	€21	€178	€122
Kerosene	per 1,000 litres	HUF 124,200 (€419)	€0.00	€265	€330
Heavy Fuel Oil[4]	per 1,000 kg	HUF 4,425 - HUF 116,000 (€15 - €391)	€15	€71	€25
Liquid Petroleum Gas	per 1,000 kg	HUF 0.00 (€0.00)	€0.00	€78	€42
Natural Gas	per GJ	HUF 88.50 (€0.30)	€0.15	€1.38	€0.59
Coal and Coke	per GJ	HUF 2,390 (€8.06)	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	per 1,000 litres	HUF 113,550 (€383)	€21	€185	€123
Kerosene	per 1,000 litres	HUF 124,200 (€419)	€0.00	€275	€330
Heavy Fuel Oil[4]	per 1,000 kg	HUF 4,425 - HUF 116,000 (€15 - €391)	€15	€75	€25
Liquid Petroleum Gas	per 1,000 kg	HUF 0.00 (€0.00)	€0.00	€110	€43
Natural Gas	per GJ	HUF 88.50 (€0.30)	€0.30	€2.11	€1.07

Excise Duty	Unit	Rate Applied in Hungary[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Coal and Coke	per GJ	HUF 2,390 (€8.06)	€0.30	€1.69	€0.32
Electricity					
Business Use	per MWh	HUF 295 (€1.00)	€0.50	€10.23	€1.21
Non-Business Use	per MWh	HUF 295 (€1.00)	€1.00	€14.68	€1.91

Notes:

1. The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013) ECU/ECR Exchange Rates versus National Currencies, *Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12.*

2. The use of unleaded petrol has been phased out in Hungary.

3. Reduced rates apply for agricultural, commercial and railway uses of gas oil. These sectors have lower minimum rates set out in the Energy Tax Directive. Rates for all sectors, apart from the railways, fall under the minimum taxation level set for that sector.

4. Lower rates apply for heavy fuel oil with low sulphur content.

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- Revenue in 2011: Electricity, natural gas and coal: HUF 17.3 billion (€62 million), equivalent to 0.06% of GDP. All other energy products: HUF 504 billion (€1.8 billion), equivalent to 1.8% of GDP.[280]
- Revenue in 2012: Electricity, natural gas and coal: HUF 16.2 billion (€57 million), equivalent to 0.06% of GDP.[281] Revenue figures for 2012 from other fuels were not available at the time of writing.
- In addition to the above excise duties, other energy-related taxes exist in Hungary, including a nuclear contribution tax, a tax on profits of energy companies (the so-called 'Robin Hood Tax') and a new tax on public utility infrastructure, including gas pipes and electricity lines. These are described further in the Appendix.

➢ **Transport (excl. transport fuels):**

- Hungary levies a one-off registration tax at the point when passenger cars or motorcycles are registered in Hungary. The rate depends on the engine size, environmental class, age of vehicle and time of registration. The minimum rate for

[280] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[281] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

a passenger car is HUF 45,000 (€152) and for a motorcycle HUF 20,000 (€68). Maximum rates for vehicles are €16,197 for the largest, most polluting vehicles, with the highest rate in the least polluting class (Euro V) being €1,350. (Electric vehicles pay no registration tax and hybrid-electric vehicles pay a flat rate of HUF 76,000 (€256). Revenue in 2012 amounted to HUF 13.7 billion (€48 million), equivalent to 0.05% of GDP.

- Hungary levies two separate taxes on the circulation of vehicles.
  - All vehicles pay an annual vehicle tax to the relevant local authority. Electric vehicles are exempt from this tax, as are some other vehicles, such as those used by the health services. For passenger cars, the tax rate is based on the engine power (in kW) and the age of the vehicle. Revenue from the circulation tax in 2012 was HUF 70.7 billion (€248 million), equivalent to 0.26% of GDP.[282]
  - In addition to the annual road tax above, there is the 'company car tax' which applies to all vehicles that are not used solely for personal use. The tax rate is based on the engine power (kW) and the environmental class of the vehicle. The rate for the company car tax is significantly higher than the road tax for all vehicles. Revenue in 2012 totalled HUF 34 billion (€120 million), equivalent to 0.12% of GDP.
- Hungary also operates a road toll system for passenger cars and heavy goods vehicles.
- In addition, there is a tax on third party liability insurance (an 'accident tax') and a tax on insurance companies, based on premiums paid. These are described further in the Appendix.

➢ **Pollution and resources:**

- A landfill tax was introduced in Hungary in 2013. The tax will be subject to annual increases until 2016.[283] Under the tax, non-hazardous municipal type wastes, construction and demolition waste, hazardous waste and sewage sludge are all charged at the same rate, whereas wastes from recovery operations which are still recoverable are charged at a rate 50% lower than the other waste types. In 2013 the landfill tax for most types of waste was HUF 3,000 (€10) per tonne, and will increase by HUF 3,000 (€10) per annum to a level of HUF 12,000 (€40) per tonne in 2016. Revenue figures are not yet available as the tax was only introduced in 2013.
- Hungary has an air pollution 'load charge' which taxes emissions of pollutants to air based on the amount of pollutant emitted. This covers emissions of nitrogen oxides, non-toxic dust, and sulphur dioxide. The applicable rates range from HUF 30 (€0.18) per kg to HUF 120 (€0.40) per kg (see the Appendix for further

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[282] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[283] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Hungary*, Report for European Commission - DG Environment, July 2013, page 16.

details). Revenues in 2010 were HUF 6.6 billion (€24 million), equivalent to 0.025% of GDP.

- Emissions to surface water are also charged for facilities which emit pollutants into the aquatic environment. This tax covers pollutants such as phosphorus, cadmium, mercury, and nitrogen. Rates range from HUF 90 (€0.30) per kg to HUF 220,000 (€740) per kg for different pollutants. Various correction factors are applied to these rates. Revenues in 2008 (the latest year for which data is available) were HUF 6.3 billion (€25 million), equivalent to 0.024% of GDP.
- Domestic sewage and other waste water emitted to soils is also charged at a rate proportional to the amount of waste water discharged. The rate is HUF 1,200 (€4.0) per m^3. Revenues in 2008 (the latest year for which data is available) were HUF 18 million (€71,400), equivalent to 0.0001% of GDP.
- An environmental product charge has been in place in Hungary since January 2012 and applies to products which are deemed to have a negative impact on the environment.[284] Items such as batteries, tyres, electric or electronic products, as well as packaging materials are charged at various rates per kg of material. Revenues from all environmental product charges in 2012 were HUF 55.0 billion (€190 million), equivalent to 0.020% of GDP.
- A water abstraction charge is also levied on use of water stocks. The Rate is HUF 4.5 (€0.02) per m^3 for users of water, with a higher rate of HUF 14.1 (€0.05) per m^3 for industrial consumers. Tax rate correction factors are also applied based on the source from which water is abstracted (e.g. groundwater vs. surface water) and the nature of use (e.g. irrigation). There is currently no data available on the revenues derived from this charge.
- Under Hungary's Mining Act, royalties are charged on the extraction of minerals, gas and oil. The rate of the royalty varies depending on the type of mineral being extracted and the method of extraction. For example, a 12% royalty is charged on the value derived from the extraction of mineral oil and natural gas. It should be noted that taxes on the extraction of oil or gas have now been removed from the definition of environmental taxes.[285] However, this tax has some relevance for subsequent discussions. The rate for non-metallic minerals extracted via open cast excavations (this includes sands and gravels) is set at 5% of the total value derived from these products.
- There are other minor environmental taxes in Hungary, such as a soil protection levy, a noise abatement levy and water fund tax.

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[284] The tax has undergone some recent amendments, see for example: RSM DTM Hungary (2014) Environmental Product Charge Changes, Published 1st January, Accessed 28th January 2014, www.rsmdtm.hu/environmental-product-charge-changes

[285] European Commission (2013) *Taxation Trends in the European Union: Data for the EU Member States, Iceland and Norway, 2013 Edition,* Luxembourg: Publications Office of the European Union.

- A number of environmentally harmful subsidies have been identified as part of work undertaken by IEEP and OECD, and from Excise Duty Tables.[286,287,288] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 12.2.2 (all subsidies are detailed in Appendix A.8.4). The main subsidies can be summarised as follows:
    - The preferential treatment accorded to company cars, implying a significant loss of tax revenue;
    - Subsidies to coal-mining, and petroleum and natural gas production;
    - Reduced excise duty rates for agriculture and railways.

12.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Hungary. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as the basis for how the calculation of revenue generation. Outturns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

12.2.1 Current Status of EFR

Fiscal consolidation and job creation remain key priorities for the Hungarian government.[289] Hungary belongs to the group of countries which have made rather moderate strides in respect of EFR.

On the other hand, labour taxes are relatively high compared to the countries in the EU-28. The current political agenda suggests that measures may be taken to change this situation, and actions are expected to be taken in the near future.

The Hungarian environmental tax rates are generally rather low so that the effect in terms of behaviour is rather weak. Equally, revenue generation is not especially high, but the income generation effect appears to dominate at present.

According to Sipos, the environmental consciousness of the Hungarian inhabitants is rather high compared to the European average.[290] Hungarians are, it would seem, willing to pay more for environmentally safe and sustainable products and services. Since most environmental tax rates are at low rates in Hungary, however, the potential of a real EFR remains to be exploited.

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[286] See Table 3 in IEEP (2013) Steps to Greening Country Report: Hungary, Report for the European Commission, pp.11-12.

[287] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, pp. 203 - 208, 2012, dx.doi.org/10.1787/9789264187610-en

[288] *DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

[289] Government of Hungary (2013) *National Reform Programme 2013 of Hungary*, April 2013, http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/

[290] Sipos, N. (2012): *A magyarországi zöld adóreform lehetőségei és korlátai. Doktori értekezés, Szent István Egyetem, Gödöllő [Possibilities and Limitations of the green tax reform in Hungary. Doctoral dissertation, University of St. Stephen, Godollo]*

Hungary's National Reform Programme for 2013 noted that the following environmental taxes had been adjusted as a means of generating additional revenue and shifting the country's tax base:

1. *"The tax content of diesel fuel prices was raised in order to reduce its tax advantage compared to gasoline"; and*
2. *"From 2012 the environmental fee on products was raised by three times on average".*[291]

The introduction of a landfill tax in 2013, with rates increasing to 2016, can also be expected to generate some additional revenue.

These changes, however, still leave considerable potential for changes in the spirit of EFR within the country. This, at least in part, led the European Council to issue the following country specific recommendation based on their review of Hungary's 2013 National Reform Programme:

> *"Ensure a stable, more balanced and predictable corporate tax system. Streamline corporate taxation and minimise distortions of resource allocation created by sector-specific taxes, so as to foster growth and employment. Continue making taxation of labour more employment-friendly by alleviating the tax burden on low-wage earners, inter alia by refining the eligibility criteria for the Job Protection Act, and by shifting taxation away to environmental taxes. Fully implement and step up the already announced measures to improve tax compliance and reduce the cost of tax compliance".*[292]

Despite the possibilities suggested above, the current political agenda is focused primarily on the economy and has not been so concerned with environmental possibilities/issues. This is despite the potential role that EFR could play in raising revenue to enable a reduction in labour taxes.

The section below outlines in more detail where some of this potential may lie by identifying a number of suggested changes to existing taxes or the introduction of new taxes. The suggested changes lead to estimates of the likely additional revenue and environmental benefits from the suggested reforms.

12.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

<u>Adjustments to existing taxes or new taxes:</u>

- **Energy Taxes:**
  - Energy taxes are harmonised based upon the highest energy content of all of the different fuels used for each purpose (propellants, heating etc). Transport fuels

[291] Government of Hungary (2013) *National Reform Programme 2013 of Hungary*, April 2013, http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/, p. 206

[292] Council of the European Union (2013) Recommendation for a Council Recommendation on Hungary's 2013 National Reform Programme and Delivering a Council Opinion on Hungary's Convergence Programme for 2012-2016, June 2013, http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/, p. 10

are equalised using the energy content on petrol (€11.3/GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the rate for kerosene, which is taxes at a relatively high rate at €10.4/GJ. For heating fuels kerosene is taxed at a high rate. Therefore, suggested rates for heating fuels are equalised based upon the rate for heavy fuel oil, which is still significantly above the rate applied to coal and natural gas (€8.2/GJ).

- Regarding transport fuels, the changes imply a rebalancing of taxation on diesel and petrol, and a significant increase in the rate for LPG. Regarding heating fuels, the major increases are experienced for gas and LPG.
- Table 49 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 49: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	415	415
Light fuel oil (diesel)	€/1000 litre	449	382
LPG (propellant)	€/1000 kg	577	323
Kerosene	€/1000 litre	451	418
Natural gas (prop)	€/GJ	12	0
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	416	382
Kerosene	€/1000 litre	418	418
LPG	€/1000 kg	534	41
Natural gas	€/GJ	11	0
BUSINESS HEATING			
Gas oil	€/1000 litre	382	382
Heavy fuel oil	€/1000 kg	391	391
Kerosene	€/1000 litre	418	418
LPG	€/1000 kg	436	0
Natural gas	€/GJ	9.34	0.30

	Units	Suggested Rates	Existing Rates
Coal	€/GJ	10.11	8.05
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	382	382
Heavy fuel oil	€/1000 kg	391	391
Kerosene	€/1000 litre	418	418
LPG	€/1000 kg	436	0
Natural gas	€/GJ	9.34	0.30
Coal	€/GJ	10.11	8.05
ELECTRICITY			
Electricity - business use	€/MWh	0.99	0.99
Electricity - non-business use	€/MWh	0.99	0.99

- **Transport Taxes (excl. transport fuels):**
  - **Vehicles:** The taxes on transport in Hungary are marginally lower than the EU-28 average (0.42% of GDP compared to the EU-28 level of 0.50% GDP). The increase in revenue from diesel taxation (see above) also implies an increase in taxes on transport fuels. One issue that Hungary faces is the potential for considerable fuel tourism, especially since neighbouring countries, such as Ukraine, are not part of the EU and have a different tax structure in respect of motor fuels.[293,294] In the absence of the ETD being formally agreed in its currently proposed form, there may be scope for use of mechanisms such as that used in Denmark, where circulation taxes on diesel vehicles are higher than those for petrol-driven vehicles in recognition of the issues that might be faced in increasing diesel tax rates. In any event, the potential for increasing circulation taxes on all vehicles clearly exists. These should be differentiated according to emissions of CO_2 and (as a means to address issues regarding particulate matter)

[293] European Commission (2007) Council Directive Amending Directive 2003/96/EC as Regards the Adjustment of Special Tax Arrangements for Gas Oil Used as Motor Fuel for Commercial Purposes and the Coordination of Taxation of Unleaded Petrol and Gas Oil Used as Motor Fuel, COM(2007) 52 Final, http://ec.europa.eu/prelex/detail_dossier_real.cfm?CL=en&DosID=195459

[294] Caboodle.hu (2011) *Hungary's New "Fuel Tourism"*, Published 21st November 2011, Accessed 29th January 2014, www.caboodle.hu/nc/news/news_archive/single_page/?tx_ttnews[tt_news]=9521

of other emissions, including particulate matter. The existing registration tax already captures much of this rationale, but its revenue take is rather small, whilst the existing circulation tax has no strong environmental rationale. Although the highest rates of circulation tax, estimated crudely on a 'per passenger car basis', are of the order €600 (Netherlands and Denmark), the existing circulation taxes in Hungary raise just over €200 per passenger car measured. It is suggested, therefore, that circulation taxes could generate an additional 0.4% of GDP, implying around a 75% increase in the revenue generated per passenger car. The increase is phased in over the period from 2015 to 2020.

- **Aviation:** Currently there is no aviation tax in Hungary. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Hungary, €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

- **Pollution and Resource Taxes:**
  - **Waste – landfill tax:** The level of landfill tax applied to non-hazardous waste in Hungary is set to rise to €40 per tonne in 2016 (in nominal terms) from its current level of €20 per tonne (2014). Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Additional increases in the tax may help give further impetus to the change in the waste management sector needed to meet EU targets in 2020 and give support to the application of the waste hierarchy. Therefore, it is suggested to increase the rate of landfill tax for non-hazardous wastes (except C&D wastes as the rate is already high) to €50 per tonne in 2017 and index rates thereafter so that the tax remains constant in real terms.
  - **Aggregates:** Under Hungary's Mining Act there is a 5% royalty charged on the value derived from non-metallic mineral raw materials obtained from open cast excavations. The new landfill tax may already be stimulating the search for alternative ways of using construction wastes. However, a suitably designed aggregates tax also helps reduce extraction rates for aggregates, and stimulates

demand for aggregates from secondary sources.[295] This approach is aligned with the Roadmap to A Resource Efficient Europe.[296] It is suggested that Hungary increases introduces an aggregates tax at the rate of €2.40 per tonne from 2016, and following this, keeps the rate constant in real terms (either through annual changes, or periodic increases). The exact nature of the existing royalty mechanism is unclear, but the tax could complement this, or lead to its replacement, at least for the materials being targeted). The types of materials that could be covered by the tax are:

  - Marble
  - Chalk and dolomite
  - Slate
  - Limestone and gypsum
  - Sand and gravel

  Not all of these are extracted in Hungary. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste – incineration / MBT tax:** In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne over the same period as the landfill tax is increased (i.e. up to 2017). An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.[297]
- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. There is currently a charge on packaging implemented in Hungary as part of the Environmental Product Charge. This generates 0.02% of revenue. No additional measures are proposed here.
- **Single-use carrier bag tax**: There is currently a tax on single-use plastic bags in Hungary at 1,800 Ft / kg (equivalent to approximately €0.05 per bag). A wide

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[295] European Environment Agency (2008) *Effectiveness of Environmental Taxes and Charges for Managing Sand, Gravel and Rock Extraction in Selected EU Countries*, June 2008, www.eea.europa.eu/publications/eea_report_2008_2

[296] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[297] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[298] It is suggested that Hungary increases the tax on single-use plastic bags to €0.06 per bag from 2015, and following this, keeps the rate constant in real terms.

- **Air pollution:** Hungary has a system of air pollution charges in place. According to Airbase (EEA), in 2011, 100% of the urban population in Hungary is exposed to PM_{10} concentrations exceeding the daily limit value (50 µg/m^3) for over 35 days per year.[299] The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. It is suggested that the planned rates could be increased further to generate additional incentives for abatement, and hence, improvements in air quality. The suggested tax rates are as follows:
    - SOx €1,000 per tonne
    - NOx €1,000 per tonne
    - PM_{10} €2,000 per tonne

  Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates are then held constant in real terms.

- **Water abstraction:** A central theme of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*. Hungary already has a water abstraction charge in place. It is suggested that the existing rates are increased so as to further improve efficiency in the usage of water. It is suggested that rates rise to levels of €80 per 1,000 m^3 for the public water supply and €50 per 1,000 m^3 for manufacturing purposes. The existing rate for 'users' if this covers the agricultural sector, is higher than the suggested rate of €7 per 1,000 m^3 already. Given the magnitude of the suggested increase in rates, a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. The rates should then be held constant in real terms.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the

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[298] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[299] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[300] Hungary's charge on discharge of BOD, for example, is at €0.01 per kg. To improve prevention of water pollution it is suggested to adjust tax rates in line with good practice. With relative price levels in Hungary, the suggested rate is €1.29 per kg BOD. For fresh-water discharges, it would be appropriate to consider revising rates for phosphorous (currently €5.06/kg). Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels. Part of the revenues could accrue to national budget.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  Hungary's National Pesticide Action Plan on pesticides was approved in November 2012. Although objective reduction targets have not been set, the Plan recognises the need to protect the environment and human health. The section on *'Use of Plant Protection Measures'* includes an indicator that will be used, along with others, to measure the success of the Plan. The indicator is: *"quantity of plant protection products sold"*.[301] There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Hungary. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would support progress towards the objectives set out in the National Pesticide Action Plan.

- **Fertilisers**: As Hungary does not currently apply a tax on the use of non-organic nitrogen fertiliser is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.20 per

[300] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

[301] Hungarian Ministry of Rural Development (2012) *National Plant Protection Action Plan*, November 2012, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm, p. 20

kilogram of nitrogen be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study, or previous studies, are listed in Table 32. Further details of our calculation methodology are available in Appendix A.8.4, in which we also present a full list of subsidies for which no figures for forgone revenues are available.

Table 50: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (HUF billion, real 2013 terms)
ENERGY	
Excise tax exemption for gas oil used in agriculture, horticulture, pisciculture and forestry	29[1] – 32.4[2]
Excise tax exemption for gas oil used for rail transport	
Excise tax exemption for household usage of electricity	3.2[2]
Levy paid by final electricity consumers for electricity generated from coal ("coal penny")	7[3]
TRANSPORT (excl. transport fuels)	
Favourable treatment of company cars through the tax system	197[4]
POLLUTION & RESOURCES	
Subsidies for coal-mining	112 – 169[3]
Subsidies for petroleum and natural gas production	90 – 124[3]
The household maintenance-cost subsidy – subsidy of residual consumption of heat	20[1]
Total	458 – 551

Notes:

1) *Amount involved stated in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, pp. 203 - 208, 2012, dx.doi.org/10.1787/9789264187610-en*
2) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*
3) *Amount involved stated in: Table 3 in IEEP (2013) Steps to Greening Country Report: Hungary, Report for the European Commission, pp.11-12.*
4) *Amount involved stated in: Table 3.6 in Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, p.28, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf*

12.2.3 Summary of Revenue Outcomes

Table 51 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities

or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 51: Potential Additional Revenue from Environmental Fiscal Reform in Hungary, million HUF (real 2013 terms)[302]

Type	2016	2020	2025
Energy			
Transport fuels	5,409	26,856	42,753
C&I / Heating	66,270	293,533	436,549
Electricity	0	0	0
Sub-total Energy, million HUF	71,679	320,388	479,302
Sub-total Energy, % GDP	0.23%	0.95%	1.28%
Transport (excl. transport fuels)			
Vehicle Taxes	24,754	132,353	146,846
Passenger Aviation Tax	42,940	90,028	98,167
Freight Aviation Tax	11.75	25.85	29.83
Sub-total Transport, million HUF	67,706	222,406	245,042
Sub-total Transport, % GDP	0.22%	0.66%	0.65%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	0	11,383	11,449
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	2,763	6,411	6,706
Air Pollution Tax	4,078	7,035	5,985
Water Abstraction Tax	2,253	4,427	3,828

[302] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Waste Water Tax	6,644	9,279	9,279
Pesticides Tax	21,598	45,611	51,328
Aggregates Tax	33,163	18,540	16,973
Packaging Tax	0	0	0
Single Use Bag Tax	3,204	996	1,100
Fertiliser Tax	9.248	18.040	18.643
Sub-total Pollution & Resource, million HUF	73,713	103,700	106,667
Sub-total Pollution & Resources, % GDP	0.24%	0.31%	0.28%
Total Environmental Taxes			
Total, million HUF	213,098	646,494	831,012
Total Increase, % GDP	0.68%	1.91%	2.21%
Total Environmental Harmful Subsidies			
Total, million HUF	504,788	504,788	504,788
Total Increase, % GDP	1.69%	1.65%	1.62%
Total Potential for Environmental Fiscal Reform			
Total, million HUF	**717,886**	**1,151,282**	**1,335,799**
Total Increase, % GDP	**2.37%**	**3.56%**	**3.83%**

12.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, HUF 35 billion of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in the consumption of natural gas, reduced SOx, NOx and PM10 emissions from stationary sources and reduced reliance on landfills.

Table 52: Monetised Environmental Benefits from Implementation of Taxes, million HUF (real 2013 terms)

Tax Type	2016	2020	2025
Energy	2,975	12,355	17,652
Transport	1151	3062	3118
Pollution & Resources	2,444	15,509	14,405
Total, million HUF	6,570	30,925	35,175
Total, % GDP	0.02%	0.10%	0.11%

12.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Hungary:[303]

- In 2012 environmental taxes generated revenue equivalent to 2.5% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **HUF 213 billion (€0.7 billion)** in 2016, rising to **HUF 831 billion (€2.8 billion)** in 2025 (both in real 2013 terms). This is equivalent to **0.68%** and **2.2%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be between **HUF 458 billion (€1.5 billion)** and **HUF 551 billion (€1.8 billion)** in 2016 (real 2013 terms), equivalent to between **1.5%** and **1.8%** of GDP (the average of the two figures is reported in Table 51 above).
- The largest single contribution comes from the suggested changes to the taxes applied to fuels used by businesses for heating purposes. This accounts for **HUF 437 billion (€1.5 billion)** by 2025 (real 2013 terms), equivalent to **0.89%** of GDP.
- Increases in vehicles taxes accounts for **HUF 147 billion (€0.49 billion)** by 2025 (real 2013 terms), equivalent to **0.3%** of GDP.
- The suggested introduction of a tax on passenger flights could yield **HUF 98 billion (€0.33 billion)** by 2025 (real 2013 terms), equivalent to **0.2%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is

[303] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.

- The introduction of a tax on pesticides in Hungary could yield an additional **HUF 51 billion (€0.17 billion)** by 2025 (real 2013 terms), equivalent to **0.1%** of GDP.
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **HUF 43 billion (€0.14 billion)** of additional revenue in 2025 (real 2013 terms), equivalent to **0.09%** of GDP.
- In addition, minor taxes on, *inter alia*, the discharge of waste water, the disposal of non-hazardous waste in landfill, water abstraction, and air pollution, could generate revenue of **HUF 55 billion (€0.18 billion)** by 2025 (real 2013 terms), equivalent to **0.11%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **HUF 35 billion (€0.12 billion)** by 2025 (real 2013 terms), or **0.11%** of GDP.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *Continue making taxation of labour more employment-friendly by…inter alia…shifting taxation away to environmental taxes.*

The above suggestions are made with a view to helping to align taxation with the above recommendation in respect of environmental taxes.

13.0 Italy

13.1 Country Overview

13.1.1 Key Facts about the Economy and Tax System

- The high economic growth rates seen in Italy during the post-WWII decades came to an end at the turn of the century; during the most recent decade there has been limited growth in annual GDP, generally attributed to an absence of productivity improvements.[304] Between 2004 and 2007, real GDP increased at an average rate of 1.6% per annum, i.e. just over half the euro-area average (3.3%).[305]
- Italy was seriously affected by the financial crisis, experiencing a 5.5% drop in real GDP between 2008 and 2009. Economic growth subsequently resumed, though in 2012, the last year for which data is available, the economy contracted once again, with GDP falling by 2.5% in real terms.[306]
- Italy's overall tax revenue (including social contributions) is high compared to most member states, at 44.0% of GDP in 2012. . This ratio has been increasing over the last decade, averaging 40.6% between 2001 and 2006, and 42.5% between 2006 and 2011.[307]
- Income from taxes is split fairly evenly between direct taxes (34.7% in 2012), indirect taxes (33.9%) and social contributions (31.5%).[308]
- The proportion of GDP accounted for by revenue from environmentally-related taxes fell over the last two decades from a high of 3.0% in 2001 and 2003, to 2.5% in 2008. The figure increased, however, to 3.02% in 2012, the latest year for which data is available.[309]
- There are several environmentally-related taxes in place in Italy within energy and transport, and such taxes have been recently revised and extended. The largest proportion of environmentally-related taxation in 2012, the latest year for which data is available, was realised through energy taxes, with a 2.34% energy tax revenue to GDP

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[304] Council of the European Union (2011) Council Recommendation of 12 July 2011 on the National Reform Programme 2011 of Italy and Delivery and Council Opinion on the Updated Stability Programme of Italy, 2011-2014, July 2011, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:215:0004:0007:EN:PDF

[305] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[306] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[307] Eurostat (2013) Main National Accounts Tax Aggregates [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[308] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[309] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

ratio. Taxes on transport (excl. transport fuels) also accounted for a significant proportion of revenue, at 0.65% of GDP. Italy has introduced taxes on air pollution and waste, partly at regional level, but taxes on pollution and resources accounted for just 0.03% of GDP in 2012.[310]

- The proportion of total environmental tax revenue realised from energy fell from 79% in 2003 to 75% in 2011, although the proportion has increased in 2012 to 78%. Revenue from pollution and resources taxes also proportionately decreased over this period, while transport tax revenue have accounted for a steadily increasing proportion of total environmental tax revenue over time, growing from 19% in 2001 to 22% in 2012.[311]

13.1.2 Relative Position within the EU

- In 2012, expressed as a proportion of GDP, environmental tax revenue in Italy was above the level for the EU-28. By the same measure, revenue generated from energy taxes and transport taxes (excl. transport fuels) was also above the EU-28 level, though the revenue from pollution and resource taxes was well below the EU-28 level (Figure 8).
- In 2012, Italy ranked 6th in the EU-28 in terms of the ratio of environmental taxes to GDP.[312] Measured as a percentage of GDP, revenue from energy taxes in Italy ranked 4th within the EU-28. The ranking was 11th where revenue from transport taxes (excl. transport fuels) was concerned, but much lower (19th) in respect of taxes on pollution and resources.[313]

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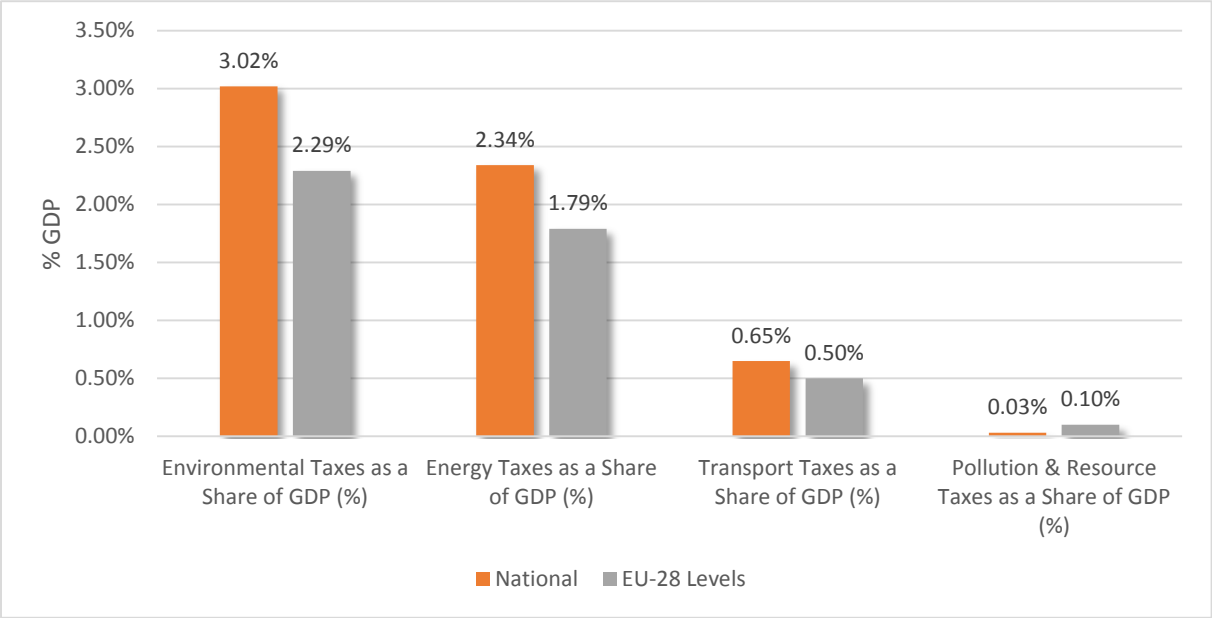
[310] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[311] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[312] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

[313] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Figure 8: Environmental Taxes as a % of GDP vs EU-28 Levels (2012)



Source: Eurostat data

Table 53: Ranking of Italy in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	6
Energy Taxes as a Share of GDP (%)	4
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	11
Pollution & Resource Taxes as a Share of GDP (%)	19

Source: based on Eurostat data

13.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax, as well as full references, are given in the Appendix. This section summarises key aspects of the main environmental taxes, and for energy, describes how the rates compare with European averages and with the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual

averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[314,315]

Energy: The Italian excise duties on fuels and electricity are shown in Table 54, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

Table 54: Standard Rates of Excise Duties on Fuels and Electricity in Italy

Excise Duty	Unit	Rate Applied in Italy	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	€728.40	€421	€580	€583
Unleaded Petrol	€ per 1000 litres	€728.40	€359	€536	€515
Gas Oil (Diesel)	€ per 1000 litres	€617.40	€330	€425	€412
Kerosene	€ per 1000 litres	€337.49	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	€267.77	€125	€197	€176
Natural Gas	€ per GJ	€0.09	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€185.22	€21	€233	€242
Kerosene	€ per 1000 litres	€101.25	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	€80.33	€41	€134	€125
Natural Gas	€ per GJ	€0.32	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€403.21	€21	€178	€122
Kerosene	€ per 1000 litres	€337.49	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	€63.75	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	€18.99	€0.00	€78	€42
Natural Gas	€ per GJ	€0.34	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€0.16	€0.15	€1.23	€0.31

[314] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[315] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Italy	Existing ETD Minimum	EU-28 Average	EU-28 Median
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€403.21	€21	€185	€123
Kerosene	€ per 1000 litres	€337.49	€0.00	€275	€330
Heavy Fuel Oil	€ per 1000 kg	€128.27	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	€189.94	€0.00	€110	€43
Natural Gas	€ per GJ	€1.19 - €5.03[1]	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€0.32	€0.30	€1.69	€0.32
Electricity					
Business Use	€ per MWh	€12.50	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	€22.70	€1.00	€14.68	€1.91
Notes: 1. Exact rate dependent on the annual consumption of natural gas					

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- **Energy Taxes:**
- *Motor fuels*
  - Italy's tax for unleaded petrol at €728/hl remains well below its historical peak in 1990, where it amounted to €538/hl in nominal terms – comparable to €1040/hl in present-day prices. After a long period during which the petrol tax was hollowed out by inflation, since 2010, the tax rate has been increased by 18%, or around double the rate of inflation. The implicit tax rate for unleaded petrol according to energy contents is €22.76/GJ, which, despite some narrowing of the gap to the tax rate for diesel, still places petrol at a considerable disadvantage. The implicit energy tax rate for diesel is €17.15/GJ.
  - Other propellants (kerosene, LPG and natural gas) are being taxed at lower rates than petrol and diesel. Italy's pioneering program for CNG gas-vehicles explains why the current ETD minimum rate is not applied for gas propellants. Considering that, in Italy, there are now close to 800,000 such vehicles in operation, supported by an extensive network of filling stations (see: http://www.ngvaeurope.eu/italy), the tax advantage has implications. The same can be said for the more traditional LPG-vehicles that number one million, while benefitting from a modest fuel tax (€5.82/GJ). It is worth noting that the CO_2 emissions per GJ are only 7% (LPG) and 17% (CNG) less, respectively, than those from petrol.

- Diesel for agricultural machinery is taxed at 22% of the current standard rate, whereas petrol is taxed at 50% of the standard rate. Since agricultural machinery today is fuelled by diesel, there is limited basis for continuing a reduced rate for petrol, and Italy appears to the only Member State to do so.

➢ *Heating*

- Gas has increased its market share for domestic and commercial purposes in Italy over the past 15 years, while continuing to benefit from a relatively modest tax rate. For households, the rate is only half the level applied to mineral oils. Italy's heating tax rates have not yet been adjusted and so have been hollowed out by inflation (by around 10% since 2008).
- While mineral oil and kerosene used for business and non-business heating are taxed at rates of €10-11/GJ, the implicit tax rate for natural gas is only €0.3/GJ and €5/GJ for the different uses, respectively. There is a basic allowance of 120 m^3 gas, which for households, is taxed at €1.2/GJ. LPG and heavy fuel oils enjoy comparable advantages with rates of about €0.75/GJ, while coal, despite its high carbon content, is taxed at the lowest rate of all (€0.16/GJ).
- The electricity tax consists of a national tax, a regional tax and a municipal surtax. The municipal surtax partially exempts households for 150 kWh per month or 1,800 kWh/year.[316] It is set at a rate of €18.6/MWh (€5.2/GJ). The municipal surtax does not apply to business or public services.

➢ **Transport (excl. transport fuels)**

- A registration tax (IPT: Imposta provincial di trascrizione) is applied to both new and second-hand cars and is based on engine capacity (kW). For passenger cars, the national fixed rate of €150 can be increased by up to 30% depending on the region and province.
- The circulation tax for passenger cars is based on the engine capacity and EURO emission standards. However, for coaches and buses, the circulation tax is based only on engine capacity, while for commercial vehicles on weight (incl. axles and shock absorption). The annual circulation tax rate for passenger cars is differentiated among Regions. It varies from €2.58 to €4.95 per KW according to data reported to OECD/EEA database. Several reductions apply. A surtax was added for high-powered vehicles with the recent 'Salva Italia' decree. Also boats and private aircraft are liable to the surtax.
- The vehicle taxes do not differentiate according to CO_2 emissions, but for vehicles below 120g CO_2 per km there is a reduction in the applied rate. Also, gas and LPG-powered vehicles are favoured.
- A distance-based road toll is charged for specific parts of the road network.
- There is a driving license tax and a regional tax on motor vehicle insurance.

[316] European Commission, DG TAXUD (2013) Taxes in Europe database, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=347/1357119833&taxType=Other+indirect+tax

- Italy has legislation in place for a local noise tax related to airports, which, however, is not being applied by any Region.
- In terms of the overall balance for the transport-related taxes, the circulation tax is the most significant with annual revenues close to 0.5 per cent of GDP or five times the registration tax. 90% of circulation tax and 50% of registration tax revenues remain with the Regions. A reform of vehicle taxation is complicated by these institutional arrangements, whereby the national government may take less interest in the tax base modalities and its fiscal and environmental implications.

➢ **Pollution and resources:**

- Italy has (since 1933) a water consumption tax (*Imposta sul consumo d'acqua*) which is a pure tax accruing in principle to the state, but administered by the Regions as surtax on water tariffs. Extended since 1994 to groundwater, it is now listed on Eurostat's National Tax List, but according to Italy's reporting, there have never been revenues accruing. Still, it is understood that it applies to all sectors in the economy, including households, business, agriculture and hydropower. With rates having been eroded by inflation it is felt at most only by hydropower. One senior water sector expert estimates annual revenues at €300 million, while emphasising the uncertainties.[317] For water consumers it implies a burden hardly exceeding 1 cent per m^3. Revenues are apparently 'sunk' in the accounting system and cannot be identified by ISTAT as environmental tax revenues, hence unreported to Eurostat.
- The national rates of the air pollution tax (*Tassa emissioni anidride solforosa ed ossido di azoto*) for stationary emitters are €0.106/kg SO_2 and €0.209/kg NOx. They were increased in response an OECD environmental performance review 10 years ago, but since then have been eroded by inflation.[318] As a result they have fallen back close to the original level, in real terms.[319]
- The landfill tax in Italy (*Tributo speciale discarica*) is applied at the regional level and by all regions. Currently the maximum rate is €25/tonne for municipal solid waste, but the average tax rate imposed by Regions was €15/tonne.[320] Tax rates did not increase in the period from 2008-2012.
- There is an 'urban waste' associated surtax for local environmental protection (*Tributo funzione tutela e protezione ambiente*) which is a regional component with the same tax base as the so-called 'municipal waste tax' (*Tributo comunale sui rifiuti e sui servizi*). The latter is a recently reformed fiscal instrument with a charge base related to 'premises or open areas' vaguely associated with littering from

[317] Prof. A. Massarutto, Dept. of Economics, University of Udine.

[318] OECD (2002) Environmental Performance Review: Italy, Paris, p. 138.

[319] IEA (International Energy Agency) 1999, Energy policies of IEA countries: Italy, Paris, p. 51.

[320] C. Fischer et. al. (2012) Overview of landfill taxes in Europe, ETC/SCP working paper 1/2012, Copenhagen: European Topic Centre on SCP. http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1

these. The rate applying is €0.3 per m^2 and it contributes towards the costs of local waste management services. Revenues from the regional surtax (€250 million) are identified in National Tax List by Eurostat as an environmental tax.[321]

- An ad-valorem pesticides tax was introduced in 2000 (Law 488/99)[322]. The tax rate has been set at 2 per cent but according to data reported by Italy to OECD/EEA database with revenues (2008) annually at only €12 million. These are ring-fenced for a 'Fund for the development of organic farming and quality products' and are not included on Eurostat's National Tax List.

➢ A number of environmentally harmful subsidies have been identified from work undertaken by IEEP and OECD, and from Excise Duty Tables (further detail is given in Section 13.2.2).[323,324,325] Examples of some of the main subsidies are as follows:

- The preferential treatment accorded to company cars, implying a significant loss of tax revenue;
- Reduced rates for gas oil used in agriculture, horticulture, forestry, and aquaculture;
- Fuel tax exemptions for the transportation of goods and passengers along national waterways and within EU waters.

13.2 Illustrative Potential of EFR

13.2.1 Current Status of EFR

In 1990 Italy had one of the highest shares of environment-related taxes, higher than the Nordic countries, due in particular to motor fuels taxation, as supported by its peninsular geography. Following an innovative period in the 1990's (which saw the introduction of taxes on, for example, air pollution, groundwater, waste, plastic bags and pesticides) revenues declined steadily, falling by around 30% relative to GDP over the past 15 years. This was mainly as a result of the absence of rate adjustments in line with inflation (only few taxes were abolished[326] or had their rates reduced in nominal terms). Meanwhile Italy acquired a leading position in EU with regard to taxes on labour.

Italy's 'style' for indirect tax administration is marked by numerous and not always transparent exemptions and reductions (see EHS tables above), leaving, perhaps, too much scope for negotiations over the exact rates to be applied between inspectors and the taxable. There

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[321] A municipal tax for advertising (*Imposte comunali sulla pubblicità e sulle affissioni*) applies to advertising by visual or acoustic means, with a tax base per square meter. Tax rates are fixed by municipal authorities for whom it generates more than €400 million in annual revenues but is not according to Eurostat an environmental tax.

[322] OECD (2002) Environmental performance reviews: Italy, Paris.

[323] See Table 5 in IEEP (2013) Steps to Greening Country Report: Italy, Report for the European Commission, pp.15-16

[324] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 225-230, dx.doi.org/10.1787/9789264187610-en

[325] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity),* Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[326] A plastic bag tax with a rate of 1 cent per bag.

appears also to be a certain competition between local, regional and national entities over the same tax bases, without clear division of liabilities, and there might be a risk that public legitimacy can be jeopardized by overdoing this approach.

In late 2011, in response to the worsening of Italy's position on the financial markets, the government approved a budget package named 'Salva Italia'. It included certain measures in respect of environmental-related taxes, including adjustment of excise taxes on motor fuels and the new tax on high-powered vehicles and boats. It also revised the tax on 'urban waste' administered by municipalities. Furthermore it assigned responsibility for financial oversight of the water sector to the energy regulator, AEEG, as a prerequisite for water pricing measures. In the same year The Ministry of Finance hosted a major conference on Environmental Fiscal Reform, supported by EEA, to review the options for Italy.[327]

In the following year, excise duties on motor fuels were further increased, in particular with regard to the rate for diesel, whereby the differential to petrol has been narrowed considerably. The government also proposed a carbon tax which should come into effect with the amended ETD, and considered use of auctioning of allowances under the EU-ETS as a means to generate additional revenue for the budget. It also removed some incentives in place for company cars.

In 2013 the government opted for a fiscal delegation (Delega Fiscale) whereby the government would be mandated by parliament to review and improve the budget by adapting various taxes and charges during a 6-9 month period. This bill includes a clause on Green Tax Reform and has been approved by the Senate. In the same year, in the European Semester process, a country specific recommendation was made for Italy which clearly indicated the desirability of EFR:

> **Recommendation 5:** *Shift the tax burden from labour and capital to consumption, property and the environment in a budgetary neutral manner. To this purpose, review the scope of VAT exemptions and reduced rates and of direct tax expenditures, and reform the cadastral system to align the tax base of recurrent immovable property to market values. Pursue the fight against tax evasion, improve tax compliance and take decisive steps against the shadow economy and undeclared work.*

The above synopsis suggests that options for shifting the tax burden in the spirit of EFR are receiving serious attention.

13.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

Adjustments to existing taxes or new taxes:

- **Energy Taxes:**

[327] EEA (European Environment Agency) (2011) Environmental fiscal reform – illustrative potential in Italy, Staff Position Note, Copenhagen: EEA. http://www.dt.tesoro.it/export/sites/sitodt/modules/documenti_it/eventi/eventi/EEA_Briefing_Note_for_ETR_Workshop_Rome_finaldraft.pdf

- Energy taxes are harmonised based upon the highest energy content of all of the different fuels used for each purpose (propellants, heating etc). Transport fuels are equalised using the energy content on petrol (€20.8 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€3.80 per GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate for natural gas of €1.99 per GJ. Note this implies a reduction in rates for gas oil and kerosene used as a heating fuel, however, for the purposes of this analysis the existing rates are maintained.
- Table 55 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.

Table 55: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Proposed Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	728	728
Light fuel oil (diesel)	€/1000 litre	785	617
LPG (propellant)	€/1000 kg	1016	268
Kerosene	€/1000 litre	790	337
Natural gas (prop)	€/GJ	22	0.09
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	185	185
Kerosene	€/1000 litre	186	101
LPG	€/1000 kg	233	80
Natural gas	€/GJ	5	0.32
BUSINESS HEATING			
Gas oil	€/1000 litre	403	403
Heavy fuel oil	€/1000 kg	141	64
Kerosene	€/1000 litre	337	337
LPG	€/1000 kg	150	19
Natural gas	€/GJ	3.11	0.34
Coal	€/GJ	3.88	0.16

	Units	Proposed Rates	Existing Rates
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	403	403
Heavy fuel oil	€/1000 kg	141	128
Kerosene	€/1000 litre	337	337
LPG	€/1000 kg	190	190
Natural gas (average rate)	€/GJ	3.11	3.11
Coal	€/GJ	3.88	0.32
ELECTRICITY[328]			
Electricity - business use	€/MWh	22.70	12.50
Electricity - non-business use	€/MWh	22.70	22.70

- **Transport Taxes (excl. transport fuels):**
  - **Vehicles:** The taxes on transport in Italy are higher than average in the EU (0.65% of GDP). In addition, due to relatively high taxes on transport fuels and an increase in revenue from diesel, the combined package of taxes on transport fuels and vehicles appears relatively comprehensive. Even so, the overall revenue take from transport and from motor fuels would remain some way below the upper levels in the EU-28. As such, there remains scope for increasing the revenues from transport (including revenues from transport fuels) over and above those described above for transport fuels. The vehicle taxes currently in place do not adequately target emissions. This could be achieved through adjusting circulation taxes to incorporate banding of tax rates in line with emissions, and ensuring that vehicles other than passenger vehicles are also included in such banding. The emissions performance might retain the attention to emissions other than GHGs given the issues being faced in respect of low level ozone (see below). Italy should consider also implementing the Eurovignette Directive. On basis of the benchmark for good practice in EU MS with regard to vehicles and motor fuels there should be scope to increase the tax burden on vehicles by 0.2% of GDP. The increase is phased in over the period from 2015 to 2020.

[328] IEA (International Energy Agency) (2013) Energy prices and taxes 2013, Paris indicates for households €57.5/MWh and for industry €91.7/MWh (excl. VAT) as of Q3/2013. These rates appear to include municipal surtaxes applying only in the 5 autonomous Regions of Italy.

- **Aviation:** Currently there is no aviation tax in Italy. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. It is therefore suggested that an aviation tax on air passenger flights and on air freight be introduced. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax the suggested rates for the air passenger tax for are €15 per passenger (flights within the country concerned), €25 per passenger (to other countries in the European Union), €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➢ **Pollution and Resource Taxes:**

- **Aggregates:** There is currently no tax on aggregates in Italy. Extraction of minerals for use as aggregates causes harm to the environment. An aggregates tax helps reduce the environmental impact by reducing demand for raw materials, and stimulates the market for using materials from secondary sources, such as construction wastes. This ultimately reduces costs for businesses, but also is in-line with the flagship initiative 'A Resource Efficient Europe.[329] It is suggested that Italy implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this to keep the rate constant in real terms. The types of materials that could be covered by the tax are:
  - Marble;
  - Chalk and dolomite;
  - Slate;
  - Limestone and gypsum;
  - Sand and gravel.
- **Waste taxation:** Landfilled waste has declined by 20-25% since introduction of the landfill tax (Tributo speciale discarica), but the per capita amount of waste in Italy has increased by around 20% over the last decade, suggesting that higher rates would be required to provide real incentives for recycling and resource efficiency. Currently the maximum rate is €25/ton for municipal solid waste, whilst the average tax rate imposed by Regions was €15/tonne.[330] Tax rates did not increase in the period from 2008-2012. There are marked disparities in performance in waste management across the Italian regions. Indeed, whilst Italy has some of the best performing municipal waste management systems in the

[329] European Commission (2011) Roadmap to a Resource Efficient Europe, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[330] C. Fischer et. al. (2012) Overview of landfill taxes in Europe, ETC/SCP working paper 1/2012, Copenhagen: European Topic Centre on SCP. http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1

EU, it also has some of the worst. It is suggested that the tax rate for landfilling should be gradually increased to a minimum level of €50 per tonne by 2017. There is no incineration tax and to ensure that recycling has priority it is suggested that the waste tax also applies to incineration. A tax on incineration and MBT is suggested for introduction at a level of €15 per tonne, also by 2017.

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied to all packaging placed on the market in Italy:
    - Aluminium €197 per tonne
    - Plastic €64 per tonne
    - Steel €54 per tonne
    - Paper and card €20 per tonne
    - Glass €18 per tonne
    - Wood €13 per tonne

  These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax**: There is a ban on single use plastic bags in Italy, so no tax is suggested.

- **Air pollution:** Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. Italy has a system of air pollution taxes in place with rates in 2013 of €106/tonne SO_2 and €209/tonne NOx. These rates are modest compared with best practice and have not been adjusted for the past 10 years.[331] In relation to low-level ozone being an issue in Italy, NOx and VOC are the main issues, and Italy needs to reduce these by 28% respectively 21% to meet the 2020 emission ceiling. [332] It is suggested that adjustments in tax rates are implemented in order to generate improvements in air quality as follows:
    - NOx and VOCs €1,000 per tonne
    - PM2.5 €2,000 per tonne
    - SOx €1,000 per tonne

[331] OECD (2002) Environmental Performance Review: Italy, Paris, p. 138; IEA (International Energy Agency) 1999, Energy policies of IEA countries: Italy, Paris, p. 51.

[332] EEA (European Environment Agency), 2013, Air pollution fact sheet 2013: Italy, Copenhagen.

Air pollution taxes could be extended to inland shipping, which in many coastal cities is a major contributor to air pollution. Air pollution surtaxes on port fees according to motor properties would be justified and could be instrumental in relation to evasion risks. Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2015 to maximum levels by 2020. The rates are then held constant in real terms.

- **Water abstraction:** To improve efficiency in the usage of the water supply system, in particular the high leakage rates and the urgent need for raising capital to invest in renewal of the water infrastructure, it is suggested to fundamentally modernise the *imposta sul consumo d'acqua'*, Italy's water consumption tax. Applying 'good European practice' would - with relative price levels in Italy - imply tax rates of €400 per 1,000 m^3 for the public water supply and €250 per 1,000 m^3 for manufacturing purposes, while for agriculture €35 per 1,000 m^3. The charging base for irrigation should be changed so that it reflects water abstraction, not arable area. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. In view of the high pressure on water resources in Italy, and the phasing out of financial support for the water sector, revenues could very well be ring-fenced for regional water funds in line with the institutional model in other MS (France, Poland etc) or part of the revenues could be accrued to the national budget.
- **Waste water:** Italy has no levy on water pollution despite the significance of bathing water tourism. To improve prevention of water pollution and reflect better the environmental burdens it is suggested to adjust tax rates in-line with 'best practice'. With relative price levels in Italy this would imply a rate of €2.25 per kg BOD. For fresh-water discharges also phosphorus should be charged, while for coastal discharges a charge on nitrogen could be relevant. A transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  There is a tax on pesticides in Italy with its small revenues ring-fenced for organic and quality farming. Active ingredients in pesticides are harmful to the environment and taxing it helps reduce the volume of active ingredients in the products. It is suggested that Italy implements a more substantial pesticides tax, and shift from the current approach to a banded tax set at a rate equivalent to €15 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate is kept constant in real terms.

- **Fertilisers**: Italy does not currently implement a tax on nitrogen (or other) fertilisers. A tax on the use of nitrogen in fertilisers is suggested at a rate of 0.25 €/kgN and implemented over the period from 2016 to 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies are listed in Table 44, and are described further below.

Table 56: Some Environmentally Harmful Subsidies (Italy)

Subsidy	Amount involved (€ million, real 2013 terms)
ENERGY	
Exemptions for LPG used in certain industrial plants and large industrial users of natural gas	62
Users of fuels who reside in poor, remote areas	238
Trucking companies obtain partial refunds on fuel taxes	356
Reduced rate for gas oil used as a motor fuel in agriculture, horticulture, forestry, and aquaculture	935
Fuel tax exemption for the transportation of goods and passengers along national waterways and within EU waters, including the use of fuel in the fisheries sector.	563
Special VAT rates for heating fuels	2,280
TRANSPORT (excl. transport fuels)	
Favorable treatment of company cars through the tax system	2,132 - 4,265
POLLUTION & RESOURCES	
Reduced water fees for farmers	-
Total	6,566 – 8,698

Sources:

Table 5 in IEEP (2013) Steps to Greening Country Report: Italy, Report for the European Commission, pp.15-16

OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 225-230, dx.doi.org/10.1787/9789264187610-en*

Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf

OECD (2013) Inventory of estimated budgetary support and tax expenditures for fossil fuels, Copenhagen Economics (2009) Company car taxation,

Taxation papers, Bruxelles: European Commission DG TAXUD.

In addition to the above, the following comments are made:

- **Energy:**
  - The VAT rate for heating fuels should be normalized to the standard rate and special rates abandoned. Normalizing the VAT rate for household natural gas consumption from 10% to the standard rate of 21% would yield **€80 million** for the tax component, but up to **€2.2 billion** for gas consumption per se. With 19 million household consumers of natural gas in Italy[333] their VAT advantage is, on average, worth merely €10/month for which a complex multi-tiered accounting system must be maintained.
  - For electricity the granting of a tax exemption for all users is very costly. It should be considered to target exemptions to low-income households with a green cheque, at a special value but independent of actual consumption. It should be considered to extend the municipal surtax on electricity to business and services.
- **Transport (excl. transport fuels):**
  - Company cars receive favorable treatment in the tax system.
  - New vehicles based on LPG and natural gas results in a significant loss in motor fuel revenues, about €1.6 billion annually. Considering that the CO_2-emissions are, respectively, 7% (LPG) and 17% (CNG) less than for petrol per GJ, the current scheme gives significant advantage to alternative vehicles, even if ancillary clean air benefits in urban areas are worthy of a premium. It is suggested to phase out gradually the subsidies to a level that can be justified by the environmental burdens (external costs) related to CO_2 and air pollution in particular. Note that this preferential treatment would be addressed through the suggested harmonization of transport fuel duties disrobed above.
- **Pollution and Resource:**
  - Although legislation has been introduced to ensure full-cost pricing, the tariffs for water supply and in particular user charges for sewage appear from data in Eurostat's Household Budget Survey to be fairly low in Italy: €67 per capita per annum for water supply and €15 per capita per annum for sewerage. A recent OECD review observes, that there is not full-cost recovery for economic and environmental costs in many ATO's, while pointing out that *"cost-recovery problems are aggravated by the approach to billing, which allows payments to be made at the end of the year, and relatively common non-payment of bills, especially in the South"*. [334] Moving towards more comprehensive cost recovery and appropriate incentives for water use should be a priority for the oversight authority. This should be considered in the context of suggestions for taxes on abstraction and discharge to water bodies made above.

[333] IEA (International Energy Agency) (2009) Italy 2009 Review, Paris, p. 19.

[334] OECD (2013) Environmental Performance Reviews: Italy 2013, Paris, p. 135.

- Although irrigation is responsible for half the water demand, charges for irrigation are "negligible" with a tendency for municipalities to grant exemptions.[335] The legal basis for exemptions needs to be made transparent and non-discriminatory in line with EU Treaty obligations, while limiting exemptions to a minimum. The charging base for irrigation permits should be changed so that it reflects water abstraction, not arable area. Again, this should be considered in the context of the suggested tax on the abstraction of water outlined above.

13.2.3 Summary of Revenue Outcomes

Table 57 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 57: Potential Additional Revenue from Environmental Fiscal Reform in Italy, million EUR (real 2013 terms)[336]

Type	2016	2020	2025
Energy			
Transport fuels	798	3,867	6,081
C&I / Heating	282	1,336	2,062
Electricity	2,394	2,394	2,394
Sub-total Energy, million EUR	3,474	7,596	10,537
Sub-total Energy, % GDP	0.22%	0.45%	0.59%
Transport (excl. transport fuels)			
Vehicle Taxes	710	3,726	3,954
Passenger Aviation Tax	1,694	3,554	3,881
Freight Aviation Tax	0.47	0.86	0.81

[335] A. Kraemer and M. Buck (1996) Water subsidies and the environment, OCDE GD(97)220, Paris.

[336] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Sub-total Transport, million EUR	2,405	7,280	7,837
Sub-total Transport, % GDP	0.15%	0.43%	0.44%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	436	572	590
Landfill Tax - Inerts (C&D)	2	1	1
Incineration /MBT Tax	112	167	173
Air Pollution Tax	116	199	162
Water Abstraction Tax	1,858	4,186	4,094
Waste Water Tax	197	275	275
Pesticides Tax	545	1053	1074
Aggregates Tax	819	472	449
Packaging Tax	353	341	348
Single Use Bag Tax	0	0	0
Fertiliser Tax	0.062	0.105	0.091
Sub-total Pollution & Resource, million EUR	4,438	7,266	7,167
Sub-total Pollution & Resources, % GDP	0.28%	0.43%	0.40%
Total Environmental Taxes			
Total, million EUR	10,317	22,143	25,540
Total Increase, % GDP	0.64%	1.31%	1.43%
Total Environmental Harmful Subsidies			
Total, million EUR	7,632	7,632	7,632
Total Increase, % GDP	0.49%	0.48%	0.47%
Total Potential for Environmental Fiscal Reform			
Total, million EUR	**17,949**	**29,775**	**33,172**
Total Increase, % GDP	**1.13%**	**1.79%**	**1.90%**

13.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, EUR 966 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in the use of transport fuels, natural gas and coal by industry, reduced SOx, NOx and PM10 emissions from stationary sources, reduced reliance on landfills and reduced passenger flights.

Table 58: Monetised Environmental Benefits from Implementation of Taxes, million EUR (real 2013 terms)

Tax Type	2016	2020	2025
Energy	109	283	390
Transport	42	111	115
Pollution & Resources	119	524	462
Total, million EUR	271	918	966
Total, % GDP	0.02%	0.06%	0.06%

13.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Italy:[337]

- In 2012 environmental taxes generated revenue equivalent to 3.02% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **€10 billion** in 2016, rising to **€26 billion** in 2025 (both in real 2013 terms). This is equivalent to **0.64%** and **1.4%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be between **€6.6 billion** and **€8.7 billion** in 2016 (real 2013 terms), equivalent to **0.42%** to **0.55%** of GDP (the average of the two figures is reported in Table 57 above).
- The largest additional source of revenue comes from the suggested harmonisation of taxes on transport fuels. It was suggested that duties on transport fuels be equalised

[337] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

using the energy content of petrol. If this were to occur an additional **€6.1 billion** of revenue could be generated by 2025 (real 2013 terms), equivalent to **0.29%** of GDP.

- It is estimated that the suggested modernisation of Italy's water consumption tax could generate an additional **€4.1 billion** by 2025 (real 2013 terms), equivalent to **0.19%** of GDP.
- The third largest contribution comes from suggested changes in vehicle taxation. This accounts for **€4 billion** by 2025 (real 2013 terms), equivalent to **0.19%** of GDP. It was suggested that the increase in transport taxes could be achieved through adjusting circulation taxes to incorporate banding of tax rates in line with emissions, and ensuring that vehicles other than passenger vehicles are also included in such banding.
- The suggested introduction of a tax on passenger flights could yield **€3.9 billion** by 2025 (real 2013 terms), equivalent to **0.18%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- The harmonisation of the tax on electricity used by businesses could generate an additional **€2.4 billion** by 2025 (real 2013 terms), equivalent to **0.11%** of GDP.
- In addition, minor taxes on, *inter alia*, pesticides, landfilling, the extraction of aggregates, packaging, the discharge of waste water, and air pollution, could generate revenue of **€3.9 billion** by 2025 (real 2013 terms), equivalent to **0.19%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **€0.97 billion** (real 2013 terms), or **0.06%** of GDP in 2025.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *Shift the tax burden from labour and capital to consumption, property and the environment in a budgetary neutral manner.*

The above suggestions give some indication of how environmental taxes might be used to contribute to the recommended tax shift.

14.0 Lithuania

14.1 Country Overview

14.1.1 Key Facts about the Economy and Tax System

- Lithuania's GDP grew rapidly between 2004 and 2007 at an average annual rate of 8.2% in real terms. In 2008 GDP growth fell by 2.9% in real terms, followed by a severe contraction of the economy in 2009 when GDP fell by a further 15% in real terms. Subsequent years have seen a return to growth, albeit at slower rates than in the 2000's, with GDP growing by 1.6% in 2010, 6% in 2011, and 3.7% in 2012, all in real terms.[338]
- Revenue from taxes and social security contributions amounted to just 27% of Lithuania's GDP in 2012, the lowest level in the past decade (the highest level was in 2008 when tax revenue was 31% of GDP).[339]
- In 2012 (the latest year for which Eurostat data on revenue from environmental taxes are available), environmental taxes accounted for 1.66% of GDP. This is the lowest proportion in a decade, with a steady decline having occurred since 2003 when revenue derived from environmental taxes was 2.79% of GDP.[340]
- The largest proportion of revenue derived from environmentally-related taxation are obtained through energy taxes. In 2012, revenue from energy taxes amounted to 1.57% of GDP down from a high of 2.0% of GDP in 2002. Revenue derived from pollution/resources and transport taxes (excl. transport fuels) have produced smaller revenue streams, with both groups of taxes generating revenue equivalent to 0.05% of GDP in 2012.[341]

14.1.2 Relative Position within the EU

Lithuania's position relative to the EU-28 is summarised in Figure 9 and Table 59 below:

- Figure 9 shows that as a share of GDP Lithuania's environmental tax revenue in 2012 was substantially below the EU-28 level of 2.29% of GDP. Revenue derived from energy taxes was also below the EU-28 level. As a proportion of GDP, Lithuania also derived far

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[338] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

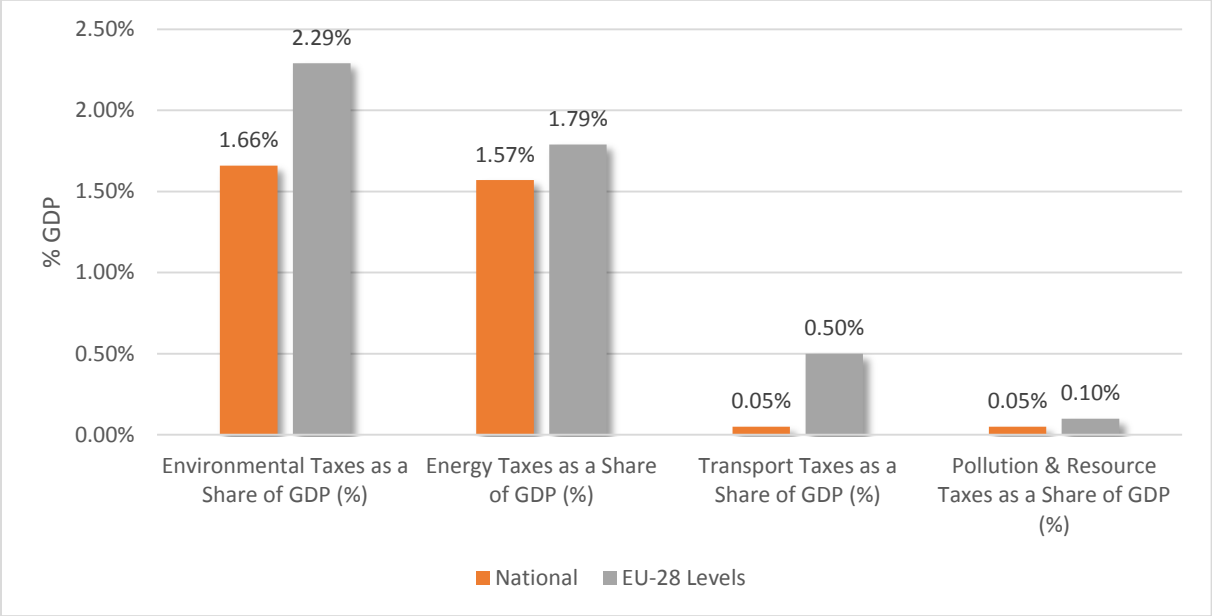
[339] Eurostat (2013) *Main National Accounts Tax Aggregates [gov_a_tax_ag]*, Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[340] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[341] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

less revenue, relative to the EU-28 level, from transport taxes (excl. transport fuels). Revenue from pollution and resource taxes was also low compared with the average.[342]

Figure 9: Environmental Taxes as a % of GDP vs EU-28 Averages, 2012



Source: Eurostat data

- In 2012, within the EU-28, Lithuania was in 27th position in terms of revenue derived from environmental taxes as a proportion of GDP (Table 59). In terms of energy tax revenues, Lithuania was in 23rd place in the same year. It is in last place with respect to revenue derived from transport taxes (excl. transport fuels) as a proportion of GDP, but in 17th position with regards to revenues derived from pollution and resource taxes.[343]

Table 59: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	27
Energy Taxes as a Share of GDP (%)	23
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	28
Pollution & Resource Taxes as a Share of GDP (%)	17

Source: based on Eurostat data

[342] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[343] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

14.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax are given in the Appendix (the Appendix also includes a detailed list of references for all of the information cited in this section). This section summarises key aspects of the main environmental taxes, and describes, for energy, how the rates compare with European averages and with the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[344,345]

- **Energy:** The Lithuanian excise duties on fuels and electricity are shown in Table 18, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 60: Standard Rates of Excise Duties on Fuels and Electricity in Lithuania

Excise Duty	Unit	Rate Applied in Lithuania[2]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	per 1,000 litres	LTL 2,000 (€579)	€421	€580	€583
Unleaded Petrol	per 1,000 litres	LTL 1,500 (€434)	€359	€536	€515
Gas Oil (Diesel)	per 1,000 litres	LTL 1,140 (€330)	€330	€425	€412
Kerosene	per 1,000 litres	LTL 1,140 (€330)	€330	€434	€410
Liquid Petroleum Gas	per 1,000 kg	LTL 1,050 (€304)	€125	€197	€176
Natural Gas	per GJ	LTL 23 (€6.55)	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil	per 1,000 litres	LTL 1,140 (€330)	€21	€233	€242
Kerosene	per 1,000 litres	LTL 1,140 (€330)	€21	€300	€330
Liquid Petroleum Gas	per 1,000 kg	LTL 1,050 (€304)	€41	€134	€125
Natural Gas	per GJ	LTL 0 (€0)[1]	€0.30	€1.90	€1.25

[344] Eurostat (2013) ECU/ECR Exchange Rates versus National Currencies, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[345] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Lithuania[2]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Heating – Business Use					
Gas Oil	per 1000 litres	LTL 73 (€21)	€21	€178	€122
Kerosene	per 1,000 litres	LTL 1,140 (€330)	€0.00	€265	€330
Heavy Fuel Oil	per 1,000 kg	LTL 52 (€15)	€15	€71	€25
Liquid Petroleum Gas	per 1,000 kg	LTL 0 (€0)	€0.00	€78	€42
Natural Gas	per GJ	LTL 0 (€0)[1]	€0.15	€1.38	€0.59
Coal and Coke	per GJ	LTL 0.52 (€0.15)	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil	per 1,000 litres	LTL 73 (€21)	€21	€185	€123
Kerosene	per 1,000 litres	LTL 1,140 (€330)	€0.00	€275	€330
Heavy Fuel Oil	per 1,000 kg	LTL 52 (€15)	€15	€75	€25
Liquid Petroleum Gas	per 1,000 kg	LTL 0 (€0)	€0.00	€110	€43
Natural Gas	per GJ	LTL 0 (€0)[1]	€0.30	€2.11	€1.07
Coal and Coke	per GJ	LTL 1.0 (€0.30)	€0.30	€1.69	€0.32
Electricity					
Business Use	per MWh	LTL 1.80 (€0.52)	€0.50	€10.23	€1.21
Non-Business Use	per MWh	LTL 3.50 (€1.01)	€1.00	€14.68	€1.91
Note: Lithuania has an exemption under Article 15(1)(g) of Council Directive 2003/96/EC. The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013) ECU/ECR Exchange Rates versus National Currencies, Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12.					

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- The excise duties on energy products and electricity show that Lithuanian is meeting or exceeding the minimum rates set out in Directive 2003/96/EEC. The only exception for the 2013 rates is for natural gas for which Lithuania has an

exemption under Article 15(1) g. of Directive 2003/96/EEC. However, exemptions under this article are only valid up to a maximum period of 10 years after the Directive came into force, in principle rates should increase in 2014.[346]

- In comparison to the European average and median tax rates across the EU-28, Lithuania compares quite favourably in a number of instances; for example, leaded petrol (although this is barely relevant today) and kerosene. In a number of other instances, such as, unleaded petrol and diesel, excise duties are well below average European rates.
- In 2012 revenues from energy excise duties amounted to LTL 1.78 billion (€516 million), equivalent to 1.54% of GDP.[347]

➢ **Transport (excl. transport fuels):**

- There is a one off tax on the importation of vehicles into Lithuania. In 2009 imported vehicles aged between 7 and 10 years were levied at 5% of their customs value, whilst vehicles more than 10 years old were levied at a rate between 10% and 20% of their customs value.
- There is an annual circulation tax in place for heavy vehicles. There are a number of rates which apply, depending on the weight of the vehicle and the type of axle.

➢ **Pollution and resources:**

- Lithuania's tax on pollution is imposed on the following:
  - Pollutants discharged into the environment from both stationary and mobile sources (mobile sources include vehicles, vessels, trains, and airplanes). Tax rates are banded according to the mode of transport and the type of fuel used;
  - Specified goods (tyres, accumulators used in transport vehicles and others); and
  - Specified filled packaging (glass, plastic, metal, paper and other packaging).
- Revenue derived from these taxes was €17 million in 2012 (this equates to 0.05% of GDP).
- Lithuania also applies a tax on a number of natural resources including, for example, amber, anhydrite, chalk marl, clay, dolomite, limestone, peat, and

[346] COUNCIL DIRECTIVE 2003/96/EC of 27 October 2003 Restructuring The Community Framework for the Taxation of Energy Products and Electricity, http://ec.europa.eu/taxation_customs/resources/documents/taxation/com_2011_169_cod_en.pdf

[347] DG TAXUD (2013) *Excise Duty Tables (Tax receipts – Energy products and Electricity)*, July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

sand/soil. Taxes on natural resources raised €19 million in 2012 (equivalent to 0.06% of GDP).[348]

- Water abstraction charges in Lithuania are charged per cubic metre and vary depending on the end use, ranging between €0.0001 per m^3 (for surface water used for cooling or for fisheries) and €1.3 per m^3 (for the extraction of mineral drinking water).
- Lithuania also charges for the supply of water. In 2009 these charges ranged from €0.37 to €0.46 per m^3 for domestic users and €0.36 to €0.56 per m^3 for other users. Charge rates differ from one municipality to another depending on service provider and category of water user.
- Lithuania has a number of additional minor resource related taxes/charges in place. These include forest felling charges, a nature protection non-compliance fee, and a waste disposal non-compliance fee. The non-compliance fee can be seen more as a fine and is based on the type and severity of the offense committed (it is charged on a case by case basis).
- Companies are also liable to pay a tax on the extraction of oil and natural gas within Lithuania. The tax rate varies depending on the amount of product extracted annually, with an additional 9% being payable if the prospecting work is funded by the State. In 2012 this tax generated revenue of €10 million (equivalent to 0.0003% of GDP). It should be noted that taxes on the extraction of oil or gas have now been removed from the definition of environmental taxes.[349]

➢ A number of environmentally harmful subsidies have been identified as part of work undertaken by IEEP and IVM, and from Excise Duty Tables.[350,351,352] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 14.2.2 (all subsidies are detailed in Appendix A.8.4).

14.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Lithuania. This is then followed by a summary of proposed changes to existing tax rates and/or

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[348] European Commission (2013) *"Taxes in Europe Database" Lithuania, Tax on State Natural Resources*, Accessed 2th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html. Note that the Ministry suggests these are not included as environmental taxes under the Eurostat methodology because of their ownership.

[349] European Commission (2013) *Taxation Trends in the European Union: Data for the EU Member States, Iceland and Norway, 2013 Edition,* Luxembourg: Publications Office of the European Union.

[350] See Table 6 in IEEP (2013) *Steps to Greening Country Report: Lithuania*, Report for the European Commission, p.10.

[351] IVM Institute for Environmental Studies (2013) *Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries*, Final Report, 15 January 2013, pp.38-40. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

[352] *DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

proposed applications of new taxes. Out-turns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

14.2.1 Current Status of EFR

The Lithuanian government has not given significant attention to the potential for EFR within the country. This is reflected in the country's ranking in respect of tax revenues as shown in Table 59 above.

Many of the changes to environmental taxes and subsidies have been driven by its accession to the European Union in 2004 and the need to meet the obligations set out in European Directives. According to Lithuania's National Reform Programme for 2013, there may be growing interest in the subject of EFR. Under the section concerning resource efficiency, the National Reform Programme states that the following activities are planned for 2013:

- *"Identification of environmentally harmful subsidies, determination of their value in the common national tax system. Preparation of methodology for identification of environmentally harmful subsidies"; and*
- *"Identification of taxes promoting environmental protection in the common tax system. Proposals for increase of taxes promoting environmental protection and introduction of new taxes adequately reducing taxes of other types".*[353]

The European Council reviewed Lithuania's National Reform Programme and issued the following country specific recommendations for consideration as part of the country's 2014 National Reform Programme:

> *"Review the tax system and considering increasing those taxes that are least detrimental to growth, such as…environmental taxation, including introducing car taxation, while continuing to reinforce tax compliance."*
>
> *"Step up measures to improve the energy efficiency of buildings, including through removing disincentives and rapid implementation of the holding fund. Promote competition in energy networks by improving interconnectivity with other Member States for both electricity and gas".* [354]

Relative to the rest of Europe Lithuania only collects a very small proportion – as a percentage of GDP – of its tax revenue through environmental taxes. Accordingly, there is significant room to increase revenue from environmental taxes, as many observers have clearly recognised.

14.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

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[353] Lithuania Government (2013) *Lithuania: National Reform Programme 2013*, http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/, p. 62

[354] European Commission (2013) *Country Specific Recommendations, Accessed 23rd August 2013,* http://register.consilium.europa.eu/doc/srv?l=EN&t=PDF&gc=true&sc=false&f=ST%2010643%202013%20REV%201&r=http%3A%2F%2Fregister.consilium.europa.eu%2Fpd%2Fen%2F13%2Fst10%2Fst10643-re01.en13.pdf, pp.8-9.

Adjustments to existing taxes or new taxes:

- Energy Taxes:
  - Energy taxes are harmonised based upon the highest energy content of all of the different fuels used for each purpose (propellants, heating etc). Transport fuels are equalised using the energy content on petrol (€11.9 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€7.9 per GJ). Finally, due to the existing rates for kerosene used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate of €0.15 per GJ. Note that this implies a reduction in the existing rate for kerosene from €330 to €56 per 1,000 litres, however, for the purposes of this analysis the existing rates have been maintained.
  - Table 61 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 61: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	434	434
Light fuel oil (diesel)	€/1000 litre	470	330
LPG (propellant)	€/1000 kg	604	304
Kerosene	€/1000 litre	472	330
Natural gas (prop)	€/GJ	13	7
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	330	330
Kerosene	€/1000 litre	332	330
LPG	€/1000 kg	422	304
Natural gas	€/GJ	9	0
BUSINESS HEATING			
Gas oil	€/1000 litre	57	21
Heavy fuel oil	€/1000 kg	68	15
Kerosene	€/1000 litre	330	330

	Units	Suggested Rates	Existing Rates
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.00
Coal	€/GJ	2.04	0.15
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	57	21
Heavy fuel oil	€/1000 kg	68	15
Kerosene	€/1000 litre	330	330
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.00
Coal	€/GJ	2.04	0.30
ELECTRICITY			
Electricity - business use	€/MWh	1.01	0.52
Electricity - non-business use	€/MWh	1.01	1.01

- Transport Taxes (excl. transport fuels):
  - **Vehicles:** The taxes on transport in Lithuania are the lowest in the EU (0.05% of GDP compared to an average of 0.54% GDP). Considerable scope exists for introducing vehicle taxation, both as a means for raising revenue and for differentiating between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. A circulation tax differentiated by CO_2 emissions could be introduced with this in mind. Some differentiation according to other emissions, such as particulates, would also be useful. Lithuania has a tax on pollutants from vehicles used for commercial purposes but these are at very low levels. It may be more appropriate to replace this tax with a suitably differentiated circulation tax. Directive 2011/76/EU on the charging of heavy goods vehicles for the use of certain infrastructures sets common rules on distance-related tolls and time-based user charges (vignettes). There is no vignette for HGVs in Lithuania, these being subject only to a circulation tax which varies by weight and number of axles. It is suggested that using these measures, Lithuania could readily increase vehicle taxation by 0.5% of GDP. This figure is applied to future projections of real GDP in order to calculate revenue potential in future years. The increase is phased in over the period from 2015 to 2020.
  - **Aviation:** Currently there is no aviation tax in Lithuania. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending

the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Lithuania (note there are very few internal flights, according to Eurostat data), €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

- **Pollution and Resource Taxes:**
  - **Waste – landfill tax:** There is currently no landfill tax in place in Lithuania; according to BiPRO, there are plans in place to introduce a tax once sufficient alternative residual waste treatment capacity has been built.[355] However, the tax itself should be considered as an incentive to develop such treatments, as well as to encourage waste prevention and recycling. Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. A landfill tax would also give support to the application of the waste hierarchy. It is reported that the proposed landfill tax will be in the region of €21 to €45 per tonne of non-hazardous waste landfilled. It is suggested that the rate of landfill tax for non-hazardous wastes is raised to a minimum of €50 per tonne by 2020. An early announcement of this tax and its escalation over a number of years would help drive the change in the waste management sector needed to meet EU targets in 2020 and beyond. It is also suggested that a landfill tax be introduced for construction wastes in 2016. We have suggested a rate of €2.40 per tonne. We suggest these taxes should be indexed to an appropriate measure of inflation.
  - **Aggregates:** An aggregates tax helps reduce extraction rates for aggregates, and stimulates the market for the use of secondary materials.[356] The instrument works well alongside taxes for landfilling of construction and demolition wastes. This approach is aligned with the Roadmap to A Resource Efficient Europe.[357] Lithuania already taxes the extraction of aggregates, but at rates which could be raised to further promote the efficient use of resources (an average rate of €0.70

[355] BiPRO (2013) *Country Fact Sheet for Lithuania*, Report for the European Commission, p. 4

[356] European Environment Agency (2008) *Effectiveness of Environmental Taxes and Charges for Managing Sand, Gravel and Rock Extraction in Selected EU Countries*, June 2008, www.eea.europa.eu/publications/eea_report_2008_2

[357] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

per tonne was calculated based upon 2012 revenues and total mineral extraction). It is suggested that Lithuania increases its existing taxes on the following materials:

- Chalk and dolomite
- Limestone and gypsum
- Sand and gravel

It is suggested that the tax rate on the above aggregates be raised to a rate of €2.40 per tonne by 2016, and following this, to keep the rate constant in real terms. It is also proposed that this tax rate be applied to slate and marble, at least to the extent that they are extracted in Lithuania.

- **Waste – incineration / MBT tax:** There is currently one incinerator operating in Lithuania with a further two are in the pipeline.[358] In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne over the same period as the landfill tax is increased (i.e. up to 2020). An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.[359]
- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is worth noting that Lithuania has a deposit refund scheme in place for beverage packaging which drives the recycling of packaging, but not necessarily waste prevention effects beyond, potentially, maintaining shares of reusable beverage packaging.[360] There is a packaging tax in place, but this is exempted if producers register with PRO schemes for the recovery of waste packaging. The tax is therefore unlikely to drive significant improvements across the sector. It is suggested that the following rates could be applied to all packaging placed on the market in Lithuania (other than that subject to the deposit):
    - Aluminium €197 per tonne
    - Plastic €64 per tonne
    - Steel €54 per tonne

[358] BiPRO (2013) *Country Fact Sheet for Lithuania*, Report for the European Commission, p. 4

[359] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[360] Ministry of Environment of the Republic of Lithuania (2013) *Deposit Scheme can be Extended to Plastic and Metal Packaging from 2015*, Published 1st October 2013, Accessed 21st January 2014, www.am.lt/VI/en/VI/article.php3?article_id=464

- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax**: There is currently no tax on single-use carrier bags in Lithuania. Plastic bags cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the marine environment. As such, marine litter is specifically mentioned as a pressure in the Marine Strategy Framework Directive (2008/56/EC).[361] A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[362] Therefore, it is suggested that Lithuania implements a tax on single-use plastic bags at a rate of €0.06 per bag from 2015, and following this to keep the rate constant in real terms.
- **Air pollution:** There is a tax on air pollutants emitted from stationary sources in Lithuania. The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies, and therefore improve local air quality and the health of the population. There have been some improvements in air quality over the last decade, but despite this some issues remain.[363] For example in recent years up to 20% of the urban population was exposed to air pollution exceeding EU air quality objectives.[364] It is suggested that the existing rates under the Law on Pollution Charges could be increased further to generate additional incentives for abatement, and hence, improvements in air quality. The suggested rates are as follows:
    - SOx €1,000 per tonne
    - NOx €1,000 per tonne
    - PM_{10} €2,000 per tonne

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[361] DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF

[362] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[363] See: IEEP (2014) Member States' Achievements in Selected Environmental Policy Areas: Lithuania, p. 23.

[364] EEA (2013) *Air pollution fact sheet 2013 Lithuania*, http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets/lithuania-air-pollutant-emissions-country-factsheet/view

Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates should then be held constant in real terms.

- **Water abstraction:** A central theme of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*. Lithuania already applies a tax on the abstraction of groundwater for use by households and businesses. However, in order to improve efficiency in the usage of the water supply system it is suggested that the existing rates are increased to levels of €80 per 1,000 m^3 for the public water supply, €50 per 1,000 m^3 for manufacturing purposes and €7 per 1,000 m^3 for the agriculture sector (the existing rate for 'other' ground water extraction when applied to the agriculture sector is already above the minimum suggested here). A transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. The rates should then be held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[365] Lithuania has waste water charges with the rate for organic material at €0.257 per kg BOD. To improve prevention of water pollution it is suggested to increase this rate in line with good practice to €1.35 per kg BOD. For fresh-water discharges also phosphorus should be charged potentially above the existing rate. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  Lithuania's National Pesticide Action Plan does not set any objective reduction targets for the use of pesticides. However, the Plan recognises the need to protect the environment and human health and the general need to reduce the use of

[365] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

pesticides. The Action Plan includes the following measure as a means of tracking the successful implementation of the Plan:

> *"Changes in the amount of utilised quantities of active substances of plant protection products".*[366]

There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable Lithuania. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €5 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would support progress towards the objectives set out in the National Pesticide Action Plan.

- Fertilisers: There is currently no tax of fertilisers in Lithuania. Intensification of the agriculture and increased use of mineral fertilisers cause leakage of nutrients into the environment and eutrophication. Eutrophication is the major environmental concern in the Baltic Sea. The whole territory of Lithuania is part of the catchment area of the Baltic Sea. It is therefore suggested that a tax on the use of non-organic nitrogen in fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that a rate of €0.10 per kilogram of nitrogen be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study are listed in Table 32. Further details of our calculation methodology are available in Appendix A.8.4, in which we also present a full list of subsidies for which no figures for forgone revenues are available.

[366] See the table in Annex 1 in: Ministry for Agriculture of the Republic of Lithuania (2012) *Official Gazette 2012, No 76-3970; 2012, No 105-5354, on the Approval of a Plant Protection Plan*, June 2012, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm

Table 62: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (LTL million, real 2013 terms)
ENERGY	
Excise tax exemption for gas oil used in agriculture and fisheries	56.3[1]
Excise tax exemption for motor spirit used in shipping	2.0[1]
Excise tax exemption for kerosene used in shipping	1.4[1]
Excise tax exemption for gas oil used in shipping	15.1[1]
Total	74.8

Notes:

1) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm# and IVM Institute for Environmental Studies (2013) Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries, Final Report, 15 January 2013, pp.38-40. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf*

2)

14.2.3 Summary of Revenue Outcomes

Table 63 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 63: Potential Additional Revenue from Environmental Fiscal Reform in Lithuania, million LTL (real 2013 terms)[367]

Type	2016	2020	2025
Energy			
Transport Fuels	71	346	546
C&I / Heating	7	32	49
Electricity	2	6	8
Sub-total Energy, million LTL	79	384	604
Sub-total Energy, % GDP	0.06%	0.25%	0.32%
Transport (excl. transport fuels)			
Vehicle Taxes	128	748	905
Passenger Aviation Tax	153	337	388
Freight Aviation Tax	0.04	0.08	0.08
Sub-total Transport, million LTL	281	1,085	1,294
Sub-total Transport, % GDP	0.21%	0.69%	0.68%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	150	283	259
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	4	15	19
Air Pollution Tax	54	105	101
Water Abstraction Tax	9	21	22
Waste Water Tax	27	38	38
Pesticides Tax	10	21	22
Aggregates Tax	154	78	91
Packaging Tax	33	34	37
Single Use Bag Tax	364	79	87

[367] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Fertiliser Tax	0.024	0.046	0.046
Sub-total Pollution & Resource, million LTL	807	673	676
Sub-total Pollution & Resources, % GDP	0.60%	0.43%	0.36%
Total Environmental Taxes			
Total, million LTL	1,167	2,142	2,574
Total Increase, % GDP	0.87%	1.37%	1.36%
Total Environmental Harmful Subsidies			
Total, million LTL	75	75	75
Total Increase, % GDP	0.06%	0.06%	0.06%
Total Potential for Environmental Fiscal Reform			
Total, million LTL	**1,242**	**2,217**	**2,649**
Total Increase, % GDP	**0.93%**	**1.43%**	**1.42%**

14.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, LTL 269 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in SOx, NOx and PM10 emissions, reduced diesel and coal consumption and reduced reliance on landfills.

Table 64: Monetised Environmental Benefits from Implementation of Taxes, million LTL (real 2013 terms)

Tax Type	2016	2020	2025
Energy	4	20	30
Transport	7	19	20
Pollution & Resources	74	224	219
Total, million LTL	85	264	269
Total, % GDP	0.07%	0.19%	0.19%

14.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Lithuania:[368]

- In 2012 environmental taxes generated revenue equivalent to 1.66% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **LTL 1.2 billion (€0.34 billion)** in 2016, rising to **LTL 2.6 billion (€0.76 billion)** in 2025 (both in real 2013 terms). This is equivalent to **0.87%** and **1.4%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be **LTL 0.075 billion (€0.02 billion)** in 2016 (real 2013 terms), equivalent to **0.06%** of GDP.
- The largest revenue stream comes from suggested changes in vehicle taxation. This accounts for **LTL 0.9 billion (€0.3 billion)** by 2025 (real 2013 terms), equivalent to **0.34%** of GDP. It was suggested that the main changes could be in the circulation taxes, with these being differentiated according to the environmental performance of the vehicles.
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **LTL 0.5 billion (€0.2 billion)** of additional revenue in 2025 (real 2013 terms), equivalent to **0.21%** of GDP.
- The introduction of a tax on passenger flights could yield an estimated **LTL 0.4 billion (€0.1 billion)** by 2025 (real 2013 terms), equivalent to **0.15%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- The suggested introduction of a landfill tax on non-hazardous residual waste could generate an additional **LTL 0.3 billion (€0.1 billion)** of revenue in 2025 (real 2013 terms), equivalent to **0.1%** of GDP.
- A tax on emissions of air pollutants could yield an additional **LTL 0.1 billion (€0.03 billion)** of revenue by 2025 (real 2013 terms), equivalent to **0.04%** of GDP.
- In addition, minor taxes on, *inter alia*, single use carrier bags, the extraction of aggregates, water abstraction, and the discharge of waste water, could generate revenue of **LTL 0.4 billion (€0.1 billion)** by 2025 (real 2013 terms), equivalent to **0.14%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **LTL 0.27 billion (€0.08 billion)** in 2025 (real 2013 terms), or **0.19%** of GDP.

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[368] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *Review the tax system and consider increasing those taxes that are least detrimental to growth, such as recurrent property and environmental taxation, including introducing car taxation, while continuing to reinforce tax compliance.*

  The above package, or elements thereof, would clearly help to meet the objective in respect of environmental taxes and EHSs.

15.0 Poland

15.1 Country Overview

15.1.1 Key Facts about the Economy and Tax System

- Poland experienced stable economic growth between 2004 and 2008, with GDP increasing at an average rate of 5.4% per annum in real terms. Although Poland experienced the impact of the general economic downturn late in 2008, but it fared better than most other European countries, as its GDP growth rate remained positive throughout the recession, at 1.6% in real terms in 2009. The economy has continued to grow in more recent years, albeit at a slightly lower rate, with GDP increasing at an average rate of 3.4% per annum in real terms between 2009 and 2012.[369]
- Poland's overall tax revenue (including social contributions) is low compared to most Member States, at 32.0% of GDP in 2012. This ratio was similar in 2001, although tax revenues peaked at 35% of GDP in 2007.[370]
- In 2012, the largest proportion of Poland's tax revenue came from indirect taxes (40% of total tax revenue). Social contributions also formed a significant proportion of total taxation (38%), while direct taxes accounted for 22% of total tax revenue.[371]
- In 2012, revenue from environmental taxes accounted for 2.52% of GDP. This is a significant increase from 2001, when they only made up 2.1% of GDP. From its peak in 2006 at 2.74% of GDP, the proportion has, however, been declining in recent years.[372]
- The largest proportion of revenue from environmentally-related taxation in 2012 was from energy taxes, equivalent to 2.16% of GDP. Taxes on pollution and resources – all ring-fenced for Poland's national, regional and local environmental funds[373] - raised an amount equivalent to 0.17% of GDP, whilst taxes on transport (excl. transport fuels) accounted for just 0.19% of GDP.[374]
- The proportion of total environmental tax revenue realised from energy has fluctuated in recent years, with peaks of 86% in 2003, 2005 and 2007. In 2012, 86% of environmental tax revenues were accounted for by energy taxes. Transport tax revenues

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[369] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[370] Eurostat (2013) Main National Accounts Tax Aggregates [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[371] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[372] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[373] P Malecki (2010) The role of ecological fees in the functioning of Polish environmental protection and water management funds, Economic and environmental studies 10:1, 136-148; J Sarnacki (1999), Poland in J Klarer et. al. (eds) Sourcebook on economic instruments for environmental policy, Budapest: Regional Environmental Center for CEE.

[374] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

(excl. transport fuels) have accounted for a progressively declining proportion of environmental taxes, from 13% in 2004 to 8% in 2012. During this same period, the proportion of pollution and resource taxes has generally increased, from 3% in 2005 to 7% in 2011.[375]

15.1.2 Relative Position within the EU

- In 2012, total environmental tax revenues as a proportion of GDP were higher in Poland than for the EU-28 as a whole (see Figure 8).[376] This is mainly due to energy taxes being higher than the EU-28 level. Pollution and resource taxes are also above the EU-28 level. Transport taxes (excl. transport fuels) were, however, 0.31% of GDP, somewhat lower than the figure for the EU-28 as a whole.
- In 2012, Poland ranked 13th in the EU-28 in terms of the ratio of environmental taxes to GDP (Table 17).[377] Compared to the EU-28, Poland relies heavily on energy and pollution and resources taxes to make up the majority of its environmental tax revenue. It ranked 9th in 2012 on the ratio of energy tax revenue to GDP, and 8th for pollution and resources taxes. On transport taxes (excl. transport fuels), Poland ranked 22nd for the tax to GDP ratio.[378]

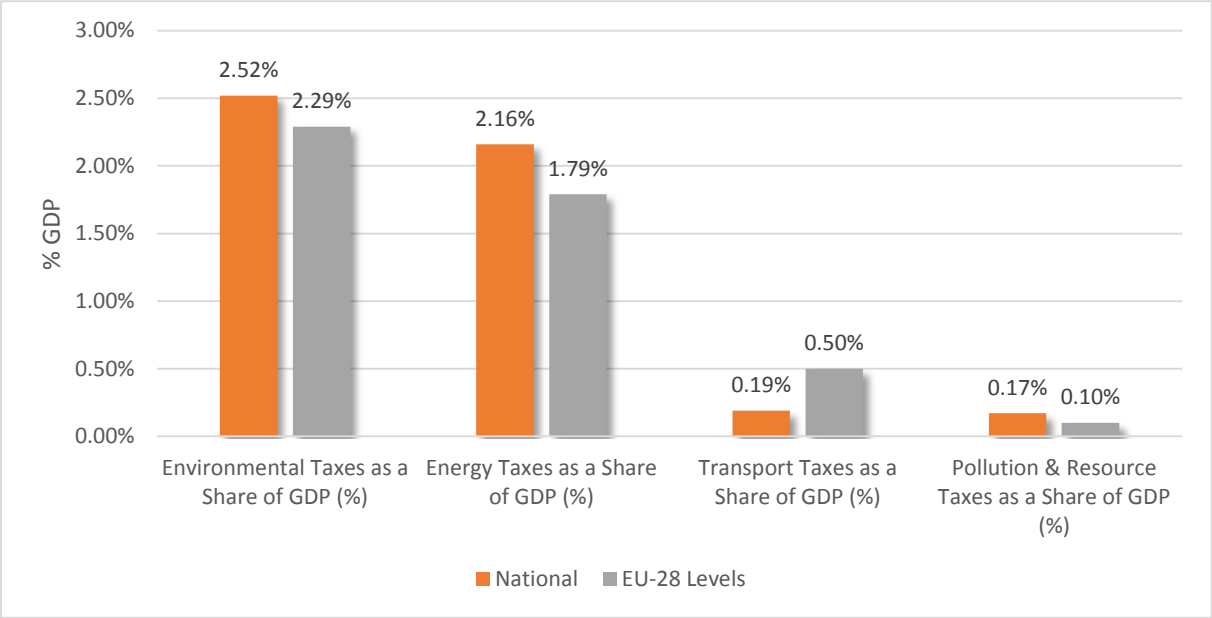
[375] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[376] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[377] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

[378] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Figure 10: Environmental Taxes as a % of GDP vs EU-28 Levels (2012)



Source: Eurostat data

Table 65: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	13
Energy Taxes as a Share of GDP (%)	9
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	22
Pollution & Resource Taxes as a Share of GDP (%)	8

Source: based on Eurostat data

15.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The structure and rates for each tax, as well as full references, are given in the Appendix. This section summarises key aspects of the main environmental taxes, and for energy, describes how the rates compare with European averages and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[379,380]

- **Energy:** The Polish excise duties on fuels and electricity are shown in Table 24, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

[379] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[380] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Table 66: Standard Rates of Excise Duties on Fuels and Electricity in Poland

Excise Duty	Unit	Rate Applied in Poland[4]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Unleaded Petrol	€ per 1000 litres	PLN 1,668.16 (€397)[1]	€359	€536	€515
Gas Oil (Diesel)	€ per 1000 litres	PLN 1,455.92 (€347)	€330	€425	€412
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)[2]	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	PLN 828.10 (€197)	€125	€197	€176
Natural Gas	€ per GJ	PLN 0 (€0)	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	PLN 1,455.92 (€347)	€21	€233	€242
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	PLN 828.10 (€197)	€41	€134	€125
Natural Gas	€ per GJ	PLN 0 (€0)	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	PLN 232.00 (€55)	€21	€178	€122
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)[3]	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	PLN 64.00 (€15)	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	PLN 0 (€0)	€0.00	€78	€42
Natural Gas	€ per GJ	PLN 0 (€0)	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	PLN 1.28 (€0.30)	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	PLN 232.00 (€55)	€21	€185	€123
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)[3]	€0.00	€275	€330

Excise Duty	Unit	Rate Applied in Poland[4]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Heavy Fuel Oil	€ per 1000 kg	PLN 64.00 (€15)	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	PLN 0 (€0)	€0.00	€110	€43
Natural Gas	€ per GJ	PLN 0 (€0)	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	PLN 1.28 (€0.30)	€0.30	€1.69	€0.32
Electricity					
Business Use	€ per MWh	PLN 20.00 (€4.76)	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	PLN 20.00 (€4.76)	€1.00	€14.68	€1.91

Notes:

1. This rate is for CN 2710 1145, and CN 2710 1149. CN 2710 1141 is taxed at a rate of PLN 1,822.00 (€434) per 1000 litres. CN 2710 1131 has a total exemption from excise duty

2. This rate is for CN 2710 1925. CN 2710 1921 is taxed at a rate of PLN 1,446.00 (€344). CN 2710 1921 has a total exemption from excise duty

3. This rate is for CN 2710 1925. CN 2710 1921 is taxed at a rate of PLN 232.00 (€55). CN 2710 1921 has a total exemption from excise duty for industry & commercial use.

4. The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013) ECU/ECR Exchange Rates versus National Currencies, *Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12 therefore the Euro rates in this table are not the same as the rates in the excise duty tables..*

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

Taxes on petrol and diesel were increased in the years prior to membership of the EU in 2004 and peaked about 2007-08. From that time the petrol tax has declined in real terms by around 20-25 per cent.[381] The diesel tax, after a minor dip, has returned to its initial level, close to the minimum in the existing ETD. As a result, the discrepancy between petrol and diesel taxation is fairly limited in Poland, and mainly defined by the existing ETD.

Discrepancies in tax rates for heating fuels are more exaggerated in that natural gas is not being taxed, whilst on the other hand, gas oil is taxed at a level compatible with the proposed ETD minimum rate. Gas is also treated more leniently than coal, which is the most important energy carrier for heating.

- **Transport (excl. transport fuels):**
  - There is an ad-valorem registration tax on purchase and imports, but no circulation tax on passenger vehicles in Poland. The registration taxes are not

[381] M.S. Andersen (2013) The decline and revival of environmentally-related taxation in Europe, in A Mori et al (eds) The green fiscal mechanism and reform for low carbon development, London: Routledge.

based on emissions but on engine capacity. The standard rate is 3.1 per cent of the purchase value, whilst for larger passenger vehicles (>2,000 cc engine capacity) it is 18.6 per cent according to information reported by Poland to OECD/EEA database.

- According to Eurostat's national tax list there are two further transport-related taxes in Poland; the transportation levy and the tax on means of transport. The transportation levy is a fee on driving licenses. The 'tax on means of transport' applies to vehicles larger than 3.5 tonnes. These two taxes together generate more of the transport-related revenues than the registration tax on passenger vehicles.

➢ **Pollution and resources:**

- In Eurostat's national tax list for Poland several pollution related taxes are lumped together in one line denoted 'levies on environmental exploitation'. This one line comprises the numerous different levies relating to waste, air pollution, water pollution and water abstraction which feature a high complexity of tax bases and tax rates (see Annex). The waste tax on mixed municipal waste as well as on other types of waste has seen a significant increase in recent years to discourage landfilling. The rate for mixed municipal waste was reported in 2012 to be PLN110 (€26.80) per tonne of waste, and is adjusted annually with in line with inflation.[382]
- For air pollution, the tax base includes more than 20 different emissions: besides the main pollutants of SO_2 and NO_x, numerous micro-pollutants are also taxed. According to data reported to OECD by Poland, the rate is €120 per tonne of SO_2 and NO_2, whereas the rate for greenhouse gases is €0.07 per tonne CO_2.[383]
- For water pollution, the tax base features about 20 different parameters, including both BOD and COD, but also, numerous other pollutants, such as potentially toxic metals. The tax rates are, by international standards, fairly substantial.[384] According to data reported to OECD by Poland, the rate is €980 per tonne of BOD for instance, but phosphorus and nitrates are absent from the list of parameters.[385]

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[382] C. Fischer et. al., 2012, Overview of landfill taxes in Europe, ETC/SCP working paper 1/2012, Copenhagen: European Topic Centre on SCP.

[383] OECD/EEA database on environmentally related taxes, fees and charges, other economic instruments and voluntary approaches used in environmental policy and natural resources management, update for Poland by 1.1.2013.

[384] EEA (2005) Effectiveness of urban wastewater treatment policies in selected countries: an EEA pilot study, EEA Report 2/2005, Copenhagen,

[385] OECD/EEA database on environmentally related taxes, fees and charges, other economic instruments and voluntary approaches used in environmental policy and natural resources management, update for Poland by 1.1.2013.

- For water abstraction, tax rates differ according to water bodies and the economic sectors of use, but appear quite modest. According to data reported to OECD by Poland, the highest rate is €30 per1,000 m^3 for groundwater abstracted for non-food production purposes. The rate for households is €0.10-20 per 1,000 m^3.[386]
- For air pollution and water pollution there are non-compliance fees for emissions exceeding allowable levels and the rates of these are several times the standard rates.[387]
- In addition to the above, several minor taxes related to resource use have been reported to the OECD/EEA database. These include an ad-valorem tax on plastic packaging at a rate of up to 20%. There are also charges on land use changes, premature harvesting of forests and bush and tree removals. A royalty tax on extraction of certain minerals was recently introduced (2012).

➢ **Environmentally Harmful Subsidies (EHSs):** The following are the main EHSs which have been identified and for which quantitative estimates have been made (further detail is given in Section 15.2.2):

- Reduced tax rates with regard to the use of motor fuels in Agriculture, horticulture, forestry, and aquaculture;
- Support for investments made by the coal industry.

15.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Poland. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as the basis for how the calculation of revenue generation. Outturns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

15.2.1 Current Status of EFR

Poland mobilized economic instruments to bolster its environmental policies following the transformation to a market economy from 1989, and did so in a way that attracted attention, both regionally and globally. The creation of independent environmental funds with responsibilities for environmental financing set a precedent for other countries in transition.[388]

This policy reform was followed by governmental interest in environmental fiscal reform in the years before entering the European Union in 2004. The '*National environmental policy for 2003-*

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[386] OECD/EEA database on environmentally related taxes, fees and charges, other economic instruments and voluntary approaches used in environmental policy and natural resources management, update for Poland by 1.1.2013.

[387] J. Sleszynski (1998) The Polish environmental policy: case study on implementation of SO2 emission charge, Economic discussion papers no. 40, Warsaw: Faculty of economic Sciences, Warsaw Univ.

[388] OECD (1995) Environmental funds in economies in transition, Paris; Cygler M (2002) Poland: National Fund for environmental protection and water management, pp. 127-136 in S Speck et al (eds) Environmental Funds in the candidate countries, Budapest: Regional Environmental Center for CEE.

2006 and its outlook for 2010'[389] envisioned the creation of an inter-ministerial '*Team on development of environmental tax reform*'. It was mandated to perform the calculation of external costs in all key sectors of the economy, and on this basis, to present proposals for increasing taxation on resources, with associated reductions in taxes relating to employment. These proposals were to be implemented in line with similar measures in other EU Member States.

Over the past decade interest in the conceptual approach has faded, but reforms, nevertheless, have been introduced to expand financing sources for the environmental funds, and some adjustment of tax rates on transport and energy can be observed, along with a more recent packaging tax. Still, one recent analysis concludes "we cannot observe implementation of environmental tax reform in Poland"[390]

Poland has an outdated physical infrastructure with considerable transmission losses with regard to electricity and heat.[391] Partly as a result, the energy intensity of Poland is far above the EU average. It supports the flow of revenues from taxation of energy, but is hardly beneficial for the economy overall.

15.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

<u>Adjustments to existing taxes or new taxes:</u>

- **Energy Taxes:**
  - Energy taxes are harmonised based upon the highest energy content of all of the different fuels used for each purpose (propellants, heating etc). Transport fuels are equalised using the energy content on kerosene (€10.8 per GJ). Motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€10.8 per GJ). Finally, due to the existing rates for gas oil used for heating being very close to the new minimum rates proposed for ETD, this proposal is applied to other heating fuels with the consistent approach implied (€0.15 per GJ and CO_2 at €20 per tonne). No changes are proposed for electricity.
  - Table 67 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.

[389] Council of Ministers in Republic of Poland (2002) National environmental policy for 2003-2006 and its outlook for 2010, Warsaw, p. 8.

[390] K. Dybiec (2013) Greening Polish and Lithuanian tax systems, Social Transformations in Contemporary Society 2013:1, 172-184.

[391] IEA (2012) Energy policies of IEA countries: Poland 2011 review, page 72.

Table 67: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Proposed Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	399	397
Light fuel oil (diesel)	€/1000 litre	432	347
LPG (propellant)	€/1000 kg	555	197
Kerosene	€/1000 litre	434	434
Natural gas (prop)	€/GJ	12	0
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	431	347
Kerosene	€/1000 litre	434	434
LPG	€/1000 kg	555	197
Natural gas	€/GJ	12	0
BUSINESS HEATING			
Gas oil	€/1000 litre	57	55
Heavy fuel oil	€/1000 kg	68	15
Kerosene	€/1000 litre	434	434
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.00
Coal	€/GJ	2.04	0.30
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	57	55
Heavy fuel oil	€/1000 kg	68	15
Kerosene	€/1000 litre	434	434
LPG	€/1000 kg	65	0
Natural gas	€/GJ	1.27	0.00
Coal	€/GJ	2.04	0.30

	Units	Proposed Rates	Existing Rates
ELECTRICITY			
Electricity - business use	€/MWh	4.76	4.76
Electricity - non-business use	€/MWh	4.76	4.76

- **Transport Taxes (excl. transport fuel):**
  - **Vehicles:** The taxes on transport in Poland are lower than average in the EU (0.19% of GDP compared to the figure for the EU-28 of 0.50% GDP), not least because Poland has no circulation tax for passenger vehicles in place. Emissions from the transport sector have increased by 1/3 since EU membership and are projected to increase further. Poland has, at 142g CO_2 per km, one of the highest average emission levels for new passenger cars in the EU-28 (exceeded only by Baltic States, Bulgaria, Hungary and Cyprus) and well above the EU target of 130g CO_2/km to be achieved by 2015.[392] Hence it is proposed that Poland should introduce a circulation tax with a tax base related to emissions in line with the Commission's 2005 proposal on passenger car taxes.[393] Such a tax could raise 0.43% of GDP in terms of revenue. For heavy-goods vehicles, opportunities for road-pricing in line with Directive 2011/76/EU (on the charging of heavy goods vehicles for the use of certain infrastructures) also deserves serious consideration and could further increase revenue generation.[394] The increase is phased in over the period from 2015 to 2020.
  - **Aviation:** Currently there is no aviation tax in Poland. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Poland, €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of

[392] European Environment Agency (2012) Monitoring CO_2 emissions from new passenger cars in the EU: summary of data for 2012, Copenhagen.

[393] European Commission (2005) Proposal for a Council directive on passenger car related taxes COM(2005)261 final.

[394] European Environment Agency (2013) Road user charges for HGV – tables with external costs of air pollution, EEA Technical Report 1/2013, Copenhagen.

implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

- **Pollution and Resource Taxes:**
  - **Aggregates:** Extraction of minerals for use as aggregates causes harm to the environment. An aggregates tax helps to reduce the environmental burden by increasing the price of raw materials, and so stimulates the market for recyclable materials. This ultimately reduces costs for businesses, but also is in-line with the flagship initiative 'A Resource Efficient Europe.[395] It is suggested that Poland implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this to keep the rate constant in real terms. The types of materials that could be covered by the tax are:
    - Marble;
    - Chalk and dolomite;
    - Slate;
    - Limestone and gypsum;
    - Sand and gravel.

    Not all of these are extracted in Poland. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.
  - **Waste:** Since around 2008, the tax rate has been supporting more recycling of waste. Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Further increases in the Polish waste tax would help drive the change in the waste management sector needed to meet EU targets in 2020 and give support to the application of the waste hierarchy. It is suggested that tax rates are increased to €50 per tonne by 2017. Part of the revenues could accrue to national budget.
  - **Packaging:** Poland has an ad-valorem tax for plastic packaging with rates ranging from 10-20%. Still, there are environmental burdens associated with other types of packaging. A small number of Member States have implemented packaging taxes for packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied to all packaging placed on the market in Poland:
    - Aluminium €197 per tonne
    - Plastic €64 per tonne
    - Steel €54 per tonne

[395] European Commission (2011) Roadmap to a Resource Efficient Europe, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax**: There is currently no tax on single-use plastic bags in Poland. Plastic bags cause many environmental problems when littered in the environment, especially when then end up in the marine environment. Taxing single-use plastic bags significantly influences consumers purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[396] Therefore, it is suggested that Poland implements a tax on single-use plastic bags at a rate of €0.06 per bag from 2016, and following this, keeps the rate constant in real terms.
- **Air pollution:** It is suggested that in order to generate improvements in air quality the tax rates are adjusted as follows:
  - NOx/VOC €1,000 per tonne
  - SOx €1,000 per tonne
  - PM2.5 €2,000 per tonne

  Given the magnitude of the change in tax rates it is suggested that there is a transition period from 2015 to maximum levels by 2020. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.
- **Water abstraction:** To improve efficiency in the usage of the water supply system, in particular the high leakage rates, it is suggested to adjust tax rates in-line with 'good practice'. With relative price levels in Poland this would imply rates of €155 per 1,000 m^3 for the public water supply, €95 per 1,000 m^3 for manufacturing purposes and €13 per 1,000 m^3 for agriculture. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.
- **Waste water:** Poland has a levy on water pollution. To improve prevention of water pollution and reflect better the environmental burdens it is suggested to adjust tax rates in-line with 'good practice'. With relative price levels in Poland this would imply a rate of €1.3 per kg BOD. For fresh-water discharges also

[396] DG Environment (2013) Proposal to Reduce Plastic Bag Consumption, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

phosphorus should be charged, while for coastal discharges a charge on nitrogen could be relevant. A transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.

- **Pesticides:** There is currently no tax on pesticides in Poland. Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".*

  Poland published its National Pesticide Action Plan in May 2013.[397] The Plan recognises the need to protect the environment and human health, and defines indicators to assess risks associated with pesticide use. Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Poland. It is suggested that Poland implements a pesticides tax at a rate of €5 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate is kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark), could be linked to the risk indicators to be developed under the National Pesticide Action Plan.

- **Fertilisers**: A tax on the use of nitrogen in mineral fertilisers is suggested at a rate of 0.10 €/kgN from 2016. This tax rate would reflect relative price levels for Poland relevant to EU schemes under the CAP, and support the prevention of groundwater contamination, ammonia evaporation, emissions of greenhouse gases and surface water eutrophication.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies are listed in Table 44, and are described further below.

[397] Minister of Agriculture and Rural Development (2013) National Action Plan to Reduce the Risk Associated with the Use of Plant Protection Products, 6 May 2013, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_poland_en.pdf

Table 68: Some Environmentally Harmful Subsidies (Poland)

Subsidy	Amount involved (PLN million, real 2013 terms)
ENERGY	
Investment aid for coal industry infrastructure	<406
Reduced rate for motor fuels used in agriculture, horticulture, forestry, and aquaculture	731
Total	<1,137
Sources: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, pp. 287 - 298, 2012, dx.doi.org/10.1787/9789264187610-en *Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf* Taxation papers, Bruxelles: European Commission DG TAXUD.	

In addition to the above, the following comments can be made:

- **Pollution and resources**
  - The user charges for water supply and sewage appear from data in Eurostat's Household Budget Survey to be fairly low in Poland: €19 per capita per annum for water supply and €17 per capita per annum for sewerage. On the other hand Poland has received considerable amounts of foreign environmental aid for its water sector during the 1990's relieving it from certain costs. The most recent OECD review[398] observed that there is not full-cost recovery for capital costs in many municipalities. It is suggested that good data on 'the full costs' need to be established according to art 9 of WFD, to provide indications of the extent and practice of full-cost pricing. This comment should be considered alongside the suggestion for a tax on waste abstraction and discharge to waste waters made above.

15.2.3 Summary of Revenue Outcomes

Table 69 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change

[398] OECD (2003) Environmental performance review: Poland, Paris, p. 64.

in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 69: Potential Additional Revenue from Environmental Fiscal Reform in Poland, million PLN (real 2013 terms)[399]

Type	2016	2020	2025
Energy			
Transport fuels	649	3,148	4,945
C&I / Heating	1,086	3,105	3,153
Electricity	0	0	0
Sub-total Energy, million PLN	1,735	6,253	8,098
Sub-total Energy, % GDP	0.10%	0.32%	0.36%
Transport (excl. transport fuels)			
Vehicle Taxes	1,518	8,510	9,817
Passenger Aviation Tax	1,351	2,887	3,215
Freight Aviation Tax	0.22	0.50	0.60
Sub-total Transport, million PLN	2,869	11,398	13,033
Sub-total Transport, % GDP	0.16%	0.58%	0.57%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	1308	1,779	1,796
Landfill Tax - Inerts (C&D)	2	1	1
Incineration /MBT Tax	378	558	556
Air Pollution Tax	1,501	2,634	2,145
Water Abstraction Tax	554	1,236	1,197
Waste Water Tax	58	81	81

[399] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Pesticides Tax	219	486	591
Aggregates Tax	4,892	3,434	4,178
Packaging Tax	539	536	568
Single Use Bag Tax	1217	263	291
Fertiliser Tax	0.271	0.580	0.673
Sub-total Pollution & Resource, million PLN	10,667	11,009	11,406
Sub-total Pollution & Resources, % GDP	0.61%	0.56%	0.50%
Total Environmental Taxes			
Total, million PLN	15,271	28,660	32,537
Total Increase, % GDP	0.87%	1.45%	1.43%
Total Environmental Harmful Subsidies			
Total, million PLN	1,137	1,137	1,137
Total Increase, % GDP	0.07%	0.07%	0.06%
Total Potential for Environmental Fiscal Reform			
Total, million PLN	**16,408**	**29,797**	**33,674**
Total Increase, % GDP	**0.93%**	**1.52%**	**1.49%**

15.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, PLN 10 billion of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reduced SOx, NOx and PM10 emissions from stationary sources and reductions in the use of natural gas and coal by industry.

Table 70: Monetised Environmental Benefits from Implementation of Taxes, million PLN (real 2013 terms)

Tax Type	2016	2020	2025
Energy	933	2,628	2,748
Transport	200	589	594
Pollution & Resources	2,134	8,725	7,043
Total, million EUR	3,267	11,942	10,385
Total, % GDP	0.19%	0.67%	0.55%

15.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved Poland:[400]

- In 2012 environmental taxes generated revenue equivalent to 2.52% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **PLN 15 billion (€3.7 billion)** in 2016, rising to **PLN 33 billion (€7.8 billion)** in 2025 (both in real 2013 terms). This is equivalent to **0.87%** and **1.4%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be in excess of **PLN 1.1 billion (€0.27 billion)** in 2016 (real 2013 terms), or **0.07%** of GDP.
- The largest revenue stream comes from suggested changes in vehicle taxation. This accounts for **PLN 9.8 billion (€2.4 billion)** by 2025 (real 2013 terms), or **0.34%** of GDP. It was suggested that taxes on transport should be raised through the introduction of a circulation tax with a tax base related to emissions in line with the Commission's 2005 proposal on passenger car taxes.
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **PLN 4.9 billion (€1.2 billion)** of additional revenue by 2025 (real 2013 terms), equivalent to **0.17%** of GDP.
- The suggested tax on the extraction of aggregates in Poland could yield **PLN 4.2 billion (€1 billion)** by 2025 (real 2013 terms), or **0.14%** of GDP.
- A significant amount of revenue could also be gained from the introduction of a tax on passenger flights. Such a tax could yield an estimated **PLN 3.2 billion (€0.8 billion)** by

[400] % GDP calculated using data from Eurostat (2013) GDP and Main Components - Current Prices [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) Real GDP Growth Rate - Volume, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

2025 (real 2013 terms), equivalent to **0.11%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.

- The suggested changes to the excise duties charged for fuels used by businesses for heating could result in **PLN 3.2 billion (€0.8 billion)** of additional revenue in 2025 (real 2013 terms), or **0.11%** of GDP.
- In addition, minor taxes on, *inter alia*, air pollution, the landfilling of non-hazardous residual waste, water abstraction, and pesticides, could generate revenue of **PLN 7.2 billion (€1.7 billion)** by 2025 (real 2013 terms), or **0.25%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **PLN 10 billion (€2.5 billion)** in 2025 (real 2013 terms), or **0.55%** of GDP.
- The 2013 Annual Growth Survey (AGS) identified one key priority, that:
  - *Tax should be designed to be more growth-friendly, for instance by shifting the tax burden away from labour on to tax bases linked to consumption, property, and combatting pollution.* [401]

The above suggestions may contribute to this objective in respect of environmental taxes. Country specific recommendations approved by the Council in 2013 also suggested a need to correct excessive deficits, and improve waste and water management. The measures proposed may also contribute to these aims.

[401] European Commission (2013) *Annual Growth Survey 2014*, COM(2013) 800 Final, http://ec.europa.eu/europe2020/making-it-happen/annual-growth-surveys/index_en.htm, p. 7

16.0 Romania

16.1 Country Overview

16.1.1 Key Facts about the Economy and Tax System

- Romania's economy achieved significant growth in GDP between 2004 and 2008, with an average growth of 6.8% per annum in real terms.[402]
- GDP fell by 6.6% in real terms in 2009 as a result of the financial crisis, a greater fall than the average in the EU-28 (a drop of 5.8% in real terms) in the same year. Following a further year of decline in GDP of 1.1% in real terms in 2010, a return to growth occurred in 2011.[403]
- Romania's overall tax revenue (including social contributions) is comparatively low, at 28% of GDP (in 2012). The proportion has remained relatively constant over recent years, and the average level since 2001 is also 28% of GDP.[404]
- Romania's tax base relies heavily on income from indirect taxes accounting for 47% of the total tax take in 2012.[405] This high rate is partly attributable to hikes in excise duty rates in 2009 and in the VAT standard rate in 2010.[406] Social contributions comprised 32% of total taxes, whilst direct taxes comprised 22% of the total tax revenue in 2012.
- In 2012, the share of environmental tax revenue as a proportion of GDP was 1.94%. This has fallen from a level of 2.37% of GDP in 2004. The share of revenue from environmental taxes was lowest in 2008 when it stood at 1.78% of GDP.[407]
- Energy taxes provide the majority of revenue from environmental taxes in Romania, at 1.72% of GDP in 2012. Transport taxes (excl. transport fuels) comprised 0.16% of GDP, whilst revenue from taxes on pollution and resources amounted to just 0.06% of GDP.[408]
- Income from energy taxes peaked at 2.15% of GDP in 2004. Contributions from transport taxes (excl. transport fuels) stayed relatively constant between 2001 and 2005 (at an average of 0.07% of GDP) before increasing significantly, reaching 0.36% of GDP in 2008, after which, the share of GDP steadily declined. Pollution and resource taxes, as

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[402] Eurostat (2013) *Real GDP Growth Rate – Volume,* Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[403] Eurostat (2013) *Real GDP Growth Rate – Volume,* 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[404] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

[405] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

[406] European Commission (2013) *Taxation trends in the European Union*, 2013

[407] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

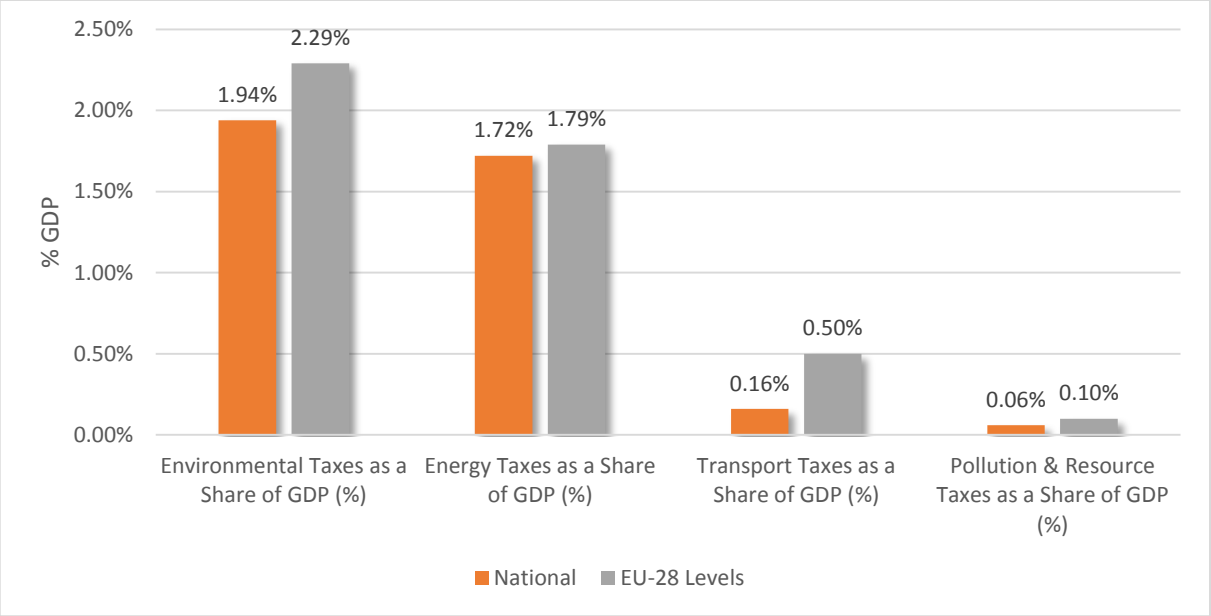
[408] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

a percentage of GDP, have fallen steeply between 2001 and 2011, dropping from 0.36% of GDP to 0.01% of GDP in 2011, before increasing to 0.06% of GDP in 2012.[409]

16.1.2 Relative Position within the EU

- In 2012, expressed as a percentage of GDP revenue from environmental taxes was well below the level for the EU-28 at 1.94% GDP. Energy taxation was just below the EU-28 level of 1.79% of GDP. Revenue from transport taxes (excl. transport fuels) was just under a third of the EU-28 level of 0.50% of GDP, whilst taxes on pollution and resources were far below the EU-28 level of 0.10% of GDP (see Figure 11).[410]

Figure 11: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

- As a share of GDP, environmental tax revenues in Romania ranked 24th in the EU-28 in 2012. Revenue from energy taxation ranked 19th in 2012. Taxes on transport (excl. transport fuels) ranked 24th. Taxes on pollution and resources also ranked 15th (see Table 17).[411]

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[409] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[410] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[411] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Table 71: Ranking of Country Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	24
Energy Taxes as a Share of GDP (%)	19
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	24
Pollution & Resource Taxes as a Share of GDP (%)	15

Source: based on Eurostat data

16.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax are given in the Appendix. This section summarises key aspects of the main environmental taxes, and describes how the rates compare with European averages and for energy with the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[412,413]

- **Energy:** The Romanian excise duties on fuels and electricity are shown in Table 72, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

Table 72: Standard Rates of Excise Duties on Fuels and Electricity in Romania

Excise Duty	Unit	Rate Applied in Romania[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	per 1,000 litres	RON 1,905 (€431)	€421	€580	€583
Unleaded Petrol	per 1,000 litres	RON 1,626 (€368)	€359	€536	€515
Gas Oil (Diesel)	per 1,000 litres	RON 1,494 (€338)	€330	€425	€412
Kerosene	per 1,000 litres	RON 1,700 (€385)	€330	€434	€410
Liquid Petroleum Gas	per 1,000 kg	RON 580 (€131)	€125	€197	€176
Natural Gas	per GJ	RON 12 (€2.66)	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					

[412] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[413] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Romania[1]	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	per 1,000 litres	RON 1,494 (€338)	€21	€233	€242
Kerosene	per 1,000 litres	RON 1,700 (€385)	€21	€300	€330
Liquid Petroleum Gas	per 1,000 kg	RON 580 (€131)	€41	€134	€125
Natural Gas	per GJ	RON 12 (€2.66)	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	per 1,000 litres	RON 1494 (€338)	€21	€178	€122
Kerosene	per 1,000 litres	RON 1700 (€385)	€0.00	€265	€330
Heavy Fuel Oil	per 1,000 kg	RON 68 (€15)	€15	€71	€25
Liquid Petroleum Gas	per 1,000 kg	RON 513 (€116)	€0.00	€78	€42
Natural Gas	per GJ	RON 0.77 (€0.17)	€0.15	€1.38	€0.59
Coal and Coke	per GJ	RON 0.68 (€0.15)	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	per 1,000 litres	RON 1494 (€338)	€21	€185	€123
Kerosene	per 1,000 litres	RON 1700 (€385)	€0.00	€275	€330
Heavy Fuel Oil	per 1,000 kg	RON 68 (€15)	€15	€75	€25
Liquid Petroleum Gas	per 1,000 kg	RON 513 (€116)	€0.00	€110	€43
Natural Gas	per GJ	RON 1.45 (€0.33)	€0.30	€2.11	€1.07
Coal and Coke	per GJ	RON 1.36 (€0.31)	€0.30	€1.69	€0.32
Electricity					
Business Use	per MWh	RON 2.26 (€0.51)	€0.50	€10.23	€1.21
Non-Business Use	per MWh	RON 4.52 (€1.02)	€1.00	€14.68	€1.91

Note:

4. *The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013)* ECU/ECR Exchange Rates versus National Currencies, *Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12.*

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- Tax rates on motor fuels used as propellant are set just above the existing ETD minimum levels, and below EU average and median levels. The opposite is true for rates on motor fuel use for industry and commercial use, where rates surpass EU averages and median levels.
- In 2012 this tax generated revenue of RON 10.12 billion (€2.27 billion), equivalent to 1.64% of GDP.[414]

➢ **Transport (excl. transport fuels):**

- In Romania a vehicle registration fee (or 'environmental stamp duty') is paid upon the first registration of a vehicle. The tax is based upon a formula that takes into account factors such as CO_2 emissions and vehicle age. The rate of tax is reduced according to the age of the vehicle; no reductions are in place for new vehicles, but cars older than 15 years may receive a reduction of up to 95%. In 2013 this tax generated revenue of RON 365 million (€81 million), equivalent to 0.057% of GDP.
- In addition to the one-off registration fee, there is also an annual circulation fee charged on motor vehicles, heavy vehicles, trailers, boats and other forms of water transport. The motor vehicle circulation fee is based upon a motor vehicle's cylinder capacity and is paid by owners of mopeds, scooters, motorcycles, cars, buses, coaches and minibuses. The heavy goods vehicle circulation fee is based on the number of axles, vehicle tonnage, and the type of suspension. Trailers are charged based on weight, and boats and other forms of water transport are charged based both on weight and engine capacity (see Appendix for more details). The above circulation taxes generated RON 949 million (€224 million) of revenue in 2011, equivalent to 0.17% of GDP.

➢ **Pollution and resources:**

- A tax on the exploitation of natural resources was approved by the Romania government in January 2013 as part of Government Ordinance no. 6/2013 (subsequently amended in October 2013 under Government Ordinance 262/2013). Under this law all revenues from the exploitation of natural resources, other than gas, are taxed at a rate of 0.5% (companies are also required to pay the tax on resources which had been exploited prior to 1st February 2013, but had not yet been sold). The tax will be in place until the 31st December 2014. The tax applies to the production and/or processing of crude oil, superior quality coal, low quality coal, uranium, thorium and other extractive activities. Revenues derived from the tax are reportedly meant for co-financing 'ongoing investment projects', although no specific projects or sectors have been named. Given the recent introduction of this tax there is currently no precise figure on the revenue derived from it.
- At the same time as the above tax was announced Romania's Finance Ministry announced a surcharge of 60% on excess revenues received as a result of

[414] DG TAXUD (2013) *Excise Duty Tables (Tax receipts – Energy products and Electricity)*, July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

deregulation of the natural gas market (originally announced in Government Ordinance no. 7/2013). This tax was introduced on the 1st February 2013 and as with the tax on natural resources will be in place until the 31st December 2014.

- A landfill tax was due to come into effect for inert and non-hazardous waste at a level of RON 50 (€11) per tonne in 2014, RON 80 (€18) per tonne in 2015 and RON 120 (€27) per tonne thereafter. The application of landfill taxes across the EU is varied. However, a number of Member States have, or have had, high landfill taxes for active wastes. There is some variation in the way 'inert' wastes are taxed, with some countries taxing these at lower rates than for municipal type wastes, but others applying the same taxes as for other non-hazardous wastes.
- There is an air pollution fee with rates charged per tonne of pollutant emitted into the atmosphere from stationary sources. Taxes are applied to the following pollutants: nitrogen oxides, persistent organic pollutants, sulphur oxides, dust and heavy metals including cadmium, lead and mercury. All revenues from this tax are paid to Romania's Administration of Environment Fund and in 2013 revenues amounted to RON 13 million (€2.9 million), equivalent to 0.002% of GDP. For common pollutants, such as NOx, SOx and PM, the rates are very low (of the order €10 per tonne). Although several Member States apply no such tax, in those that do, rates of the order €1,000 per tonne are already applied in some cases.
- A water abstraction fee is applied in Romania with differentiated rates being applied depending on the use of the water and whether the extraction is from surface water or groundwater sources. The highest rate of extraction is RON 58 (€13) per 1,000m^3. The revenue generated from this fee is paid to Romania's National Water Administration and is used to finance and maintain the country's flood defence systems.
- Romania has a water pollution fee with rates charged upon the discharge of one tonne of different pollutants. Arsenic and cyanides are taxed at the highest rate of RON 36,196 (€8,191) per tonne. Income derived from these fees is also paid to the National Water Administration.
- A tax on packaging is in place at RON 2 (€0.44) per kilogram. This is payable by economic operators placing packaged goods on the national market, but only in the event that the economic operator fails to meet the official annual target for packaging waste recovery. Consequently, only limited revenue is generated, the figure being RON 52 million (€11.54 million) in 2013, equivalent to 0.008% of GDP.
- A tax on plastic bags is charged at a rate of RON 0.1 (€0.023) per bag with handles. This tax generated revenue of RON 22 million (€4.86 million) in 2013, equivalent to 0.0034% of GDP.
- There are other environmental fees or charges in Romania on the storage or sale of scrap metal, waste storage, tyres, waste oil, timber and dangerous substances.
- Pollution and resource taxes in Romania are not linked to an inflationary index. Instead, all taxes and fees are updated by special ordinances issued by the Romanian Government and endorsed by the Parliament. There is no specific

schedule for these updates which tend to be introduced at varying times depending on the tax and/or charge.

- A number of environmentally harmful subsidies have been identified as part of work undertaken by IEEP and IVM, and from Excise Duty Tables.[415,416,417] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 16.2.2 (all subsidies are detailed in Appendix A.8.4). The main subsidies can be summarised as follows:
  - Excise tax exemptions on kerosene, LPG, natural gas and coal and coke used for heating (non-business);
  - Excise tax exemptions on fuels used for domestic shipping and aviation, and fuel subsidies for railways.

16.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Romania. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes. Outturns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

16.2.1 Current Status of EFR

Many environmental taxes in Romania are administered by the Administration of Environment Fund (AEF), which was created in 2005 by the Emergency Ordinance 196 issued on December 22, later endorsed by Law 105/2006, which was amended in 2010 by Emergency Ordinance 15/February 23, 2010, further endorsed by Law 167/July 14, 2010. AEF is a juridical entity subordinated to the Ministry of Environment which collects taxes on pollution and the exploitation of natural resources. Funds collected by AEF are used to finance projects designed to address environmental concerns, such as the 'clunker program' (i.e. car scrapping scheme) which provides vouchers for the purchase of new vehicles when old cars are scrapped.[418]

In addition, in 2008, the 'environment stamp duty' on vehicles (see above) was introduced in order to deter people from using more polluting vehicles. This was set out in the Emergency Ordinance 50/April 21, 2008, later endorsed by the law 140/2011. Further developments in Romania have been summarised by the European Commission:

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[415] See *Table 5 in IEEP (2013) Steps to Greening Country Report: Romania, Report for the European Commission, p.10.*

[416] IVM Institute for Environmental Studies (2013) *Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries*, Final Report, 15 January 2013, pp.51-58. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

[417] *DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

[418] IHS Global Insight (2010) *Assessment of the Effectiveness of Scrapping Schemes for Vehicles: Economic, Environmental, and Safety Impacts*, Report for March 2010, Report for DG Enterprise and Industry, www.econbiz.de/Search/Results?lookfor=%22IHS+Global+Insight%22&type=Institution&limit=20

"Several measures to increase the environmental taxes are being prepared. The new pollution tax legislation for cars entered into force in mid-January 2012, but its application has been suspended. More recently a new 'environmental stamp tax' which differentiates car purchase taxation based on CO_2 emissions was introduced. This is consistent with efforts to tax environment-related negative externalities. In early 2013 Romania also adopted a tax on the exploitation of natural resources other than natural gas and a tax on the surplus revenues gained as a consequence of natural gas price deregulation. A landfill tax is expected to be introduced in 2013".[419]

In terms of the energy market the above cited report states that:

"In 2012, Romania made progress in transposing the third energy package directives. However, transposition of some provisions is still outstanding, including those relating to the protection of vulnerable consumers and certain duties of the energy regulator. To improve market efficiency, Romania has committed to a roadmap for the liberalisation of gas and electricity prices that is to be completed by the end of 2017 for gas and by the end of 2018 for electricity".[420]

Romania has a history of state involvement in the energy sector. The first significant privatisation contract in the energy market was signed in 2004 and a number of contracts have been signed since. However, the energy sector *"is still heavily influenced by state involvement in financial instruments, even if the general trend is towards the liberalization of the market"*.[421] Although subsides on hard-coal should have been phased out in Europe by 2011, Romania's current energy policy is aiming to have these subsidies removed by 2018.[422] The country has a number of other EHS in place on energy products and with the liberalisation of the market it is likely that a number of these may be addressed over time.

It is worthy of note that the 2013 European semester included the following country-specific recommendation for Romania:

Ensure growth-friendly fiscal consolidation and implement the budgetary strategy for the year 2013 and beyond as envisaged, thus ensuring achievement of the medium term objective by 2015. Improve tax collection by implementing a comprehensive tax compliance strategy and fight undeclared work. <u>In parallel, explore ways to increase reliance on environmental taxes.</u> Equalise the pensionable age for men and women and underpin the pension reform by promoting the employability of older workers.

Romania has taken some measures to increase environmental taxes recently. The above-mentioned "environmental stamp" on vehicles, differentiated by CO_2 emissions, was introduced

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[419] European Commission (2013) *Assessment of the 2013 National Reform Programme and Convergence Programme for Romania*, May 2013, COM(2013) 373 Final, p. 15

[420] European Commission (2013) *Assessment of the 2013 National Reform Programme and Convergence Programme for Romania*, May 2013, COM(2013) 373 Final, p. 25

[421] IVM Institute for Environmental Studies (2013) *Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for Six non-OECD EU Countries*, January 2013, http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf, p. 49

[422] *Ibid.*

through the Emergency Government Ordinance no. 9/2013 of 19 February. Significant scope for further EFR remains, however.

16.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes and 'good practice', the following suggestions are made:

<u>Adjustments to existing taxes or new taxes:</u>

- Energy Taxes:
  - It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO_2 price. Transport fuels are equalised using the energy content on petrol (€9.8/GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€9.4/GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the rate of €1.26/GJ, which is currently applied to LPG.
  - Table 73 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 73: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	368	368
Light fuel oil (diesel)	€/1000 litre	398	338
LPG (propellant)	€/1000 kg	511	131
Kerosene	€/1000 litre	400	385
Natural gas (prop)	€/GJ	11	3
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	382	338
Kerosene	€/1000 litre	385	385
LPG	€/1000 kg	491	131
Natural gas	€/GJ	11	3
BUSINESS HEATING			
Gas oil	€/1000 litre	338	338

	Units	Suggested Rates	Existing Rates
Heavy fuel oil	€/1000 kg	112	15
Kerosene	€/1000 litre	385	385
LPG	€/1000 kg	116	116
Natural gas	€/GJ	2.38	0.17
Coal	€/GJ	3.15	0.15
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	338	338
Heavy fuel oil	€/1000 kg	112	15
Kerosene	€/1000 litre	385	385
LPG	€/1000 kg	116	116
Natural gas	€/GJ	2.38	0.33
Coal	€/GJ	3.15	0.31
ELECTRICITY			
Electricity - business use	€/MWh	1.02	0.51
Electricity - non-business use	€/MWh	1.02	1.02

- Transport Taxes:
  - **Vehicles:** The revenues from taxes on transport in Romania are among the lowest in the EU (0.16% of GDP compared to the EU-28 level of 0.50% GDP). Scope exists for increasing vehicle taxation, both as a means for raising revenue but also for increasing differentiation between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. In line with the proposals from the Commission of 2005, we suggest that the main increase should relate to the existing circulation tax. Unlike the registration tax in Romania, the circulation tax rates on vehicles lack differentiation according to environmental performance (with engine capacity being the determinant of rates) whilst rates applicable to heavy goods vehicles are low, and also have no differentiation related to environmental performance. It is suggested that Romania could readily increase vehicle taxation by 1.0% GDP. This figure is applied to future projections of real GDP in order to calculate revenue potential in future years. The increase is phased in over the period from 2015 to 2020.

- **Aviation:** Currently there is no aviation tax in Romania. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Romania, €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➢ **Pollution and Resource Taxes:**

- **Waste – landfill tax:** The level of landfill tax applied to non-hazardous waste in Romania is set to rise to RON 120 (€27) per tonne in 2016 (2013 prices) and then remain static. It is currently set at a rate of RON 50 (€11) per tonne. Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Romania has aspirations to become a recycling society. Further increases in the tax would help drive the change in the waste management sector needed to meet EU targets in 2020 and give support to the application of the waste hierarchy. Therefore, it is suggested to increase the rate of landfill tax for non-hazardous wastes to €50 per tonne in 2018 and index rates thereafter so that the tax remains constant in real terms. The existing rate for construction wastes is set at the same rate of €11 per tonne, rising to €27 per tonne in 2016. This is a high rate for such wastes so no change is suggested.
- **Aggregates:** There is currently no permanent tax on aggregates in Romania. An aggregates tax helps reduce extraction rates for aggregates, and stimulates the market for the use of secondary materials. The instrument works well alongside taxes for landfilling of construction and demolition wastes. This approach is aligned with the Roadmap to A Resource Efficient Europe.[423] It is suggested that Romania implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this, keeps the rate constant in real terms (either through annual changes, or periodic increases). The types of materials that could be covered by the tax are:
    - Marble
    - Chalk and dolomite

[423] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

- Slate
- Limestone and gypsum
- Sand and gravel

Not all of these are extracted in Romania. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste – incineration / MBT tax:** In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne over the same period as the landfill tax is increased (i.e. up to 2018). An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe. [424]
- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. Romania currently has in place a packaging tax of RON 2 (€0.44) per kilogram of packaging, but this is only charged if packaging recycling targets are missed. It is suggested that the following rates could be applied to all packaging placed on the market in Romania (by 2016):
  - Aluminium €197 per tonne
  - Plastic €64 per tonne
  - Steel €54 per tonne
  - Paper and card €20 per tonne
  - Glass €18 per tonne
  - Wood €13 per tonne

  These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.
- **Single-use carrier bag tax**: Plastic bags are currently taxed at a rate of RON 0.1 (€0.023) per bag with handles. Plastic bags cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the marine environment. As such, marine litter is specifically mentioned

[424] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

as a pressure in the Marine Strategy Framework Directive (2008/56/EC).[425] A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[426] Therefore, it is suggested that Romania increases the tax on single-use plastic bags to a rate of €0.05 per bag from 2016, and following this to keep the rate constant in real terms.

- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. Eurostat data indicates that 97% of the urban population in Romania was exposed to PM_{10} concentrations exceeding the daily limit value of 50 µg per m^3 for over 35 days in 2011 (the latest year for which data is available).[427] The 'safe' limit is no more than 35 days exposure per year at greater than 50 µg per m^3, so the majority of Romania's urban areas are above this threshold.[428] Due to a high number of excedences over a number of years leading up to 2011, the European Commission provided Romania with a written warning in April 2011.[429] Romania has a system of air pollution taxes in place, but these are generally set at very low rates; it is suggested that the planned rates could be increased further to generate additional incentives for abatement, and hence, improvements in air quality. The suggested tax rates are as follows:
    - SOx €1,000 per tonne
    - NOx €1,000 per tonne
    - PM10 €2,000 per tonne

  Given the magnitude of the increase in rates, a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to

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[425] DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF

[426] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[427] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

[428] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

[429] European Commission (2011) *Environment: Commission Takes Belgium to Court and Warns Romania over Failure to Comply with EU Air Quality Rules*, Published 4th April 2011, Accessed 21st January 2014, http://europa.eu/rapid/press-release_IP-11-435_en.htm?locale=en

maximum levels. The rates are then held constant in real terms. These may also assist in ensuring that stationary sources meet proposed BAT AELs under the Industrial Emissions Directive.

- **Water abstraction:** A central theme of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*. Romania already has a water abstraction fee in place, but the extent to which it covers all relevant costs is unclear. It suggested that existing rates are increased so as to help improve efficiency in the usage of water. Moreover, the water exploitation index, reported by Eurostat, indicates Romania is close to problematic levels of water abstraction.[430] It is suggested that rates rise to levels of €65 per 1,000 m^3 for the public water supply, €40 per 1,000 m^3 for manufacturing purposes and €6 per 1,000 m^3 for agriculture. Given the magnitude of the suggested increase in rates, a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. The rates should then be held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[431] Romania's charge on discharge of BOD, for example, is at €0.01 per kg. To improve prevention of water pollution it is suggested to adjust tax rates in-line with 'good practice'. With relative price levels in Romania this would imply a rate of €1.09 (RON 4.9) per kg BOD. For fresh-water discharges also phosphorus should be charged, while for coastal discharges a charge on nitrogen could be relevant. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2020 levels. Part of the revenues could accrue to national budget.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

> *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified*

[430] Eurostat (2014) *Resource Efficiency Scoreboard: Water Exploitation Index %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=t2020_rd200&tableSelection=1

[431] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets".

Romania recently published its National Pesticide Action Plan (September 2013).[432] Although objective reduction targets have not been set, the Plan recognises the need to protect the environment and human health. Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Romania. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €5 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would support progress towards the objectives set out in the National Pesticide Action Plan.

- **Fertilisers**: Romania does not currently implement a tax on nitrogen (or other) fertilisers. The Commission's report on the Implementation of Council Directive 91/676/EEC states that: *"As compared to 2008, the total area in the EU designated as [a nitrate] vulnerable zone has increased, with particular increases in Romania, Belgium-Wallonia, Spain, Sweden, and the United Kingdom"*.[433] It is therefore suggested that a tax on the use of non-organic nitrogen in fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.10 per kilogram of nitrogen be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been calculated as part of this study, or previous studies, are listed in Table 32. Further details of our calculation methodology are available in Appendix A.8.4, in which we also present a full list of subsidies for which no figures for forgone revenues are available.

[432] Government of Romania (2013) *Decision Approving the National Action Plan for Mitigating the Risks Related to the Use of Plant Protection Products*, Official Gazette of Romania, Part I, No 585/16 September 2013, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_romania_en.pdf

[433] European Commission (2013) Report from the Commission to the Council and the European Parliament on the Implementation of Council Directive 91/676/EEC Concerning the Protection of Waters Against Pollution Caused by Nitrates from Agricultural Sources Based on Member State Reports for the Period 2008–2011, p. 8

Table 74: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (RON million, real 2013 terms)
ENERGY	
Excise tax exemption for kerosene used for heating (non-business)	0[1]
Excise tax exemption for LPG used for heating (non-business)	96[1]
Excise tax exemption for natural gas used for heating (non-business)	147[1]
Excise tax exemption for coal and coke used for heating (non-business)	35[1]
Excise tax exemption for fuels used for internal waterway transportation	86[1]
Fuel subsidies for railways	309[2] - 326[1]
Fossil fuel subsidy for agricultural use (reduced diesel excise for agricultural purposes)	14.2[3]
Fuel tax refund for agriculture	4.4[2]
POLLUTION & RESOURCES	
National uranium company	34.5[3]
Total	726 –743

Notes:

1) *Calculated based on exemption description in: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#*

2) *Amount involved stated in: IVM Institute for Environmental Studies (2013) Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries, Final Report, 15 January 2013, pp.51-58. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf*

3) *Amount involved stated in: Table 5 in IEEP (2013) Steps to Greening Country Report: Romania, Report for the European Commission, p.10.*

16.2.3 Summary of Revenue Outcomes

Table 75below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 75: Potential Additional Revenue from Environmental Fiscal Reform in Romania, million RON (real 2013 terms)[434]

Type	2016	2020	2025
Energy Taxes			
Transport fuels	130	639	1,012
C&I / Heating	529	2,510	3,877
Electricity	49	49	49
Sub-total Energy, million RON	708	3,198	4,939
Sub-total Energy, % GDP	0.10%	0.43%	0.59%
Transport Taxes (excl. transport fuels)			
Vehicle Taxes	1402	7,694	8,663
Passenger Aviation Tax	571	1,188	1,286
Freight Aviation Tax	0.06	0.10	0.09
Sub-total Transport, million RON	1,973	8,882	9,948
Sub-total Transport, % GDP	0.29%	1.19%	1.19%
Pollution and Resource Taxes			
Landfill Tax - Non-haz (excl. C&D)	0	1,475	1,516
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	5	16	26
Air Pollution Tax	765	1,353	1,110
Water Abstraction Tax	149	321	313
Waste Water Tax	260	363	363
Pesticides Tax	54	107	114
Aggregates Tax	3,353	2,118	2,258
Packaging Tax	154	143	142

[434] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Single Use Bag Tax	1293	263	293
Fertiliser Tax	0.073	0.149	0.163
Sub-total Pollution & Resource, million RON	6,033	6,159	6,134
Sub-total Pollution & Resources, % GDP	0.89%	0.83%	0.73%
Total Environmental Taxes			
Total, million RON	8,714	18,239	21,021
Total Increase, % GDP	1.29%	2.45%	2.51%
Total Environmental Harmful Subsidies			
Total, million RON	734	734	734
Total Increase, % GDP	0.11%	0.11%	0.11%
Total Potential for Environmental Fiscal Reform			
Total, million RON	**9,448**	**18,973**	**21,755**
Total Increase, % GDP	**1.40%**	**2.56%**	**2.62%**

16.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, RON 2.9 billion of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reduced emissions of air pollutants, a significant increase in the tax rate for coal use for heating, and the resultant fall in demand for coal, reduced electricity consumption and reduced landfilling.

Table 76: Monetised Environmental Benefits from Implementation of Taxes, million RON (real 2013 terms)

Tax Type	2016	2020	2025
Energy	797	990	1,113
Transport	56	163	164
Pollution & Resources	338	1,890	1,672
Total, RON million	1,191	3,043	2,949
Total, % GDP	0.18%	0.44%	0.40%

16.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Romania:[435]

- In 2012 environmental taxes generated revenue equivalent to 1.94% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **RON 8.7 billion (€1.9 billion)** in 2016, rising to **RON 21 billion (€4.7 billion)** in 2025 (both in real 2013 terms). This is equivalent to **1.3%** and **2.5%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be in the vicinity of **RON 0.7 billion (€0.17 billion)** in 2016 (real 2013 terms), equivalent to **0.11%** of GDP.
- The largest revenue stream comes from suggested changes in vehicle taxation. This accounts for **RON 8.7 billion (€1.9 billion)** by 2025 (real 2013 terms), equivalent to **0.76%** of GDP. In line with the proposals from the Commission of 2005, it was suggested that the existing circulation tax should be increased and banded according to the environmental performance the vehicle.
- The suggested changes to the duties charged for fuels used by businesses for heating could result in **RON 3.9 billion (€0.9 billion)** of additional revenue in 2025 (real 2013 terms), equivalent to **0.34%** of GDP.
- A tax on the extraction of aggregates in Romania could yield **RON 2.3 billion (€0.51 billion)** in 2025 (real 2013 terms), equivalent to **0.2%** of GDP.

[435] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

- The suggested increase in the existing rate of landfill tax could yield an additional **RON 1.5 billion (€0.34 billion)** in revenue by 2025 (real 2013 terms), equivalent to **0.13%** of GDP.
- A substantial amount of revenue could also be gained from the introduction of a tax on passenger flights. Such a tax could yield an estimated **RON 1.3 billion (€0.29 billion)** by 2025 (real 2013 terms), equivalent to **0.11%** of GDP. Such a tax may be superseded by an alternative instrument in future. That instrument might, if it involves auctioning of allowances, be expected to generate a revenue stream in its own right. It is possible, therefore, that the revenue from the tax is simply replaced (to a greater or lesser degree) by revenue from the new instrument.
- In addition, minor taxes on, *inter alia*, air pollution, the discharge of waste water, water abstraction, and single use plastic bags, could generate additional revenue of **RON 3.5 billion (€0.8 billion)** by 2025 (real 2013 terms), equivalent to **0.31%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **RON 2.9 billion (€0.66 billion)** in 2025 (real 2013 terms), or **0.4%** of GDP.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following
    - *Improve tax collection by implementing a comprehensive tax compliance strategy and fight undeclared work. In parallel, explore ways to increase reliance on environmental taxes.*

  The above suggestions are proposed as ways to increase reliance on environmental taxes in line with the above recommendation.

17.0 Slovakia

17.1 Country Overview

17.1.1 Key Facts about the Economy and Tax System

- Slovakia experienced significant economic growth between 2004 and 2008, with GDP increasing at an average rate of 7.3% per annum in real terms. The recession led to a real terms fall in GDP of 4.9% between 2008 and 2009. Economic growth resumed thereafter, but at a reduced rate compared to pre-recession levels (GDP grew at an average rate of 3.1% per annum in real terms between 2009 and 2012).[436]
- Slovakia's overall tax revenue (including social contributions) relative to GDP has been steadily declining since the beginning of the century. In 2001, tax revenues amounted to 33% of GDP, and then fell to 29% of GDP in 2011, the latest year for which data is available.[437]
- In 2012, the largest proportion of Slovakia's tax revenue came from social security contributions (44% of total tax revenue). Indirect taxes also form a significant proportion of total taxation (37%). The share of direct taxes (19%) has fallen around three and a half percentage points since 2001.
- In 2012, environmental taxes amounted to 1.75% of GDP. Between 2001 and 2004, environmental tax revenues increased from 2.0% to 2.5% of GDP, but since 2004, there has been a steady decline to the current level.[438]
- The largest proportion of environmentally-related taxation in 2012 was from energy taxes, which generated revenue equivalent to 1.52% of GDP. Taxes on transport (excl. transport fuels) accounted for 0.19% of GDP, whilst taxes on pollution and resources accounted for just 0.03% of GDP.[439]
- The proportion of total environmental tax revenues related to energy taxes has been falling gradually in recent years, from 90% in 2004 to 87% in 2012, the latest year for which data is available.[440]

17.1.2 Relative Position within the EU

Slovakia's position relative to the EU-28 is summarised in Figure 12 and Table 77 below:

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[436] Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

[437] Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

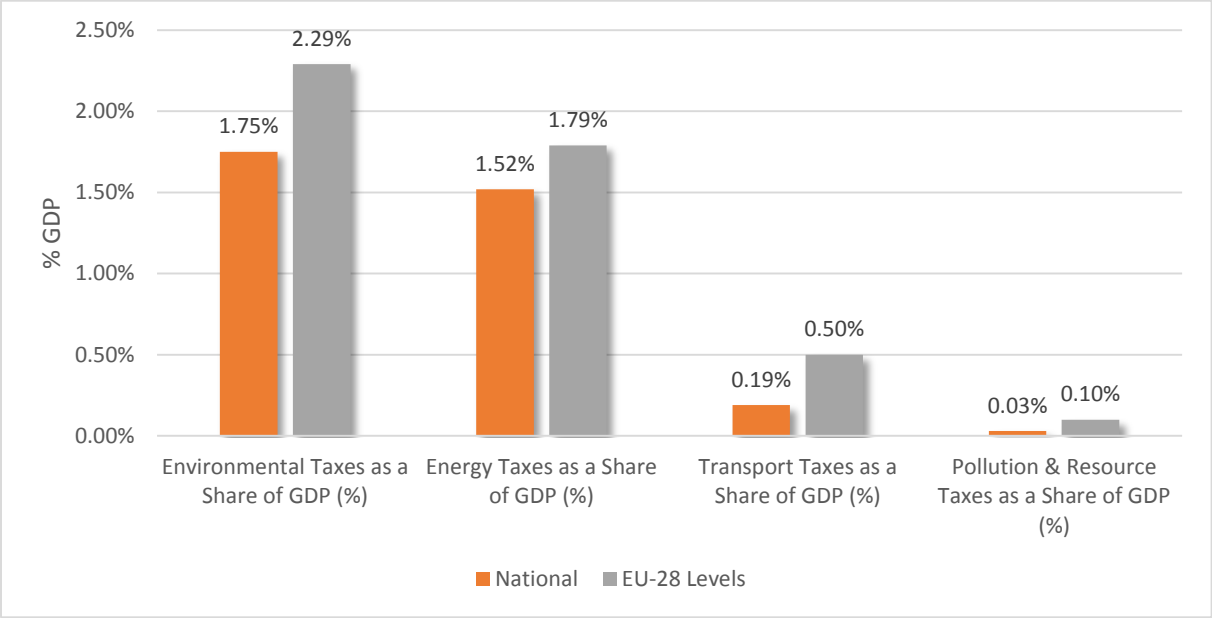
[438] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[439] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[440] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

- In 2012, revenue from environmental taxation – as a proportion of GDP – was well below the EU-28 level of 2.29%. Energy taxation – as a proportion of GDP – was slightly lower than the EU-28 level of 1.52%. By the same measure, revenue from transport taxes (excl. transport fuels) and pollution/resources taxes in Slovakia were both well below the EU-28 levels for 2012 (see Figure 12).[441]

Figure 12: Environmental Taxes as a % of GDP vs EU-28 Levels, 2012



Source: Eurostat data

- As a proportion of GDP, revenue from environmental taxes in Slovakia ranked 24th in the EU-28 in 2011. Energy taxation ranked 23rd out of the EU-28. Taxes on transport (excl. transport fuels) ranked 22nd, whilst taxes on pollution and resources ranked 17th (see Table 77).[442]

[441] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

[442] Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 20th January 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

Table 77: Ranking of Country Position in EU-28, 2011

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	26
Energy Taxes as a Share of GDP (%)	24
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	22
Pollution & Resource Taxes as a Share of GDP (%)	19

Source: based on Eurostat data

17.1.3 Existing Environmental Taxes, Charges and Harmful Subsidies

The full structure and rates for each tax are given in the Appendix (a full list of references for all of the data sources provided in this section are included within this Appendix). This section summarises key aspects of the main environmental taxes, and describes, for energy, how the rates compare with European averages, and with the minimum rates set out in the existing Energy Tax Directive (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.[443,444]

- **Energy:** The Slovakian excise duties on fuels and electricity are shown in Table 78, alongside the minimum rates in the existing ETD and the EU-28 average and median rates.

Table 78: Standard Rates of Excise Duties on Fuels and Electricity in Slovakia

Excise Duty	Unit	Rate Applied in Slovakia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	-	€421	€580	€583
Unleaded Petrol	€ per 1000 litres	€550.52[1]	€359	€536	€515
Gas Oil (Diesel)	€ per 1000 litres	€386.40[2]	€330	€425	€412
Kerosene	€ per 1000 litres	€481.31	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	€182.00	€125	€197	€176
Natural Gas	€ per GJ	€2.60	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					

[443] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[444] Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Excise Duty	Unit	Rate Applied in Slovakia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	€ per 1000 litres	€386.40[2]	€21	€233	€242
Kerosene	€ per 1000 litres	€481.31	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	€182.00	€41	€134	€125
Natural Gas	€ per GJ	€2.60	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€386.40[2]	€21	€178	€122
Kerosene	€ per 1000 litres	€481.31	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	€111.50	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	€0	€0.00	€78	€42
Natural Gas	€ per GJ	€0.37	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€0.31	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€386.40[2]	€21	€185	€123
Kerosene	€ per 1000 litres	€481.31	€0.00	€275	€330
Heavy Fuel Oil	€ per 1000 kg	€111.50	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	€0	€0.00	€110	€43
Natural Gas	€ per GJ	€0.37	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€0	€0.30	€1.69	€0.32
Electricity					
Business Use	€ per MWh	€1.32	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	€0	€1.00	€14.68	€1.91

Notes:

1. This rate is for a biofuel content less than 3.3% for the year 2013. The rate is €514.50 for a minimum biofuel content of 3.3% or more for the year 2013.

2. This rate is for a biodiesel content less than 5.4% for the year 2013. The rate is €368.00 for a minimum biodiesel content of 5.4% or more for the year 2013.

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- In Slovakia, for many fuels, the rate is the same across different uses (e.g. gas oil and kerosene). As a result, rates for these fuels for some uses are far in excess of the minimum rates in the existing Energy Tax Directive, and generally higher than the EU-28 average and median figures. Conversely, tax rates for gas for heating uses, coal and coke, and electricity are lower than the EU-28 average figures.
- A number of exemptions exist for some uses of liquid petroleum gas, coal and coke, and electricity. For these latter two fuels, household use is exempt from tax.
- Revenues in 2012 from fuel excise duties were:
  - Mineral oil duties: €1,071 million, equivalent to 1.5% of GDP.
  - Natural gas duties: €21 million, equivalent to 0.031% of GDP.
  - Coal and coke duties: €0.59 million, equivalent to 0.0009% of GDP.
  - Electricity duties: €16 million, equivalent to 0.023% of GDP.

➢ **Transport (excl. transport fuels):**

- Vehicle circulation tax applies to all individuals or legal entities that use a motor vehicle and a towed vehicle for business activities. The tax rate structure is set by each regional authority, the precise tax rate for each vehicle being related to the engine cylinder capacity (for personal vehicles) or the total weight and axle numbers (for utility vehicles and buses). Revenues in 2011 amounted to €131 million, equivalent to 0.19% of GDP.
- A vignette is in place for all vehicles using motorways. For vehicles heavier than 3.5 tons, this was replaced by distance-based electronic road toll system in 2010. Toll rates are charged per km and depend on the vehicle type, weight and (in the case of trucks) number of axles, emissions class, and the type of road used.
- Municipalities have the option to charge motor vehicle owners for a permit to enter historical city districts. The tax rate is set individually by each municipality. Tax revenues in 2011 totalled €0.52 million, equivalent to 0.0008% of GDP.

➢ **Pollution and resources:**

- A landfill tax applies for the following waste types: hazardous waste, inert waste, municipal waste, and other waste. Tax rates are currently low compared other EU member states, with a current rate of €9.96 per tonne for residual municipal waste that arises from areas where at least three recyclable fractions are collected for recycling. Where at least five fractions have been sorted out for recycling the tax drops to €4.98 per tonne. The rates for municipal residual waste will remain constant in nominal terms until 2016, after which point they will be indexed at the annual average rate of inflation as defined by Slovakia's Statistical Office (see Appendix for more details). The application of landfill taxes across the EU is varied. However, a number of Member States have, or have had, high landfill taxes for active wastes, with the highest rate for non-hazardous waste currently being €90 per tonne in the UK.
- A tax is levied on air pollution from both large and medium sources, and small sources. Tax rates for large and medium sources are defined in terms of tonnes of material emitted and vary according to the type of pollutant. Although several

Member States apply no such tax, in those that do, rates of the order €1,000 per tonne are already applied.

- There is no fixed tax rate for air pollution from smaller sources. Municipalities determine an annual rate specific to each operator of a small source according to the quantity and type of air pollution emitted.
- Revenue in 2011: €15 million, equivalent to 0.021% of GDP.
- Slovakia has a water pollution fee with the exact tax rate proportionate to the sum of liabilities calculated for each of five pollution indexes: biological oxygen demand, insoluble substances, crude oil substances, dissolved inorganic salts, and alkalinity or acidity.
- Revenue in 2011: €9.11 million, equivalent to 0.013% of GDP.[445]
- Slovakia also has a minor levy on the deposition of waste to sludge basins.

➢ A number of environmentally harmful subsidies have been identified from work undertaken by IEEP and OECD, and from Excise Duty Tables.[446,447,448] Subsidies for which actual or calculated revenues forgone/amounts spent are available are listed in Section 17.2.2 (all subsidies are detailed in Appendix A.6.4). Examples of some of the main subsidies are as follows:

- Electricity produced from domestic coal has been supported by feed-in-tariffs in Slovakia since 2005;
- Subsidies on company cars provided by employers are strongly encouraged by the current tax system. Employers consider company cars as cheap, non-wage compensation.[449]

17.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Slovakia. This is then followed by a summary of proposed changes to existing tax rates and/or proposed applications of new taxes, as well as the basis for how the calculation of revenue generation. Outturns from the model regarding revenue projections are the presented, followed by a summary of the monetised environmental benefits.

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[445] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

[446] See Table 4 in *IEEP (2013) Steps to Greening Country Report: Slovakia*, Report for the European Commission, p.10

[447] OECD (2012) *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013,* 2012, pp.307-314, dx.doi.org/10.1787/9789264187610-en

[448] DG TAXUD (2013) *Excise Duty Tables (Part II – Energy products and Electricity),* Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[449] IEEP (2012) *Study supporting the phasing out of EHS*, October 2012, http://ec.europa.eu/environment/enveco/taxation/pdf/report_phasing_out_env_harmful_subsidies.pdf

17.2.1 Current Status of EFR

The system of environmental taxes and charges in Slovakia has the same roots and a similar development as in the Czech Republic. It consists of two segments - environmental taxes and environmentally related charges and fees. The charges accrue as earmarked revenues to the State Environmental Fund and some regional funds.

The Slovak government has several times discussed the relative insignificancy of environmental taxes within the tax system. Currently, it is apparent that the Slovak tax system contains several taxes stemming from the general European debate around Environmental Fiscal Reform, that is, how countries can be motivated towards less environmentally harmful behavior and more effective utilization of natural resources. Their role in Slovakia is, however, primarily a fiscal one.

The general debate on environmental and energy issues in the EU together with the accession of Slovakia to the EU resulted in the commitment of Slovakia to implement a number of EU tax directives, namely the Directive 2003/96/EC (energy taxation). As a result Slovakia introduced new excise duties on electricity, natural gas and solid fuels in 2008.

Although the implementation of Directive 2003/96/EC is clearly linked to environmental concerns, the Ministry of Finance stated that the Directive was implemented purely to meet EU legislative requirements. Prior to this, Slovakia had only applied energy taxes to mineral oils, which had also mainly fulfilled fiscal goals.

In 2010, Slovakia decreased the excise duty on gas oil for propellant use, leading to negative environmental outcomes. However, in 2011 Slovakia abolished the tax allowance for gas oil used in agriculture, removing an environmentally harmful subsidy. This measure came into force in 2013, partly mitigated via the budget of the Ministry of Agriculture, but is planned to be withdrawn in 2014.

In light of ongoing negotiations on amendments to Directive 2003/96/EC and a number of international recommendations, the Ministry of Finance analyzed the possibilities of introducing carbon taxation to increase the role of environmental taxes in 2012.

The results indicated that introduction of carbon taxation would contribute to higher efficiency and solidarity in the tax system and would motivate citizens towards more environmentally friendly consumption patterns. In 2013, the Council of the EU included the following amongst its recommendations:[450]

> *Step up efforts to make the energy market function better; in particular, to increase the transparency of the tariff-setting mechanism, enhance the accountability of the regulator. Strengthen interconnections with neighbouring countries. Improve energy efficiency in particular in buildings and industry.*

Measures such as revised taxes on energy could assist in meeting the objectives of the above recommendation.

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[450] Council of the EU (2013) Recommendation for a Council Recommendation on Slovakia's 2013 National Reform Programme and Delivering a Council Opinion on Slovakia's Stability Programme for 2012-2016, 10654/1/13, Brussels, 19 June 2013, http://register.consilium.europa.eu/doc/srv?l=EN&t=PDF&gc=true&sc=false&f=ST%2010654%202013%20REV%201

17.2.2 Suggested Reforms to the Tax System

On the basis of the above presentation of taxes, the following suggestions are made:

Adjustments to existing taxes or new taxes:

- Energy Taxes:
  - It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO_2 price. Transport fuels are equalised using the energy content on petrol (€15.4 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€12.1 per GJ). Finally, due to the existing rates for gas oil used for heating being very high relative to coal and gas, the rates are equalised using the minimum rate of €1.24 per GJ for heavy fuel oil. Note that this implies a reduction in the existing rate for kerosene from €481 to €95 per 1,000 litres and for gas oil from €386 to €9 per 1,000 litres, however, for the purposes of this analysis the existing rates have been maintained.
  - Table 79 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR/GJ or not.

Table 79: Existing and New Rates Based upon Proposed Revisions to ETD

	Units	Suggested Rates	Existing Rates
TRANSPORT FUELS			
Motor spirit (petrol)	€/1000 litre	551	551
Light fuel oil (diesel)	€/1000 litre	594	386
LPG (propellant)	€/1000 kg	767	182
Kerosene	€/1000 litre	598	481
Natural gas (prop)	€/GJ	17	3
INDUSTRY AND COMMERCIAL MOTORS			
Gas oil	€/1000 litre	478	386
Kerosene	€/1000 litre	481	481
LPG	€/1000 kg	616	182
Natural gas	€/GJ	13	3
BUSINESS HEATING			

	Units	Suggested Rates	Existing Rates
Gas oil	€/1000 litre	386	386
Heavy fuel oil	€/1000 kg	112	112
Kerosene	€/1000 litre	481	481
LPG	€/1000 kg	115	0
Natural gas	€/GJ	2.36	0.37
Coal	€/GJ	3.13	0.31
NON-BUSINESS HEATING			
Gas oil	€/1000 litre	386	386
Heavy fuel oil	€/1000 kg	112	112
Kerosene	€/1000 litre	481	481
LPG	€/1000 kg	115	0
Natural gas	€/GJ	2.36	0.37
Coal	€/GJ	3.13	0.00
ELECTRICITY			
Electricity - business use	€/MWh	1.32	1.32
Electricity - non-business use	€/MWh	1.32	0.00

- **Transport Taxes:**
  - **Vehicles:** The taxes on transport in Slovakia are significantly lower than average in the EU (0.20% of GDP compared to an average of 0.54% GDP). Scope exists for increasing vehicle taxation, both as a means for raising revenue but also for increasing differentiation between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. It is suggested that Slovakia could readily increase vehicle taxation by 0.6% of GDP. In line with Commission proposals of 2005, it is suggested that the increase should focus on the circulation tax, though the system of road tolls could complement any increases. An increase in the level of circulation tax, accompanied by clear differentiation according to CO_2 emissions and the emissions of particulate matter, could be introduced with this in mind. This figure is applied to future projections of GDP in order to calculate revenue potential in future years. The increase is phased in over the period from 2015 to 2020.
  - **Aviation:** Currently there is no aviation tax in Slovakia. Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector.

This might not, however, be implemented until 2020. Therefore it is suggested to implement an aviation tax on air passenger flights and on air freight. It would be expected that such a tax would be banded according to distance travelled. For the purposes of estimating the order of magnitude of revenues that might be generated by such a tax, we have applied rates of €15 per passenger to flights within Slovakia, €25 per passenger to flights to other countries in the European Union, and €50 per passenger to flights to other countries outside the European Union. The suggested rate for air freight is €1.25 per tonne. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

- **Pollution and Resource Taxes:**
  - **Waste – landfill tax:** The level of landfill tax in Slovakia is currently set at €9.96 per tonne for residual municipal waste that arises from areas where at least three recyclable fractions are collected for recycling. Where at least five fractions have been sorted out for recycling the tax drops to €4.98 per tonne (see Appendix for more details).[451] There were some attempts and political proposals to increase the landfill tax in 2013, but this was not included within the most recent amendment of Law No. 17/2004 in December 2013 (amended as Law No. 434/2013 Coll.).[452] Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Municipal waste treatment in Slovakia demonstrates below average performance, with low recycling and high landfill rates.[453] Therefore, it is suggested to gradually increase the rate of landfill tax for non-hazardous wastes to €50 per tonne in 2020 and index rates thereafter so that the tax remains constant in real terms. It is also suggested that a landfill tax on construction waste of €2.40 per tonne is implemented.
  - **Aggregates:** There is currently no tax on aggregates in Slovakia. An aggregates tax helps reduce extraction rates for aggregates, and stimulates the market for the use of secondary materials.[454] The instrument works well alongside taxes for landfilling of construction and demolition wastes. This approach is aligned with

[451] Personal communication with the Slovak Environment Agency.

[452]

[453] IEEP (2013) Steps to Greening Country Report: Slovakia, p.28

[454] European Environment Agency (2008) *Effectiveness of Environmental Taxes and Charges for Managing Sand, Gravel and Rock Extraction in Selected EU Countries*, June 2008, www.eea.europa.eu/publications/eea_report_2008_2

the Roadmap to A Resource Efficient Europe.[455] It is suggested that Slovakia implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this, keeps the rate constant in real terms (either through annual changes, or periodic increases). The types of materials that could be covered by the tax are:

  - Marble
  - Chalk and dolomite
  - Slate
  - Limestone and gypsum
  - Sand and gravel

- **Waste – incineration / MBT tax:** There are currently two incinerators in Slovakia. In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, of €15 per tonne in 2020. An equivalent rate is proposed for MBT facilities which are already operating in Slovakia. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.[456]

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could apply to all packaging placed on the market in Slovakia:

  - Aluminium €197 per tonne
  - Plastic €64 per tonne
  - Steel €54 per tonne
  - Paper and card €20 per tonne
  - Glass €18 per tonne
  - Wood €13 per tonne

  These rates are conservative in that they cover only the embodied CO_2 savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

[455] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

[456] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

- **Single-use carrier bag tax**: There is currently no tax on single-use plastic bags in Slovakia. Plastic bags cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the marine environment. As such, marine litter is specifically mentioned as a pressure in the Marine Strategy Framework Directive (2008/56/EC).[457] A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.[458] Therefore, it is suggested that Slovakia increases the tax on single-use plastic bags to a rate of €0.07 per bag from 2016, and following this to keep the rate constant in real terms.
- **Air pollution:** Slovakia has a system of air pollution taxes in place, but these are relatively low by European standards. The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. There have been notable improvements in air quality, but some issues remain in urban areas.[459] In addition, according to Airbase (EEA) 100% of the urban population in Slovakia is exposed to PM_{10} concentrations exceeding the daily limit value (50 µg/m^3) for over 35 days per year.[460] The existing rates could be increased further to generate additional incentives for abatement, and hence, improvements in air quality. The suggested tax rates are as follows:
    - SOx €1,000 per tonne
    - NOx €1,000 per tonne
    - PM_{10} €2,000 per tonne

  Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing to maximum levels. The rates are then held constant in real terms. These may also assist in ensuring that stationary sources meet proposed BAT AELs under the Industrial Emissions Directive.

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[457] DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF

[458] DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

[459] IEEP (2013) *Steps to Greening Country Report: Slovakia*, Report for the European Commission, p.24

[460] Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

- **Water abstraction:** A central theme of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*. Slovakia already has a water abstraction fee, but the rates are relatively low. It is suggested that rates for the abstraction of water for public supply are set to €90 per 1,000m^3, with lower rates applied to abstraction for manufacturing purposes and for agriculture (€55 per 1,000m^3 and €8 per 1,000m^3 respectively). Given the magnitude of the suggested increase in rates, a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from existing levels to those suggested. The rates are then held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.[461] Slovakia has waste water charges already but at a low level. To improve prevention of water pollution it is suggested to implement a waste water tax and adjust tax rates in-line with 'good practice'. With relative price levels in Slovakia this would imply a rate of €1.52 per kg BOD. For fresh-water discharges also phosphorus should be charged. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

  > *"…timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets"*

  Slovakia's National Pesticide Action Plan does not set objective pesticide reduction targets, but recognises that *"prevention must be the starting point for protection"*.[462] The document recognises the need to protect the environment and human health and provides data to suggest that application of active ingredients to agricultural land has fluctuated between 2002 and 2011, but shown no real decreasing trend (rates have fluctuated between 0.97 kg of active substance per

[461] DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

[462] Ministry of Agriculture and Rural Development of the Slovak Republic (2012) *National Action Plan to Achieve the Sustainable Use of Pesticides*, November 2012, http://Ec.Europa.Eu/Food/Plant/Pesticides/Sustainable_Use_Pesticides/Docs/Nap_Slovakia_En.Pdf, Section 4.3.2, p. 22

hectare in 2008 and a high of 1.31 kg of active substance per hectare in 2010).[463] There is currently no tax on pesticides in Slovakia. Different active ingredients in pesticides vary in the extent to which they may cause harm to the environment. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Slovakia. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €5 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would support progress towards the objectives set out in the National Pesticide Action Plan.

- **Fertilisers**: Slovakia does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of non-organic nitrogen in fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.10 per kilogram of nitrogen be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

Removal of Environmentally Harmful Subsidies

Environmentally harmful subsidies for which forgone revenues have been identified by previous studies are listed in Table 32. In Appendix A.6.4 we also present a full list of subsidies for which no figures for forgone revenues are available. Examples of environmentally harmful subsidies include:

- **Company cars:** Company cars receive favourable treatment in Slovakia's tax system.[464,465] This promotes the over-use of such cars through reducing the marginal costs of driving. Addressing these implicit subsidies would generate significant additional revenue.
- **Coal subsidies and excise duty exemptions:** Slovakia currently provide significant subsidies to electricity generation from domestic lignite, as a measure to reduce

[463] Ministry of Agriculture and Rural Development of the Slovak Republic (2012) *National Action Plan to Achieve the Sustainable Use of Pesticides*, November 2012, http://Ec.Europa.Eu/Food/Plant/Pesticides/Sustainable_Use_Pesticides/Docs/Nap_Slovakia_En.Pdf, Table 3, p. 42

[464] Copenhagen Economics (2009) *Taxation Papers: Company Car Taxation*, Report for European Commission, November 2009, p.6, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf. Note, however, that the study by Copenhagen Economics did not have any data for Bulgaria, Cyprus, Estonia, Ireland, Latvia, Lithuania, Malta, and Romania.

[465] European Commission (2013) *Tax Reforms in EU Member States 2013*, May 2013, p.73, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf

dependencies on energy imports and for social reasons.[466] Several exemptions from excise duties also continue to apply to households and energy-intensive industries.[467] Phasing out these subsidies and tax concessions could encourage change in energy-consumption patterns.

Table 80: Environmentally Harmful Subsidies - Amounts Involved

Subsidy	Amount involved (€ million, real 2013 terms)
ENERGY	
Exemptions from the coal tax	39.6 [1] - 40.1 [2]
Exemptions from the Natural gas tax	54.2 [1] - 51.4 [2]
Electricity generation from domestic lignite supported by a feed-in tariff system	69.9 [1] - 72.9 [2]
TRANSPORT (excl. transport fuels)	
Preferential treatment for company cars	214.1[3]
POLLUTION & RESOURCES	
Raising accessibility of lignite reserves in Hornonitranske Bane, Prievidza, a.s.	5.1 [2]
Coal allowances for former miners and miners' widows	0.4 [1,2]
Support for phasing out mining activity by Bana Dolina, Vel'ky Krtis, a.s.	0.2 [2]
Total	384

Notes:

1) *Amount involved stated in: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp.307-314, dx.doi.org/10.1787/9789264187610-en*

2) *Amount involved stated in: Table 4 in IEEP (2013) Steps to Greening Country Report: Slovakia, Report for the European Commission, p.10*

3) *Amount involved stated in: Table 3.6 in Copenhagen Economics (2009) Taxation Papers: Company Car Taxation, Report for European Commission, November 2009, p.28, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf*

17.2.3 Summary of Revenue Outcomes

Table 81 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made (either using price elasticities

[466] OECD (2011) *Environmental Performance Reviews: Slovak Republic 2011,* 2011, p.46, http://dx.doi.org/10.1787/9789264121836-en

[467] OECD (2011) *Environmental Performance Reviews: Slovak Republic 2011,* 2011, p.118, http://dx.doi.org/10.1787/9789264121836-en

or estimates of level of reductions as a percentage of the initial level) reflecting the changes in price suggested.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 5.1 above).

Table 81: Potential Additional Revenue from Environmental Fiscal Reform in Slovakia, million EUR (real 2013 terms)[468]

Type	2016	2020	2025
Energy			
Transport fuels	36	178	281
C&I / Heating	70	324	495
Electricity	0	0	0
Sub-total Energy, million EUR	106	502	775
Sub-total Energy, % GDP	0.14%	0.57%	0.76%
Transport (excl. transport fuels)			
Vehicle Taxes	112	634	731
Passenger Aviation Tax	25	50	52
Freight Aviation Tax	0.02	0.04	0.05
Sub-total Transport, million EUR	137	683	783
Sub-total Transport, % GDP	0.17%	0.77%	0.77%
Pollution and Resource			
Landfill Tax - Non-haz (excl. C&D)	34	76	81
Landfill Tax - Inerts (C&D)	0	0	0
Incineration /MBT Tax	2	5	5
Air Pollution Tax	26	43	33
Water Abstraction Tax	14	30	27

[468] % GDP calculated using the following source: Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

Type	2016	2020	2025
Waste Water Tax	26	37	37
Pesticides Tax	6	12	13
Aggregates Tax	89	58	64
Packaging Tax	16	17	20
Single Use Bag Tax	49	11	12
Fertiliser Tax	0.007	0.014	0.016
Sub-total Pollution & Resource, million EUR	262	288	291
Sub-total Pollution & Resources, % GDP	0.33%	0.33%	0.29%
Total Environmental Taxes			
Total, million EUR	505	1,473	1,849
Total Increase, % GDP	0.64%	1.67%	1.82%
Total Environmental Harmful Subsidies			
Total, million EUR	384	384	384
Total Increase, % GDP	0.52%	0.50%	0.49%
Total Potential for Environmental Fiscal Reform			
Total, million EUR	**889**	**1,857**	**2,233**
Total Increase, % GDP	**1.16%**	**2.17%**	**2.30%**

17.2.4 Environmental Benefits

Table 34 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for this calculation of these numbers is given in Section 5.2. The coverage of environmental benefits is not fully comprehensive. Even so, EUR 226 million of benefits are anticipated annually by 2025 in real terms.

The most significant environmental benefits are due to reductions in SOx, NOx and PM10 emissions, reduced combustion of coal used in industry and reduced reliance on landfills.

Table 82: Monetised Environmental Benefits from Implementation of Taxes, million EUR (real 2013 terms)

Tax Type	2016	2020	2025
Energy	14	64	94
Transport	7	21	21
Pollution & Resources	40	127	110
Total, million EUR	61	212	226
Total, % GDP	0.08%	0.27%	0.27%

17.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Slovakia:[469]

- In 2012 environmental taxes generated revenue equivalent to 1.75% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes. These taxes could generate an additional **€0.51 billion** in 2016, rising to **€1.8 billion** in 2025 (both in real 2013 terms). This is equivalent to **0.64%** and **1.8%** of GDP in 2016 and 2025 respectively. Further revenue could be generated by removing environmentally harmful subsides which are estimated to be **€0.38 billion** in 2016 (real 2013 terms), equivalent to **0.49%** of GDP.
- The largest single contribution comes from suggested changes in vehicle taxation. This accounts for **€0.73 billion** by 2025 (real 2013 terms), equivalent to **0.58%** of GDP. In line with Commission proposals of 2005, it was suggested that the increase should focus on the circulation tax (with these being differentiated according to the environmental performance of the vehicles), and possibly also the system of road tolls.
- Following harmonisation of rates for fuels used by businesses for heating, additional revenue of approximately **€0.49 billion** could be generated in 2025 (real 2013 terms), equivalent to **0.39%** of GDP.
- It was suggested that taxes on transport fuels be equalised using the energy content of petrol. If this were to occur the increase in excise duties on the other transport fuels could provide **€0.28 billion** of additional revenue in 2025 (real 2013 terms), equivalent to **0.22%** of GDP.

[469] % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115

- Increasing the rate of Slovakia's landfill tax on non-hazardous residual waste was estimated to yield an additional **€0.08 billion** in 2025 (real 2013 terms), equivalent to **0.06%** of GDP.
- The suggested aggregates tax could lead to **€0.06 billion** of additional revenue in 2025 (real 2013 terms), equivalent to **0.05%** of GDP.
- In addition, minor taxes on, *inter alia*, the discharge of waste water, passenger aviation, air pollution, and water abstraction, could generate revenue of **€0.2 billion** in 2025 (real 2013 terms), equivalent to **0.16%** of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around **€0.23 billion** (real 2013 terms), or **0.27%** of GDP in 2025.
- In the context of the European Semester in 2013, the European Commission made a recommendation, including the following:
    - *Improve energy efficiency in particular in buildings and industry.*

  Changing energy taxes could assist in aligning Slovakia's fiscal system with the recommendation, whilst other suggestions made above would assist in correcting fiscal deficits.

18.0 Cross-Country Comparative Results

All figures are given in real (2013) terms. For the group as a whole, additional revenue generated in 2016 is estimated to be around €35 billion, or 0.63% of the estimated GDP for the 12 countries combined, rising to €101 billion in 2025 (in real 2013 terms), or 1.57% of the combined GDP. In addition, in 2016, around €24 billion in real 2013 terms, or 0.43% of the combined GDP, could be saved by removing some environmentally harmful subsidies (there was no forward projection of savings for the subsidies).

Table 83, Table 84 and Table 85 below show the split of revenue generation by the different types of environmental taxes which are suggested to be implemented in the 12 Member States. The majority of the overall increase comes from additional taxes on transport (excl. transport fuels) (0.84% of GDP). Additional revenue generated from increasing energy excise duties amounts to 0.44% of GDP. Finally, an increase of 0.28% of GDP is estimated from increased taxes on pollution and resources.

Table 83: Revenue Generated from Energy Taxes by the 12 Member States in 2025, % GDP and € billion (real 2013 terms)

	% GDP	€, billion
Energy Excise Duties - Transport fuels	0.26%	16.74
Energy Excise Duties - C&I / Heating	0.11%	7.10
Energy Excise Duties - Electricity	0.07%	4.40
Total Energy Taxes	**0.44%**	**28**

Table 84: Revenue Generated from Transport (excl. transport fuels) Taxes by the 12 Member States in 2025, % GDP and € billion (real 2013 terms)

	% GDP	€, billion
Vehicle Taxes	0.66%	42.35
Passenger Aviation Tax	0.18%	11.80
Freight Aviation Tax	0.00005%	0.003
Total Transport (excl. transport fuels) Taxes	**0.84%**	**54**

Table 85: Revenue Generated from Pollution and Resource Taxes by the 12 Member States in 2025, % GDP and € billion (real 2013 terms)

	% GDP	€, billion
Landfill Tax - Non-haz (excl. C&D)	0.03%	1.91
Landfill Tax - Inerts (C&D)	0.0005%	0.03
Incineration /MBT Tax	0.01%	0.41
Air Pollution Tax	0.03%	1.69
Water Abstraction Tax	0.11%	6.98
Waste Water Tax	0.01%	0.91
Pesticides Tax	0.03%	1.94
Aggregates Tax	0.05%	3.01
Packaging Tax	0.02%	1.07
Single Use Bag Tax	0.01%	0.34
Fertiliser Tax	0.00001%	0.001
Total Pollution and Resource Taxes	**0.28%**	**18**

Revenue generated by the 12 Member States from increasing environmental taxes or removing environmentally harmful subsidies is given in Table 86. The size of the economies in the different countries clearly influences the amount of revenue estimated to be generated.

Table 86: Revenue Generation by Member State for Selected Years, € billion (real 2013 terms)

	2016		2020		2025	
	Env. Taxes	EHSs	Env. Taxes	EHSs	Env. Taxes	EHSs
Austria	1.3	0.8	3.4	0.8	3.9	0.8
Belgium	2.2	7.0	6.1	7.0	6.9	7.0
Czech Republic	1.2	0.6	2.1	0.6	2.4	0.6
Estonia	0.2	0.1	0.4	0.1	0.5	0.1
France	12.1	4.8	38.4	4.8	42.9	4.8
Croatia	0.3	0.1	0.6	0.1	0.7	0.1
Hungary	0.7	1.7	2.2	1.7	2.8	1.7
Italy	10.3	7.6	22.1	7.6	25.5	7.6
Lithuania	0.3	0.0	0.6	0.0	0.7	0.0
Poland	3.7	0.3	6.9	0.3	7.8	0.3
Romania	2.0	0.2	4.1	0.2	4.7	0.2
Slovakia	0.5	0.4	1.5	0.4	1.8	0.4
Total	**35**	**24**	**88**	**24**	**101**	**24**

Expressed as a proportion of GDP, the revenues are shown in Table 87. In the year 2025, the estimated additional revenue generation from the environmental taxes lies between 1.01% of GDP (Austria) and 2.51% GDP (Romania). The estimated increases for the other 10 countries considered all lie within the range 1.26% GDP to 2.21% GDP.

The environmental benefits associated with these changes have been estimated, though this analysis does not capture all the external benefits associated with the changes. Table 88 indicates that these benefits lie between 0.03% GDP (France) and 0.55% GDP (Poland) in 2025. The patterns of the benefits reflect the sources of the additional tax revenue.

Table 87: Revenues Generated from Environmental Taxes by Member State, % GDP

	Total Env. Taxes in 2012, % GDP	Total Additional from Env. Taxes in 2025, % GDP
Austria	2.44%	1.01%
Belgium	2.16%	1.51%
Czech Republic	2.35%	1.26%
Estonia	2.78%	1.63%
France	1.83%	1.71%
Croatia	3.17%	1.37%
Hungary	2.50%	2.21%
Italy	3.02%	1.43%
Lithuania	1.66%	1.36%
Poland	2.52%	1.43%
Romania	1.94%	2.51%
Slovakia	1.75%	1.82%
EU-average	2.29%	
EU-Maximum	3.87%	

Table 88: Estimated Indirect Benefits from Reduced Environmental Impacts, 2025, % GDP and € millions (real 2013 terms)

	% GDP	€, million
Austria	0.12%	436
Belgium	0.11%	474
Czech Republic	0.07%	112
Estonia	0.48%	110
France	0.03%	643
Croatia	0.32%	153
Hungary	0.11%	117
Italy	0.06%	966
Lithuania	0.19%	78
Poland	0.55%	2,487
Romania	0.40%	661
Slovakia	0.27%	226

Appendices

A.1.0 Good Practice

A.1.1 Introduction

This Appendix sets out the approach taken in making suggestions to the Member States regarding specific types of environmental tax. It is worth setting out some general principles which we have sought to follow:

1. The approach reflects the study's intention to highlight potential for revenue generation using environmental taxes. The intention is to indicate where this potential may lie, and to demonstrate the magnitude of the revenues that could be derived from the taxes;
2. The environmental impact of measures is considered important, and all the suggestions are expected to have an influence, relative to the counterfactual, on behaviour. To the extent, however, that the environmental effect is considered secondary to the issue of revenue generation, the focus is on taxes rather than, for example, refunded levies (an example of which would be the Swedish charge on NOx). At the same time, we consider the issue of instrument design with a view to engendering a positive environment response;
3. In most cases, we have sought to develop an approach to each type of tax which could be applied to each country. We recognise, however, that each country's starting point is quite different in that some countries have certain taxes in place already, and at varying levels, whilst others may not have introduced such taxes at the time of writing. Furthermore, countries are confronting different environmental problems, and they have different levels of income. Therefore, in making suggestions for each country, we have sought to take into account the current situation when making country specific suggestions. The way we have done this is also explained in the relevant section for each tax.

It will be appreciated that in a cross country study such as this, proposing a fully designed instrument of a given type would not be feasible. We have, however, given some hints as to the types of design which might be suitable to engender a more pro-environmental response from the taxes suggested.

The way in which the revenues generated by changes in suggests tax rates does not always reflect the way we would expect the tax to be implemented in the country concerned. For example, where pesticides are concerned, it is suggested that any taxes which are introduced are banded such that they take into account the potential for environmental harm associated with each active ingredient. In practice, the data available for us to do that has not been available. As such, we have modelled the potential revenue take on a simplified basis. We would, of course, encourage Member States to introduce the suggested taxes with due consideration given to their design features so as to ensure that the tax structure (e.g. the way it is banded) reflects, as closely as possible, the source of the environmental damages.

This document is, as far as we are aware, correct as of the time of drafting, this having begun in late 2013. Taxes and charges are changing all the time. Every attempt has been made to be current, but it is in the nature of the subject that matters will evolve over time, rendering some of the material, in due course, out of date.

A.1.2 Energy (Including Transport Fuel Taxes)

Revenues from energy taxation generally account for the largest share of revenue from all environmental taxes. Energy taxes cover taxes on fuels used in transport, industry and the generation of power and heat. In practice, however, it makes sense to consider energy taxes insofar as they affect the generation of power separately from the taxes applied to vehicle fuels and fuels used for heating. This is because power generation is included within the scope of the EU Emissions Trading Scheme, whereas emissions from transport and from heating are not.[470] The power sector is no longer (in Phase III of the ETS) in receipt of free allowances for GHG emissions, with all allowances for the power sector now auctioned.[471] Some countries do make use of taxes on inputs to electricity generation, or production capacity for electricity. However, these are not harmonised taxes. The situation in respect of power generation in the ETS is considered in Section A.1.14, whilst it should also be noted that air pollution taxes, which may affect power generating installations (as well as their emitters) are considered in Section A.1.4.

Revenues from environmentally-related taxes in EU Member States had, by 2011, declined to 6.2% of taxes and social contribution (TSC), and 2.3% of GDP, from their peak in 1999 of 6.9% of TSC and 2.8% of GDP. There have been very few reductions in the nominal tax rates, so besides TSC/GDP growth being more significant than revenue growth, a key contributing factor for the decline in significance of environmental taxes has been insufficient adjustment to keep pace with inflationary trends, though no doubt, environmental improvements also have contributed by eroding the tax base for specific taxes related to pollution. Environmental tax legislation often details tax rates in absolute units of a currency rather than in ad valorem terms so that the lack of indexation tends to lead to an erosion of the significance of the taxes.

Recognising this, several MS (including Sweden, Denmark, Netherlands) have introduced a system whereby one or more energy tax rates are indexed automatically to an index of inflation. Indexing energy taxes to a measure of inflation might be considered as one element of 'best practice' relevant to budgetary consolidation, and exploring the extent of revenue erosion in the absence of this mechanism (not to mention, erosion of any environmental incentive). Indeed, the proposal from the Commission for an Energy Tax Directive suggested, at Article 4(4), states:

> *4. The minimum levels of general energy consumption taxation laid down in this Directive shall be adapted every three years starting from 1 July 2016 in order to take account of the changes in the harmonised index of consumer prices excluding energy and unprocessed food as published by Eurostat. The Commission shall publish the resulting minimum levels of taxation in the Official Journal of the European Union.*

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[470] It should be noted that several other activities included under the ETS are also not subject to the harmonisation proposals of the existing ETD (as set out in Article 2(4) of the existing ETD, Directive 2003/96/EC). Some activities covered by the ETS are effectively covered by the existing ETD, so both pay the harmonised taxes, and are subject to the requirements of the ETS in terms of their requirement to hold sufficient allowances to cover GHG emissions. The proposed ETD, through identifying a CO_2 component explicitly, allows for installations covered by the ETS to be exempted from this part of the tax.

[471] Some newer Member States have availed themselves of a derogation from the requirement to auction all allowances and will be able to issue a diminishing number of free allowances for the power sector with the number falling to zero in 2020.

The minimum levels shall be adapted automatically, by increasing or decreasing the base amount in euro by the percentage change in that index over the three preceding calendar years. If the percentage change since the last adaptation is less then 0.5%, no adaptation shall take place."

That having been said, it is also clear that energy prices are politically sensitive in many countries, and it may not always be straightforward to index taxes to inflation if the underlying pre-tax prices for energy carriers are increasing at a rate that exceeds the background rate of inflation. We have not proposed *retrospective* increases in rates so as to maintain the real terms value of energy taxes where these have remained constant in nominal terms (or where they have been increased in nominal terms, but at a rate below that of inflation). However, we have proposed that indexation occurs going forward.

The European Union's Energy Taxation Directive (ETD) has, in the past, established minimum levels for energy taxation relating to certain motor fuels, heating fuels and electricity. We refer to these rates as the rates in the existing ETD. A new proposal, referred to henceforth as the proposed ETD, is currently being debated.[472] This proposes new minimum rates of tax for motor fuels, heating fuels, and for electricity. It suggested that these should follow a specific formula linking the tax rate to the energy content of the fuel and the associated greenhouse gas emissions (see below). The proposal, made in 2011, had envisaged the new rates being implemented by January 2013 (with some phasing allowed for some transport fuels).

Most MS have defined tax rates for one or more fuels that exceed the minimum levels in the proposed ETD, but there is rarely consistency in national tax rates across energy carriers according to their basic properties causing some energy products to be treated, relatively, more favorably than others. In the light of this, the proposed revision of the ETD establishes the principle that energy carriers should be taxed in a more consistent manner according to their physical properties, as follows:

- For the transport fuels, the proposed ETD suggests that different fuels be taxed according to energy content (€9.6 per GJ) and GHG emissions (€20 per tonne CO_2 equ.).
- Where motor fuels are used for commercial and industrial purposes specified in Article 8 (2) of the ETD, the minimum tax rates in the proposed ETD are based on energy content (€0.15 per GJ) and GHG emissions (€20 per tonne CO_2 equ.).
- For heating fuels, the tax rates proposed are determined as for the motor fuels used for commercial and industrial purposes; and
- For electricity, the rate in the proposed ETD is €0.15 per GJ (a small upward revision from the rate in the existing ETD).

For the transport fuels, and for the energy content only, then for countries with taxes below the stated minimum rates set out in the proposed ETD, it was envisaged (as per Table A of Annex I) that any necessary increases could be phased in over a period from 2013 to 2018.

[472] The consolidated version of the existing Directive (Council Directive 2003/96/EC) can be found here http://ec.europa.eu/taxation_customs/resources/documents/taxation/com_2011_169_cod_en.pdf

The proposed ETD also made clear that where MS has tax rates in excess of the minimum levels proposed, the approach to setting tax rates for all fuels in the relevant groups (e.g. heating fuels) should respect the principles by which the ETD rates are set, i.e. a consistent application of rates based on the energy content and related CO_2 emissions.

It is recognized that the proposal has not been agreed and continues to be debated in the European Council. However, it was agreed that it should be used as a basis for suggested changes in this work since, although the proposal continues to be debated, it represents the Commission's most recent published thinking in respect of energy taxation. The document used as the basis for the approach taken is:

> European Commission (2011) Proposal for a Council Directive amending Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity, Brussels, COM(2011) 169/3, 2011/xxxx (CNS)

This is referred to, henceforth, as 'the proposed ETD'.

A.1.2.1 Suggested Implementation

Most countries have set rates higher than the minimum rates in the proposed ETD for at least one energy carrier within each of the groupings (transport fuels, commercial and industrial motors and heating fuels), In considering how Member States might respond to the proposed ETD, then in principle, one could have considered harmonization of rates within the given groupings either to the highest level of any energy carrier in the group, or to lowest rate of any energy carrier within the group, or many other possibilities. Given the emphasis in this study on the potential for generating revenue, then the approach is generally based on upward harmonization of tax rates within any grouping to the rate which is, according to the formula set out in the proposed ETD, the highest in terms of the implied rate of tax per unit of energy content, assuming that the CO2 element of the duty is €20/tonne of emissions of CO_2.

This approach does not necessarily lead to harmonization of tax rates across Member States. It follows from the formula in the proposed ETD that harmonization could only occur if all Member States harmonized taxes at the same implied rates of taxation in terms of €/GJ of energy content, and €/tonne of CO_2 emitted..

Motor Fuels

The countries concerned have taxes in place on motor fuels whose rates, and relative rates (across the motor fuels), vary. Most countries have, however, rates which are either similar to, or already well above, minimum rates in the proposed ETD. The approach we have proposed is as follows:

1) Where the rates are below the minimum rates in the proposed ETD, they are increased accordingly;
2) Where the rate for any fuel is above the minimum rate in the proposed ETD, we assume that the CO_2 based element of the tax is equivalent to €20 per tonne CO_2, as per the proposed ETD. We then calculate the implied tax rate per GJ for each of the fuels. We then propose tax rates for all fuels which are based on equal tax rates for the energy component of the fuel.

If 1) applies, then the tax rate changes are assumed to occur over a period to 2018 as per the proposed ETD. If 2) applies, then alignment of all taxes to that of the fuel with the highest implied tax per unit of energy is assumed to occur over a period to 2023, as per the proposed ETD.

It should be noted that for many countries, the suggested approach implies an upward harmonisation of duties on diesel to reflect the implied energy-related tax on petrol. Differentials

regarding rates of duty for transport fuels already give rise to concerns, in some Member States, over so-called 'tank tourism'. Depending upon how different Member States choose to respond to the suggestions made (some of the Member States under consideration share borders), it is recognised that concerns regarding tank tourism might be more or less prominent. The changes suggested are intended to indicate potential for additional revenue, and could not anticipate how each Member State would respond, still less, how other countries (both within and outside the EU-28) might choose to adjust taxes on transport fuels in future. The objective of this work is not to establish a tax harmonising proposal across all member States (indeed, since it covers only 12 Member States, it would be impossible do so).It should also be noted that in Denmark, in order partly to address the potential for tank tourism, circulation taxes on diesel vehicles are higher than those on petrol-driven vehicles to compensate for the fact that tax rates on diesel are lower than they would otherwise be (indicating, as per the transport section below, some interdependence of circulation taxes and fuel taxes). Respecting the formula in the proposed ETD makes it difficult for Member States to take such compensating measures since the applicable tax rates have to be harmonised with respect to energy and CO_2 content, but this remains a possibility for the time being given that the proposal has not become law.

Heating Fuels

There is considerable variation in tax rates applied across MS for heating fuels (see Table 89 and Table 90 below). A general pattern that can be discerned is that, when expressed in terms of the tax rate per GJ, mineral oils tend to be taxed at considerably higher rates than natural gas and coal. The propensity for relatively high tax rates on mineral oils also for heating purposes may historically be related to a desire to promote other energy carriers than oil, and to the concern in some Member States that setting different rates of tax for different uses of the same fuel might encourage fraudulent use of the fuel. Electricity is also frequently taxed at a more significant level than natural gas and coal, being taxed at a higher rate than oil, in terms of energy content, in seven MS.[473] Finally it remains the exception that fiscal administrations consider the energy contents of heating fuels.

The existing ETD has established minimum rates for a range of heating fuels used for non-business and business purposes, notably coal, mineral oils and natural gas. There are also minimum rates for electricity, which in several MS is used for heating purposes.

Identification of best practice for taxation of heating fuels is complicated by the various energy mixes employed by MS across Europe for heating purposes. Low tax rates for certain energy carriers may be used to favor and promote national interests in their wider uptake.

Table 89 below provides the effective tax rates in EU MS for the most important heating fuels in non-business sector, whilst Table 90 does the same for the business sector. A weighted average has been computed for each MS, taking into account its specific energy mix.[474] To allow for an illustrative comparison (exemptions were not accounted for in the weighted rate), all tax rates

[473] This might be expected, to a degree, given the fact that non-renewable forms of electricity typically convert fossil energy carriers into electricity at an efficiency well below 100%. Hence, the energy content of electricity reflects a conversion of input fuels with a much higher energy content.

[474] Estimates for the heating energy mix are available from the EU funded ECOHEATCOOL project (see S. Werner et. al., 2007, ECOHEATCOOL, The European Heat Market, Final Report, Bruxelles: Euroheat and Power).

have been converted into the same metric (i.e. energy content). The final column of the table indicates the effective tax rate implied by adoption of the ETD amendments. While the minimum rate proposed is €0.15/GJ, the proposed CO_2-element has been converted into an implicit tax rate per GJ too to allow comparison. This is important for heating fuels as the CO_2 element accounts for between 88%-93% of the proposed minimum rates under the ETD, depending on the fuel.

Table 89: Implicit Energy Tax Rates for Non-business Heating Based on Energy Contents

€ per GJ	COAL	OIL	GAS	ELECT	Weighted for MS	ETDwCO2 (weighted)*
AT	1.70	2.78	1.66	4.17	2.85	1.50
BE	0.40	0.49	0.27	0.53	0.42	1.46
DK	11.55	11.24	10.71	30.53	19.23	1.45
FI	5.20	4.64	2.91	4.73	4.71	1.63
FR_{2014}	0.64	1.67	0.39	6.94	2.81	1.39
DE	0.30	1.74	1.53	5.69	2.58	1.42
EL	0.30	9.38	1.50	0.61	6.68	1.63
IE	0.95	2.91	1.03	0.28	1.52	1.60
IT	0.32	11.46	4.73	6.31	6.40	1.36
LU	0	0	0.30	0.28	0.16	1.46
NL	0.52	12.51	5.29	32.36	11.41	1.27
PT	0	9.38	0.30	0.28	3.46	1.57
ES	0.65	2.41	0.65	0.28	1.05	1.46
SE	13.76	13.11	9.50	9.61	10.07	1.59
UK	0	3.68	0	0	0.25	1.32
CY	0.31	3.54	2.60	1.39	2.27	1.63
CZ	0.34	12.41	0.34	0.31	0.47	1.39
EE	0.30	3.15	0.70	1.24	1.05	1.42
HU	0.31	11.32	0.31	0.28	0.65	1.31
LV	0.30	1.63	0.46	0.28	0.50	1.50
LT	0.30	0.60	0	0.28	0.25	1.47
MT	0.30	4.61	0.84	0.42	1.72	1.63
PL	0.31	1.61	0	1.35	0.62	1.65
SK	0	10.98	0.37	0	0.26	1.31
SI	1.47	3.58	1.33	0.85	2.31	1.57
BG	0.31	0.73	0.05	0.28	0.29	2.01
HR	0.31	1.31	1.09	0.28	0.82	1.41
RO	0.30	9.39	0.32	0.28	1.25	1.32
Average					3.07	1.49
NMS-average					0.96	1.51
EU15-average					4.91	1.47
NMS-best practice (SI, MT, CY)					2.10	
EU15-best practice (DK, EL, NL, SE)					11.78	
EU best quartile (DK, EL, FI, NL, IT, PT, SE)					8.85	
*Excluding electricity for which CO_2 price is determined by ETS						

Source: Member state reporting to European Commission, DG TAXUD excise tables, July 2013. Please refer to these tables for all details on exemptions, reduced and banded rates etc.

Table 90: Implicit Energy Tax Rates for Business Heating Based on Energy Content

€ per GJ	COAL	GAS OIL	GAS	ELECTR	Weighted for MS	ETDwCO2 (weighted)*
AT	1.70	2.78	1.66	4.17	2.75	1.56
BE	0.40	0.49	0.13	0.83	0.46	1.52
DK	11.55	11.24	10.71	15.12	12.46	1.49
FI	5.20	4.64	2.91	1.95	2.92	1.65
FR_{2014}	0.64	1.67	0.39	4.73	2.20	1.51
DE	0.30	1.31	1.14	4.27	2.33	1.51
EL	0.30	9.38	1.50	0.69	4.61	1.68
IE	0.95	2.91	1.03	0.14	1.54	1.53
IT	0.16	11.46	0.34	3.47	3.21	1.45
LU	0	0	0.15	0.14	0.12	1.42
NL	0.52	12.51	5.29	32.36	14.64	1.40
PT	0.16	9.38	0.30	0.28	3.80	1.53
ES	0.65	2.41	0.15	0.14	0.63	1.44
SE	4.13	3.93	2.85	0.16	1.46	1.71
UK	0	3.68	0	0	0.70	1.45
CY	0.31	3.54	2.60	1.39	3.10	1.67
CZ	0.34	12.41	0.34	0.31	2.01	1.61
EE	0.30	3.15	0.70	1.24	1.32	1.49
HU	0.31	11.32	0.31	0.29	1.28	1.45
LV	0.30	1.63	0.46	0.28	0.57	1.37
LT	0.15	0.60	0	0.14	0.13	1.47
MT	0.30	11.43	0.84	0.42	0.42	n.a.
PL	0.31	1.61	0	1.35	0.73	1.76
SK	0.31	10.98	0.37	0.37	1.31	1.61
SI	1.47	3.58	1.33	0.85	1.46	1.43
BG	0.31	0.73	0.05	0.28	0.35	1.64
HR	0.31	1.31	0.55	0.14	0.68	1.50
RO	0.15	9.39	0.17	0.14	1.03	1.41
EU28 average					2.44	1.33
NMS-average					1.10	1.28
EU15-average					3.59	1.37
best3-NMS (SI, CZ, CY)					2.19	
best4-EU15 (DK, NL, EL, PT)					8.88	
best-quartile (DK, NL, FI, , CY, IT, PT, EL)					6.16	

*Excluding electricity for which CO_2 price is determined by ETS

Source: Member state reporting to European Commission, DG TAXUD excise tables, July 2013. Please refer to these tables for all details on exemptions, reduced and banded rates etc.

It appears that tax rates within individual MS are rarely consistent, if ever, in terms of the way they treat different energy carriers and fuels. Furthermore some MS appear to have no tax rates in place even where minima have been defined within the existing ETD. It has not been the purpose here to clarify the legal status of these apparent derogations.

There are fairly considerable discrepancies between old and new MS, with the latter practicing modest tax rates.

Identifying an overall EU best practice for non-business heating based on the highest quartile comes to an average of €8.85/GJ[475]. This is based on Greece, Portugal, Italy, Netherlands, Finland, Denmark and Sweden. While the highest tax burdens are found where heating is respectively most and least needed, findings from the ECOHEATCOOL project demonstrate that per capita energy consumption for domestic heating purposes in Belgium and France are in fact higher or at the same level as in somewhat colder Denmark. There are further indications that there is untapped potential in improving energy efficiency across wide parts of Europe and for which purpose a more consistent approach to taxation of heat energy carriers according to energy content would be useful. For business heating the best practice quartile MS are Cyprus, Italy, Portugal, Greece, Netherlands, Denmark and Germany.

The proposed approach is based on moving towards the rates proposed for the ETD-amendment in much the same way as with motor fuels. In other words:

1) Where the rates are below the minimum rates in the proposed ETD, they are increased accordingly;
2) Where the rate for any energy carrier is above the minimum rates in the proposed ETD, we assume that the CO_2 based element of the tax is equivalent to €20 per tonne CO_2, as per the proposed ETD. We then calculate the implied tax rate per GJ for each of the energy carriers. We then suggest tax rates for all fuels which are based on equal tax rates for the energy component of the fuel.

If 1) applies, then the tax rate changes are assumed to occur over a period to 2018 as per the proposed ETD. If 2) applies, then alignment of all taxes to that of the fuel with the highest implied tax per unit of energy is assumed to occur over a period to 2023, as per the proposed ETD. Note that the proposed ETD does not appear to provide for this additional period in the case of heating fuels, but the variation in levels suggests that such a period for adaptation would be necessary given the magnitude of the proposed changes.

One difficulty presents itself with using this approach: several countries use the same tax rate for fuels which are used in different applications (e.g. diesel or kerosene used as fuel for vehicles, industrial motors and heating). Because of the considerable differential between the energy-related taxes in the different applications in the proposed ETD (the tax rate per GJ differs

[475] The CO_2-component (at €20/tCO_2) of this best practice figure is about €1.30/GJ for non-electricity with current mix of heat energy carriers in EU. The CO_2-component will range from €1.12/GJ in Netherlands to €1.50/GJ in Poland.

by a factor of 64), the strict application of this approach would lead to suggested hikes in tax rates for e.g. gas used as heating fuel that are extremely large. This can be readily appreciated by reviewing Table 89 and Table 90 above. Wherever there are large differences between the rates for oils, and the rates for other fuels, harmonisation in line with the highest taxed energy carriers clearly leads to considerable hikes in rates (see the cases of CZ, HU, SK and RO, for example, all of which are included within this study). One of the reasons for this is concern regarding fraud, and the potential for using fuels purchased at rates applicable for heating in applications such as use in vehicles. Maintaining a single rate makes such fraudulent / black market transactions unlikely.[476]

As a result of this, we have assumed the rates are harmonized upwards to the rates equivalent to the highest tax rate per GJ applied to the heating fuels other than gas oil and kerosene.

It is quite clear from the above that, as with motor fuels, the possibility to go further than this in terms of revenue generation may exist. Among the 12 MS considered here Italy closest to the levels of best practice.

Electricity

For electricity, the proposed approach is to increase electricity taxes to the level proposed in the ETD (€0.15 /GJ). This is a very limited change to the rate in the existing ETD (of €0.50/MWh, the proposal being equivalent to €0.54 per MWh). The rate is assumed to be applied in 2015. No further changes are considered here reflecting the position of the power sector in the EU-ETS and the fact that all allowances for the power sector will be auctioned (other than for some newer Member States, where a declining quantity of allowances can be issued free of charge, falling to zero in 2020).

[476] Some countries setting similar rates offer rebates on tax where the user provides documentary evidence of the use of the fuel for the purpose of heating. This is then, in turn, sometimes, identified as an environmentally harmful subsidy, even though it seems clear that the combined mechanism is intended to prevent fraud,

A.1.3 Transport Taxes (excluding fuel)

A.1.3.1 Vehicle Taxes

The approach taken by Member States in respect of vehicle taxation varies considerably from one country to the next. Quite apart from the variation in VAT rates (EMEA suggests these vary from a low of 15% to a high of 27% across the EU), the countries of the EU make use of different taxes on the purchase / registration and the use of vehicles. In essence, a key distinguishing feature of these taxes is whether or not they are paid once (on purchase / initial registration) or annually (in the form of a license fee). A 2012 Communication from the Commission distinguishes between 'registration' taxes and 'circulation' taxes as follows:[477]

> *The term 'registration tax' used in this Communication includes all kinds of taxes currently linked to the registration of a vehicle, regardless of their name (tax, excise duty, environmental bonus-malus scheme, etc.) but does not cover fees covering the administrative cost for registration of a vehicle or the cost of technical inspections.*
>
> *The term 'circulation tax' used in this Communication includes all kinds of taxes linked to the circulation of a car in the territory of a Member State, regardless of the name of the tax, excluding tolls, vignettes and excise duties on fuels.*

Regarding the former, it notes:

> *At present, 18 Member States levy a registration tax on vehicles. The tax base and level of taxation differ considerably between Member States. Most common differentiators are the purchase price or value of the car, the fuel used (e.g. petrol or diesel), engine size or power and the CO_2-emissions of a car. Over the last years, many Member States have restructured the tax base of registration and circulation taxes to be totally or partially CO_2 based. National registration taxes are typically levied once in the lifetime of a car, except in Belgium, where they are levied each time the (private) ownership of a car changes.*

Regarding the latter, the circulation taxes, it notes:

> *Typically, circulation taxes are levied annually by the Member State in which a passenger car is registered and are differentiated according to engine size or engine power, the fuel used and/or the environmental performance of the car.*

The tax bases for the circulation taxes are generally similar – weight, CO_2 emissions, engine capacity, engine power, etc. – to those for the registration taxes, with those countries that have both in place sometimes using the same base for the calculation of the tax rate.

[477] Communication from the Commission to the European Parliament, The Council And The European Economic And Social Committee (2012) Strengthening the Single Market by removing cross-border tax obstacles for passenger cars, COM(2012) 756 final, 14/12/2012.

The Staff Working Document accompanying the Communication indicated that of the (then) 27 MS, only four had no circulation tax. Of these four, two – Lithuania and Estonia – were listed as having neither a registration tax nor a circulation tax in place.[478]

Countries with high levels of revenue generation from registration taxes include:

1. Malta, where the tax is based on a quite sophisticated system depending on the vehicle. For example, for passenger cars, the percentage of the retail value to be paid is based both on the length of the vehicle and the emissions performance of the vehicle. For petrol-driven cars, the emissions performance is based only on CO_2 emissions, but for diesel powered vehicles, the rate is based also on the emissions of particulate matter. For freight vehicles, the tax rate is based on weight, the cubic capacity of the engine and the emissions standard of the vehicle. The tax generated revenues equivalent to 0.6% GDP in 2011, down from a level of the 0.94% in 2008, and 1.2% in 2000;[479]
2. Denmark, where the tax is applied as a percentage of the purchase price (including VAT), this percentage being higher on the value above a specified level. The rate payable is moderated by the fuel efficiency of the car, measured in terms of the km/l for which the vehicle can run. There is a much higher 'bonus' for improved efficiency above the benchmark level (16 km/l for petrol driven cars and 17 km/l for diesel driven cars) than the malus for reduced fuel efficiency. In 2011, the tax raised revenues equivalent to 0.76% GDP (though the level in the mid-2000s was of the order 1.4% GDP);
3. Finland has a vehicle tax which is paid on the retail value of the vehicle. It applies to cars and vans weighing less than 1,875 kg and motorcycles, and for cars, is related to the CO_2 emissions associated with the vehicle. Depending on these, the tax is between 5% and 50% of the taxation value, which is effectively the retail value inclusive of VAT. For motorcycles, the rate is dependent on engine capacity. In 2011, the tax generated revenue equivalent to 0.55% GDP;
4. The Netherlands. Here, the tax on passenger cars is levied in four bands related to CO_2 emissions, but with different bands for petrol and diesel driven cars. For both types, the tax is calculated using a fixed rate and a variable rate, both of which escalate as one moves into higher emissions bands. The tax on motorcycles and vans, on the other hand, is based on the net catalogue price. In 2011, the tax generated revenue equivalent to 0.33% GDP (down from 0.6% in early 2000s).

These taxes vary in the extent to which they exempt (completely) the lower emission vehicles. They indicate that revenue generation can still be significant even with relatively high differentials across the different bands used to differentiate on environmental performance.

Countries with high levels of revenue generation from circulation taxes include:

1. Denmark, where the tax is charged on the basis of the fuel efficiency (measured in terms of km per litre of fuel). The rates are quite different for diesel driven cars and petrol driven cars, and since 2009, an additional amount is due on diesel vehicles without an

[478] Commission Staff Working Document (2012) Principles of taxation of motor vehicles according to EU law as interpreted by the Court of Justice, SWD(2012) 429 final, Brussels, 14.12.2012, http://ec.europa.eu/taxation_customs/resources/documents/taxation/other_taxes/passenger_car/swd_2012_429_en.pdf

[479] These are the most recent figures from the DG TAXUD database.

approved filter for removal of particulate matter. In 2011, the tax raised the equivalent of 0.53% GDP;

2. Ireland, where motor tax used to be raised on the basis of the engine size (cc), but since 2008, the tax base has been the emissions of CO_2 per km. There is no zero rate, and there are twelve bands to the tax. The lowest rate of tax payable is €120 and the highest is €2,350 (see Table 91 below). The tax raised revenues equivalent to 0.6% GDP in 2011 and 0.62% GDP in 2012.

Table 91: Irish Motor Tax for New Private Cars

Band	CO_2 emissions-grams per km	Annual €	Half-year €*	Quarterly €!	Arrears Monthly €#
A0	0	120	66	33	12.00
A1	1-80g	170	94	48	17.00
A2	More than 80g/km up to and including 100g/km	180	99	50	18.00
A3	More than 100g/km up to and including 110g/km	190	105	53	19.00
A4	More than 110g/km up to and including 120g/km	200	111	56	20.00
B1	More than 120g/km up to and including 130g/km	270	149	76	27.00
B2	More than 130g/km up to and including 140g/km	280	155	79	28.00
C	More than 140g/km up to and including 155g/km	390	216	110	39.00
D	More than 155g/km up to and including 170g/km	570	316	161	57.00
E	More than 170g/km up to and including 190g/km	750	416	211	75.00
F	More than 190g/km up to and including 225g/km	1,200	666	339	120.00
G	More than 225g/km	2,350	1,304	663	235.00
			*55.5% of the annual rate (disregard cent)	!28.25% of the annual rate (disregard cent)	#1/10 of the annual rate (disregard cent after multiplication)

3. UK, where the vehicle excise duty has some of the characteristics of a registration tax in that, for vehicles first registered after April 2010, there is a 'first year' rate payable. Both

the 'first year' rate, and the rate payable annually thereafter, are banded according to CO_2 emissions per kilometre. The first year rate is zero-rated to a higher level of CO_2 emissions per kilometre, and the escalation is more rapid as one steps through subsequent bands. Hence, for the first year rate, the differentiation between vehicles with higher and lower emissions (between £0 and £1,065) is greater than is the case for rates payable in subsequent years (between £0 and £490), giving a stronger signal to purchasers of vehicles at the point of purchase. The tax raised revenue equivalent to 0.36% GDP in 2011 (see Table 92 and Table 93).

Table 92: UK Vehicle Excise Duty Rates, Petrol and Diesel Cars, 2013/14

Band	CO2 emission (g/km)	12 months rate	6 months rate
A	Up to 100	£0.00	Not available
B	101-110	£20.00	Not available
C	111-120	£30.00	Not available
D	121-130	£105.00	£57.75
E	131-140	£125.00	£68.75
F	141-150	£140.00	£77.00
G	151-165	£175.00	£96.25
H	166-175	£200.00	£110.00
I	176-185	£220.00	£121.00
J	186-200	£260.00	£143.00
K[1]	201-225	£280.00	£154.00
L	226-255	£475.00	£261.25
M	Over 255	£490.00	£269.50

Note:

1) *Includes cars with a CO_2 figure over 225g/km but were registered before 23 March 2006.*

Table 93: UK Vehicle Excise Duty, First Year Rates for Petrol and Diesel Cars 2013/14

Band	CO2 emission (g/km)	12 months rate	6 months rate
A	Up to 100	£0.00	Not available
B	101-110	£0.00	Not available
C	111-120	£0.00	Not available
D	121-130	£0.00	Not available
E	131-140	£125.00	£68.75
F	141-150	£140.00	£77.00
G	151-165	£175.00	£96.25
H	166-175	£285.00	Not available
I	176-185	£335.00	Not available
J	186-200	£475.00	Not available
K	201-225	£620.00	Not available
L	226-255	£840.00	Not available
M	Over 255	£1,065.00	Not available
Note: These rates are for a vehicle's first tax disc when it is first registered.			

4. Netherlands, where the tax payable is calculated using type and weight of the vehicle, type of fuel and province of residence of the owner. For example:

    1. Passenger car, 1,400 kg, petrol: from € 748.00 (province of Zeeland) to € 812.00 (province of Zuid-Holland) per year
    2. Passenger car, 1,000 kg, petrol: from € 392.00 (province of Zeeland) to € 420.00 (province of Zuid-Holland) per year
    3. Passenger car, 1,000 kg, diesel: from € 896.00 (province of Zeeland) to € 928.00 (province of Zuid-Holland) per year
    4. Passenger car, 1,000 kg, LPG 3 and natural gas: from € 504.00 (province of Zeeland) to € 536.00 (province of Zuid-Holland) per year

    - Van, used by an entrepreneur, 1,400 kg: € 336.00 per year;
    - Lorry, up to 25,000 kilogram, no towing-hook, no air-suspension and three axles: € 440.00 per year;
    - For a lorry with Euro 0, 1 or 2 the rates are 90%, 75% resp. 60% higher

    In 2011, the tax raised revenue equivalent to 0.86% GDP.

Heavy Goods Vehicles

In addition to taxes on passenger vehicles, to the extent that public authorities may bear responsibility for the upkeep of the majority of the road network (other than those to which tolls are applied directly), then it may make sense for an element of 'cost recovery charging' to be incorporated into the design of 'taxes'. For this reason, the taxation of heavier vehicles linked to (for example) axle numbers and weight, might be considered sensible as these are contributing factors to the impact of vehicles on roads. Noise and other factors, such as the emissions (reflected in the Euro standard of the vehicles concerned) may also be reflected in the design of such taxes.

Directive 2011/76/EU on the charging of heavy goods vehicles for the use of certain infrastructures sets common rules on distance-related tolls and time-based user charges for vehicles with a maximum permissible gross laden weight of not less than 12 tonnes.[480] This regulatory framework aims at improving the functioning of the internal market for road transport by reducing the differences in the levels and systems of tolls and vignettes applicable in Member States and taking better account of the principles of fair and efficient pricing by providing for greater differentiation of tolls and vignettes in line with costs associated with the road use. For example, the Directive gives guidance on how road tolls should be set, and on the approaches for setting external cost charges where these are implemented, and maximum rates thereof. An example of an approach to taxation for HGV vehicles is the HGV-Eurovignette, which applies to Belgium, Denmark, Grand Duchy of Luxembourg, the Netherlands and Sweden (Germany has not been part of the system since September 1st 2003). The Eurovignette is levied on motor vehicles and combinations of vehicles which are destined for the transport of goods by road and whose maximum gross vehicle weight is in excess of 12 tonnes. In each of the countries concerned, the system generally applies in two ways depending on whether the vehicle is registered in the country to whom the tax should be paid, or elsewhere. In Belgium, for example, this is applied as follows:

1. for vehicles which are or must be registered in Belgium: as from the very moment they use a public highway. The Eurovignette is payable for successive periods of 12 months. However, the three-monthly payment of the Eurovignette can be authorized, on reasoned written request, at monthly rate.
2. for other vehicles subjected to the tax: as soon as they are travelling on the road system specified by the King (of Belgium). According to the period during which the vehicle is driven on roads where the Eurovignette applies, the taxpayer can pay a Eurovignette for one day, one week, one month or one year.

The applicable rates (in euro) are shown below. They indicate variation according to the number of axles and the emissions from the vehicle (EURO standards indicate progressively lower emissions of pollutants such as NOx).

[480] Directive 2011/76/EU amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures, OJEU 14.10.2011, L 269, pp.1-16, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:269:0001:0016:EN:PDF

Table 94: Tax Rates Applied under the Eurovignette (€ per vehicle)

Country of registration	Annually		Quarterly (*)		Monthly		Weekly		Daily
	Number of axles:								
	≤ 3	≥ 4	≤ 3	≥ 4	≤ 3	≥ 4	≤ 3	≥ 4	
Belgium									
emission norm non-EURO	960	1,550	288	465	-	-	-	-	-
emission norm EURO I	850	1,400	255	420	-	-	-	-	-
emission norm EURO II and cleaner	750	1,250	225	375	-	-	-	-	-
All other countries									
Vehicles covered by a Belgian trader's number plate or a temporary number plate									
emission norm non-EURO	960	1,550	-	-	96	155	26	41	8
emission norm EURO I	850	1,400	-	-	85	140	23	37	8
emission norm EURO II and cleaner	750	1,250	-	-	75	125	20	33	8

In 2011, in Belgium, the tax revenues amounted to 0.04% of GDP. The same tax (with the same rates) in the Netherlands (for use of vehicles on Dutch roads) raised revenue equivalent to 0.02% GDP in 2011. The tax revenues raised in Denmark, using the same tax structure, were also 0.02% GDP.

A.1.3.2 Good Practice Design

Taxes on Vehicles

The European Commission made, in 2005, a proposal for a Directive on passenger car related taxes. The proposal document noted, regarding consultation on the matter:

> *The gradual phasing out of registration tax, with a refund system to apply during a five to ten year long transitional period and the introduction of a new tax structure linked to CO_2 emissions received broad support.*

As well as dealing with some of the perceived single market distortions flowing from the wide range of registration taxes in different Member States, it foresaw some advantages of this approach:

> *the abolition of RT* [registration taxes] *can take place in a revenue neutral framework as the revenue loss can be off-set by a gradual and parallel transfer of revenue from RT to ACT* [annual circulation taxes] *and, if necessary, from other fiscal measures in*

compliance with Council Directive 2003/96/EC and even to innovative road use charging provisions. These represent a more stable source of revenue for national budgets, as they produce revenue during the entire lifetime of a passenger car, unlike RT which produces revenue only upon purchase of that car. Those Member States applying a high RT will be able to adjust the shift to ACT according to their needs until 2016 at the latest. These countries will have, on the one hand, to face transition costs to adapt and administer their car tax system particularly during the first years of the transitional period, but on the other hand they will benefit from lower administrative costs for managing the car tax system after the end of the transitional period.

Regarding the desirability of incentivising a reduction in CO_2 emissions through the tax system, the proposal noted:

Recent studies provided examples on how Member States can apply the CO_2 based element. In this case the total revenue from the CO_2 based element of the tax should be gradually increased over the period up to 2010 and at the same time the revenue from the old structure of the tax should be gradually reduced if the revenue neutrality is to be respected. Certainly it will belong to each Member State to fix the level of tax in terms of Euros per g CO_2 per km.

It also cited work by COWI regarding the potential for different instruments to move different Member States towards the EU target of 120 g CO_2 / km. It foresaw some convergence in the proportion of revenues which should be related to the CO_2- based incentives:

To avoid further internal market fragmentation based on potential diversified application by Member States of the carbon dioxide element, the Commission proposes that by 1 December 2008 (the start of the Kyoto period) at least 25% of the total tax revenue from registration and annual circulation taxes respectively should originate in the CO_2 based element of each of these taxes. By 31 December 2010, at least 50% of the total tax revenue from both the annual circulation tax and the Registration tax (pending its abolition) should originate in the CO_2 based element of each of these taxes.

Notwithstanding the Commission's proposal, no Directive was ever passed into law, so in principle, Member States retain freedom to establish their own taxation arrangements, subject to other legally binding treaties. Even so, the Commission proposal does point towards the desirability of ensuring the tax system favours the use of vehicles which emit fewer greenhouse gases per kilometre travelled, whilst also proposing the phasing out of registration taxes. As noted above, this phasing out has not (at the time of writing) occurred. Whilst some countries, such as the UK, have in place circulation taxes, but no registration tax, others, such as France, have in place a registration tax, but no circulation tax.

An ACEA summary of revenues raised from different transport taxes (and those related to taxes on energy used in transport) in 15 MS indicated that, excluding VAT, and road tolls, then of the revenues raised from transport taxes, the one-off registration taxes accounted for a share ranging 0% to 61% of the combined revenues from annual ownership taxes and sales and registration taxes (see Table 95).[481] This suggests that there is no clear pattern across the countries.

[481] ACEA Tax Guide 12, Brussels: ACEA, p.5.

Table 95: Revenues from Transport Taxes

	AT € bn 2010	BE € bn 2010	DK DKK bn 2010	DE € bn 2010	ES € bn 2010	FR € bn 2009	GR € bn 2010	IE € bn 2011	IT € bn 2010	NL € bn 2010	PT € bn 2011	FI € bn 2010	SE SEK bn 2010	UK £ bn 2010
Purchase or transfer														
1.VAT on vehicle sales servicing/repair,parts, tyres	2.150	4.349	N.A.	25.750	4.242	13.604	0.342	0.382	18.100	1.304	1.719	1.339	18.500	12.500
2. Fuels & Lubricants	5.102	6.270	17.218	39.990	18.383	32.261	4.293	2.521	31.315	7.663	2.498	3.362	50.500	27.010
3. Sales & registration taxes	0.450	0.378	13.431		0.653	1.919	0.249	0.384	1.142	2.005	0.627	0.958		
Annual ownership taxes	1.596	1.455	10.077	8.500	2.813	1.270	1.590	0.990	6.610	3.608	0.396	0.670	13.500	5.840
Driving license fees		0.007		0.010	0.080	-				0.239				
Insurance taxes	0.324	0.734	1.855	3.500	0.692	3.934			4.051			0.284	3.100	
Tolls	1.409		0.356			9.350			1.422					
Customs duties		0.093		0.525		-					0.030			
Other taxes	0.570	0.652		0.820	0.372	1.201	0.055		5.186	1.315	0.370		6.500	1.500
TOTAL	**11.601**	**13.938**	**42.937**	**79.095**	**27.235**	**63.539**	**6.529**	**4.277**	**67.826**	**16.134**	**5.64**	**6.613**	**92.100**	**46.850**
EURO	**11.6**	**13.9**	**5.8**	**79.1**	**27.2**	**63.5**	**6.5**	**4.3**	**67.8**	**16.1**	**5.6**	**6.6**	**10.5**	**56.6**
GRAND TOTAL = € 375 BN														

Source: ACEA Tax Guide 12, Brussels: ACEA, p.5

At first glance, it may seem odd to implement taxes which are calculated using the same tax base on both registration and circulation. The (typically) one-off nature of registration taxes can be considered as a means to seek to influence the nature of purchases. Because of their one-off nature, registration taxes may be higher than the annual circulation taxes (and not least, for the more polluting vehicles). Clear differentiation of rates according to emissions can act to bring the issue of fuel economy to the consumers' attention. One issue raised regarding registration taxes has been that they have been too high, and have acted as a barrier to vehicle purchase (and the effect of this may have been to slow down the change in the existing vehicle stock to those which emit fewer GHGs in cases where there is an absence of differentiation in line with such emissions). However, in principle, a suitably differentiated registration tax might influence consumption decisions in a positive manner, whilst having little or no effect on rates at which vehicles with lower emissions are purchased if these attract relatively low registration taxes. The differences in rates across Member States do, however, give rise to Single Market concerns.

Annual circulation taxes may also influence purchasing decisions. In principle, they might be considered as taxes which – when suitably differentiated – seek to reflect the annual impact of the vehicles in use, however imperfectly (since ownership does not determine the level of use). Once the vehicle has been purchased, circulation taxes are payable irrespective (generally) of mileage or actual fuel consumed. As such, the purchase of the vehicle leads to annual payments which cannot be avoided, and the level of which will generally be lower (and with lower differentials) than for the one-off registration tax. It could be argued that the annual circulation taxes – to the extent that they seek to change behaviour – are likely to be less influential than taxes on fuel, which more directly influence fuel consumption, and hence, vehicle usage and associated emissions. In the UK, for example, the difference in the tax between different CO_2 bands for vehicle excise duty are of the order £10 per annum, whereas

the costs of the fuel used annually by cars in different bands might vary by £80 or so per annum.

If tax authorities seek to raise more revenue from such taxes, they will generally need to strike a balance between the one-off registration style taxes, and the annual circulation taxes.

The rapidity of the change in the average CO_2 intensity of passenger vehicles in France using the bonus-malus system appears to provide some support for the view that the price at the point of purchase is likely to be a key determinant of the pace of transition to low-carbon vehicles, though from the fiscal point of view, the system, combined with scrapping incentives, has led to net expenditure rather than an influx of revenue. The Austrian Normverbrauchsabgabe (NOVA) appears to be a more moderated form of this approach, with smaller 'bonus' offered in the context of a system of registration taxes.

From the fiscal perspective, if the main flow of revenue is derived from initial purchase of vehicles, this might lead to tax revenues which are less stable since they vary with the number of new registrations made each year (a point made by the Commission in its proposal for a Directive – see above). One advantage of placing a greater burden of taxation on the annual circulation taxes is to ensure greater stability of revenue (and given that such 'taxes' have sometimes had a 'cost recovery' element to them – to fund the maintenance of roads, for example – then revenue stability has much to recommend it). If more revenue is derived from annual taxes, it may also be more straightforward to make periodic adjustments to the tax system since the whole stock of vehicles is affected rather than merely those that are yet to be purchased. Indeed, in some countries, the majority of car purchases in any given year are not purchases of new vehicles, but purchases of second-hand ones (in the UK, this figure has been estimated at 75%).

Additionally, in the case of circulation taxes, there is less scope for strategic purchasing in the wake of announcements regarding future tax rates (if the tax revenues are based more on revenues related to vehicle purchases, then the potential for strategic tax avoidance exists in the period between the announcement of any change and the time at which the change takes effect). Indeed, for the circulation taxes, it may make sense to announce rates some time in advance to indicate a direction of travel and allow consumers to see the likely impact of their purchasing decisions on the taxes they will pay: the opposite may be true of registration taxes, where any early announcement is likely to lead to strategic behaviour. Finally, high registration taxes based on environmental arguments may be counterproductive if consumers can simply import vehicles from other countries to escape high tax burdens. More generally, the variety of different registration tax systems can give rise to problems in the Single Market context.

In principle, therefore, one might suggest a mix of the following:

1. Where registration taxes do not currently do so, to have them reflect the emissions of CO_2, particulates etc.;
2. In line with Commission proposals, to shift more towards circulation taxes, and to ensure that these are increasingly linked to CO_2 emissions, particulates etc., to the extent that the one-off registration payments seem too high;
3. Taxation on heavier vehicles to reflect the impact on road use (weight, axle numbers) and emissions (Euro standards and CO_2 emissions). Note that road tolls can, in principle, be used to reflect some of these impacts, and would be preferable insofar as they could capture all use of such vehicles; and
4. Reflecting the externalities associated with marginal road-use in conurbations, congestion charges where feasible.

It is difficult to be too specific about the best combination of instruments in this area. Each Member State starts from a different point, and the potential for overlap between policies is clear. For example, it seems entirely possible to design a system of circulation taxes which also incorporates the intent of the HGV-Eurovignette (which can take the form of a circulation tax). Equally, to the extent that Member States need to generate revenue to maintain the road system (and wish to reflect the impact of vehicles on road use), then it might be argued that the tax system ought to reflect the non-zero nature of externalities generated even by low emission vehicles (even though this might be better achieved through some form of road pricing).

Many countries have a number of bands for their vehicle taxes, generally according to the CO_2 emitted. The coarseness of the structure varies across countries. In principle, it seems wise to reward innovation through setting relatively narrow bands of, say, 10-15 g CO_2 /km (so that it is easier to envisage adapting and innovating to move a vehicle from one band to another), as applied in countries such as the UK. Member States may wish to ensure that the incremental costs between bands at least reflect the external costs of the emissions from the vehicle although it can be shown that this leads to relatively small differentials if the focus is CO_2 only.

As noted above, the Commission's proposal for a Directive in 2005 recommended that by the end of 2010, at least 50% of the total tax revenue from both the annual circulation tax and the Registration tax should originate in the CO_2 based element of each of these taxes. More generally, it seems clear that the tax system should have embedded within it incentives designed to promote vehicles with a lower environmental impact (and the above proposals reflect this). Arguably, what is more important is to generate a given quantum of revenue through a tax system which promotes a move towards the purchase of vehicles which, other things being equal, emit lower quantities of GHGs and other pollutants than others. This might suggest an overall structure of taxation which (until such time as road-pricing becomes widespread) ensures a baseline of revenue generation, but with incentives for the purchase of vehicles which emit fewer pollutants (including GHGs). To the extent that fuel duties are intended to reflect many of the externalities of fuel generation, some consideration might also be given as to whether incentives for using low-emission vehicles should allow for an implicit tax rate of zero for such vehicles when they clearly contribute to other externalities of transport.

For HGVs, the specification is more straightforward given the Framework set out in Directive 2011/76/EU. This sets a clear framework for HGV taxation, albeit that some elements of the proposed scheme are more complicated than others to apply in all circumstances.

A.1.3.3 Suggested Implementation

Reflecting the above, and recognising that:

1. the issue of the 'correct design' of transport taxes ought, properly, to consider the whole suite of possible interventions (including, for example, the extent to which road pricing / congestion charging is applied – these may not always be reported as 'taxes' as they more closely resemble user charges, even though vehicle 'taxation' may also have, associated with it, some form of cost recovery element). This includes duties on transport fuels, which (whatever the initial intention of their design) internalise externalities associated with fuel use, and, therefore, tend to overlap in their effect with circulation taxes that are banded according to emissions, but also, registration taxes;
2. different Member States have quite different starting points in respect of their approach to vehicle taxation; and

3. Member States have freedom to determine their own approach to vehicle taxation (though the Commission's expressed wish is that registration taxes are phased out),

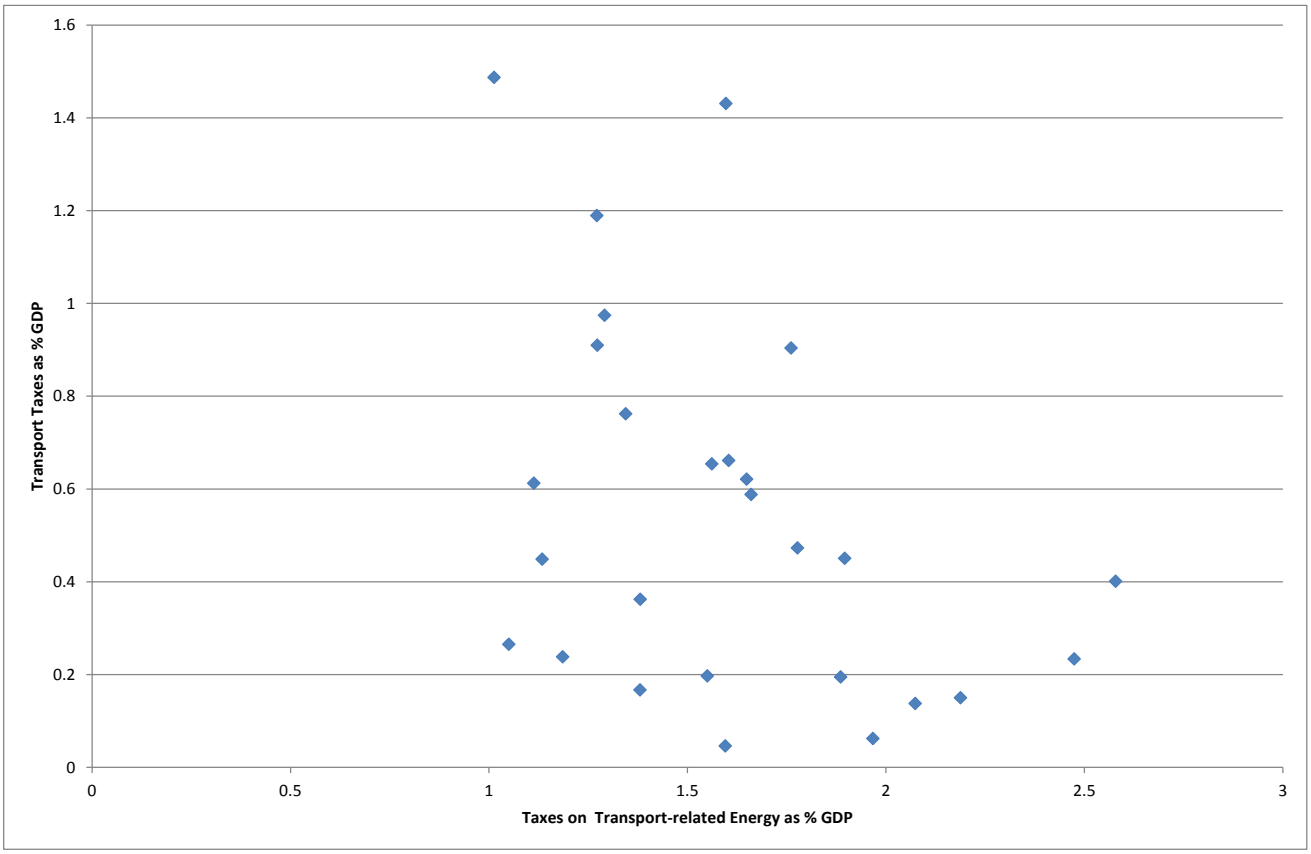
then we have taken a rather pragmatic approach to the application of good practice in this area.

In essence, we have reviewed the current level of tax associated with vehicles and transport fuels in the different countries and have proposed a change to this level in line with the difference in potential revenue take across countries relative to 'good practice'.

In terms of how these revenues are generated, the revenue coming from taxes on transport-fuels (covered under the Energy Tax Directive) is plotted against the revenue coming from transport taxes (excl. transport fuels) in Figure 13. This figure suggests two things:

1. First, a line of best fit shows a weak, but discernible, inverse relationship between the two (potentially bearing out the above point regarding the need to look at all transport taxes, including those on transport fuels, in the round: Member States with high taxes on transport fuels tend not to tax vehicles quite as heavily); and
2. Second, and possibly reflecting the influence of the existing Directive on taxation of energy products and electricity (2003/96/EC, as amended), no country raises less than 1% of GDP from taxes on transport fuels, irrespective of the rate at which it applies taxes on transport (excl. transport fuels). Consequently, whilst taxes on transport (excl. transport fuels) range from below 0.1% GDP to around 1.5% GDP, the taxes on transport fuels generate from around 1% to 2.5% GDP. The 'interval' between the lowest and highest levels (as % GDP) is similar for each (around 1.4% GDP), but the proportionate variation (expressed in terms of revenue as % GDP) is much greater where taxes on transport (excl. transport fuels) are concerned.

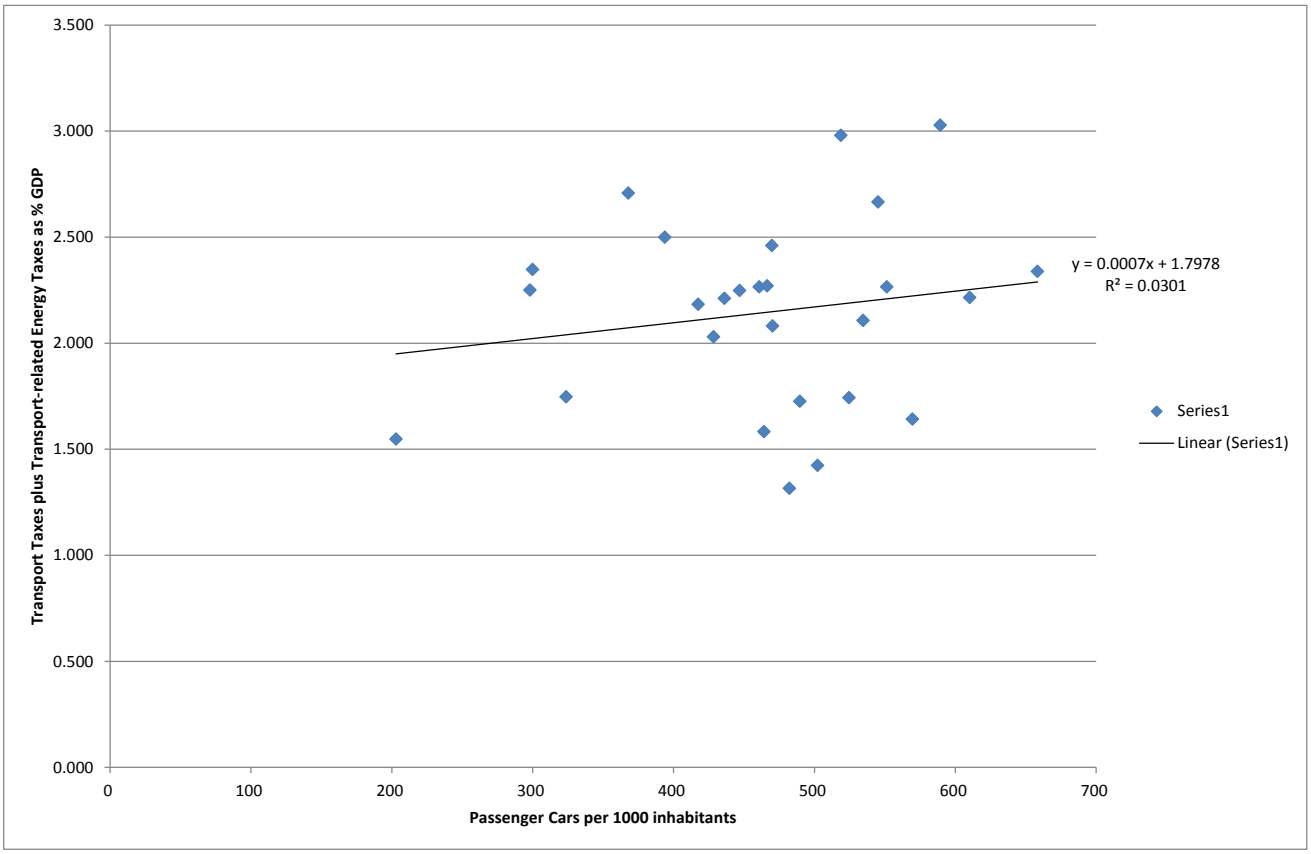
Figure 13: Transport-related Energy Taxes (as % GDP) v Transport Taxes (as % GDP) (EU27, 2011)



In determining an appropriate level of potential revenue generation which could be generated from transport taxes (excl. transport fuels), we first of all considered the overall revenue generation in the EU Member States from transport fuels and transport taxes (excl. transport fuels) together. The highest level of taxation from the sources combines was to be found, in 2011, in Malta (3.03% GDP), followed by Slovenia (2.98% GDP) and Bulgaria (2.71% GDP). Of the EU-15 countries, the highest level of revenue generation relative to GDP for these combined taxes was in Denmark (2.50% GDP). We took the average figure in the upper quartile of performance (2.67% GDP), and used this figure effectively as a revenue target to inform the extent to which a Member State could increase taxes on transport (excl. transport fuels) and transport fuels.

We considered that in moving towards this rate, where transport taxes are concerned, the potential for revenue generation might be limited by the level of passenger car use. We have plotted in Figure 14 the relation between passenger cars per 1,000 inhabitants and the total revenue from transport taxes and transport-related energy taxes (as % GDP). This appears to show only a weak influence of the one upon the other. Similarly weak correspondences are shown when considering only the transport taxes on the y axis, and when considering the total number of vehicles registered on the x-axis. We considered that the evidence was, therefore, too weak to consider this as a controlling variable.

Figure 14: Relationship between Transport Taxes plus Transport-related Energy Taxes (as % GDP) and Passenger Cars per 1000 Inhabitants (EU27, 2011)



Source: based on data from European Commission (2013) Transport in Figures 2013, Part 2: Transport, Directorate General for Mobility and Transport

By subtracting the current revenue take from the target level, a proposal for the level of change in taxes on transport (including transport taxes) is derived. The net result for the countries in this study is shown in Table 96. The change in the far column is a suggested minimum level of increase to transport taxes (including transport fuels).

In order to arrive at the suggested level of change in transport taxes (excl. transport fuels), the revenue take from transport fuels under our revised proposals (see above) has to be estimated first. Within our modelling, therefore, there is a sequential logic applied, whereby the change in transport taxes (excl. transport fuels) is derived by subtracting from the figure in the rightmost column of Table 96 the implied increase in the revenue take from transport fuels implied by the changes discussed in Section A.1.2.1.

Table 96: Suggested Minimum Increase in Transport Taxes plus Transport-related Energy Taxes

	Transport Taxes (incl. transport fuels) (% GDP, 2011)	Revenue Target (as % GDP)	Proposed Increase in Transport Taxes (incl. transport fuels) (as % GDP)
BE	1.73%	2.67%	0.94%
BG	2.71%	2.67%	-0.04%
CZ	2.21%	2.67%	0.46%
DK	2.50%	2.67%	0.17%
DE	1.74%	2.67%	0.93%
EE	2.03%	2.67%	0.64%

	Transport Taxes (incl. transport fuels) (% GDP, 2011)	Revenue Target (as % GDP)	Proposed Increase in Transport Taxes (incl. transport fuels) (as % GDP)
IE	2.18%	2.67%	0.49%
EL	2.27%	2.67%	0.40%
ES	1.32%	2.67%	1.35%
FR	1.42%	2.67%	1.25%
IT	2.22%	2.67%	0.45%
CY	2.67%	2.67%	0.00%
LV	2.35%	2.67%	0.32%
LT	1.64%	2.67%	1.03%
LU	2.34%	2.67%	0.33%
HU	2.25%	2.67%	0.42%
MT	3.03%	2.67%	-0.36%
NL	2.46%	2.67%	0.21%
AT	2.11%	2.67%	0.56%
PL	2.08%	2.67%	0.59%
PT	2.25%	2.67%	0.42%
RO	1.55%	2.67%	1.12%
SI	2.98%	2.67%	-0.31%
SK	1.75%	2.67%	0.92%
FI	2.27%	2.67%	0.40%
SE	1.58%	2.67%	1.09%
UK	2.27%	2.67%	0.40%

Source: European Commission (2013) Transport in Figures 2013, Part 2: Transport, Directorate General for Mobility and Transport, Tables 2.1.11 and 2.1.12

In terms of the types of taxes to be applied, the proposal for a Directive discussed above was considered, by the Steering Group, to be the latest publicly available view as to the European Commission's thinking on the matter of passenger vehicle taxation. The proposal expressed the Commission's preference for a shift away from registration taxes. As a result, we have tended to focus that the focus for the generation of additional revenue should be through circulation taxes. In this respect, and as noted above, we note that good practice is to band such taxes according to CO_2 emissions from the vehicle, though we note also that the approach in Malta (under its registration tax) to differentiating diesel vehicle tax rates according to particulate emissions is of some interest, with Denmark doing something similar with its circulation tax.

Finally, in terms of the timing of the introduction of any changes, we have typically suggested a phasing in of the changes over a period which relates to the magnitude of the change being proposed in the country concerned. The taxes are assumed to be phased in between 2015 and 2020, and increase in line with GDP thereafter. This would imply an increase over and above inflation to the extent that GDP is forecast to rise in real terms. It should be noted, in this regard, that some countries are already, in anticipation of a shift in the vehicle stock, and increased innovation in terms of fuel efficiency, reducing the level of CO_2 emissions from vehicles at which a zero rate of tax might apply (for example, in Germany, cars emitting less than 120g CO_2/km

are exempted from the CO_2-related part of the circulation tax: this tax free margin was decreased to 110g CO_2/km in 2012 and will be further reduced to 90g CO_2/km in 2014).[482]

[482] See Eclareon and Ecologic (2013) Horizontal Fiche: Environmental Taxation: Reporting of Task 2 and Task 3 as part of the Project 'Assessment of climate change policies in the European Semester, 21 April 2013.

A.1.4 Air Transport

A.1.4.1 Good Practice

Where air transport is concerned, some Member States deploy levies on passenger flights. Aviation emissions have been included under the ETS since the start of 2012, although in April 2013 the EU decided to temporarily suspend enforcement of the EU ETS requirements for flights operated in 2010, 2011, and 2012 from or to non-European countries, while continuing to apply the legislation to flights within and between countries in Europe. In October 2013 the International Civil Aviation Organization (ICAO) Assembly agreed to develop, by 2016, a global market-based mechanism (MBM) addressing international aviation emissions and apply it by 2020. Until then, countries or groups of countries, such as the EU, can implement interim measures.

Countries which are applying, or have applied duties include:

1. Germany, where the aviation tax has three distance bands, and were, in 2013, the tax rate was € 7.50 for short journeys, € 23.43 for medium distances and € 42.18 for long distances. The revenues raised amounted to 0.04% GDP in 2011, though the tax rates have been reduced since 2011;
2. France which applies two different rates for passengers, and one to freight: € 4.24 per passenger for a flight to a destination in France or in another Member State of the European Union or in another state in the European Economic Space agreement or in Switzerland; € 7.62 per passenger embarking for any other destination; and € 1.27 per tonne of freight or mail loaded onto an aircraft. The revenues raised amounted to 0.02% GDP;
3. UK, where the tax is levied at twelve different rates depending on the distance and class of travel. All countries are divided into four distance bands based on the distance between London and the capital city of that respective country/territory:
    - Band A: GBP 13 – for flights beginning in the UK and ending in the UK or any other country/territory for which the capital city is within 2000 miles of London.
    - Band B: GBP 67 – for flights beginning in the UK and ending in any country/territory for which the capital city is between 2001 and 4000 miles from London.
    - Band C: GBP 83 – for flights beginning in the UK and ending in any country/territory for which the capital city is between 4001 and 6000 miles from London.
    - Band D: GBP 94 – for flights beginning in the UK and ending in any other destination in the world.

    For each distance band, there are three rates of air passenger duty (APD); reduced, standard and higher, depending upon the class of travel (see Table 97). The reduced rates apply where the passengers are carried in the lowest class of travel on any flight unless the seat pitch exceeds 1.016 metres (40 inches), in which case, whether there is one or more than one class of travel the standard rates apply. The standard rates apply where passengers are carried in any class of travel other than the lowest or where the

seat pitch exceeds 1.016 metres (40 inches), unless the conditions for the higher rate below are met. The higher rate applies if passengers are carried on aircraft with an authorised take-off weight of 20 tonnes or more and equipped to carry fewer than 19 passengers. Note that a different structure applies for Northern Ireland flights. In 2011, the duty raised revenues amounting to 0.17% GDP;

Table 97: UK Air Passenger Duty Rates, 2012 and 2013

Destination Bands and distance from London (miles)	Reduced rate from: (for travel in the lowest class of travel available on the aircraft)		Standard rate from: (for travel in any other class of travel)		Higher rate from: (for travel in aircraft of 20 tonnes or more equipped to carry fewer than 19 passengers)	
	1 April 2012	1 April 2013	1 April 2012	1 April 2013	1 April 2012	1 April 2013
Band A (0-2000)	£13	£13	£26	£26	N/A	£52
Band B (2001-4000)	£65	£67	£130	£134	N/A	£268
Band C (4001-6000)	£81	£83	£162	£166	N/A	£332
Band D (over 6000)	£92	£94	£184	£188	N/A	£376
Note: if a class of travel provides for seating in excess of 1.016 metres (40 inches) then the standard or higher (rather than the reduced) rate of APD applies.						

4. Austria, which introduced a passenger flight charge in 2011, with rates being reduced in 2012. The tax has three bands, and rates applicable are:

   Short haul flight: €7.00 / passenger

   Medium-haul flight: €15.00 / passenger

   Long-haul flight: €35.00 / passenger

   The revenue take in 2012 was €107 million.

5. Malta, which abolished its flat rate tax (€23.29 per passenger) in 2008. The tax raised revenues amounting to 0.1-0.21% GDP in the years prior to its abolition;
6. Denmark, which abolished its duty of DKK 37.50 per passenger in 2007 (it had been half this level in 2005. The tax raised revenues of around 0.03-0.04% of GDP in the years just prior to abolition.

It should also be noted that some countries – the Netherlands and Italy for example – also levy charges related to aviation noise. In Italy, what was previously a national tax was made a regional one in 2011, with uneven implementation giving rise to some concerns. This is, clearly, a particular problem for households living adjacent to airports, or below major flight-paths.

It would appear that revenues of the order 0.15-0.2% of GDP may be raised where there is a higher propensity for air transport (as in Malta and UK, being island states). The revenue raising

potential may be slightly lower in countries where the potential for road and rail transport to and from other countries is greater.

It should be noted that a feature of the French system is that freight is also subject to taxation. This is, in principle, a sensible approach, especially to the extent that road, and other forms of freight are also subject to taxation. In principle, so as not to distort modal choice in a random manner, some objective basis for aligning taxes across the modes used should be deployed (for example, the implied costs of GHG damages should be aligned across modes, to the extent that this can be agreed).

A.1.4.2 Suggested Implementation

Although aviation is included in the EU-ETS, and EU Aviation Allowances (EUAAs) were introduced in January 2012, the European Commission announced, in 12 November 2012, a deferral of the enforcement of the requirements under the EU Emissions Trading System for aircraft operators to monitor and report emissions, as well as surrender allowances, in April 2013 for emissions from flights into and out of Europe during 2012. It had been envisaged that 15% of aviation allowances would be auctioned. Evidently, pending the introduction of a new instrument by the ICAO (which is due by 2020), there is scope for some additional revenue to be generated. Indeed, it is possible that the market based instrument introduced by the ICAO could provide a source of revenue to Member States (as would have been the case had the auctioning of EUAAs proceeded as planned). As such, it does not seem unreasonable to propose measures on flights which could be applied either as interim measures, or with more permanent effect.

Most countries with taxes in place are applying fairly coarse banding systems to simplify administration. A three tiered approach seems reasonable in the circumstances, though in principle, a means to link the tax more closely to emissions could be made through, for example, taxes on journeys made by the aircraft.

Our approach has been to assume that such taxes are introduced, commencing in 2015 and phased in over a period to 2017 reaching tax rates broadly reflecting the UK tax rates. As noted above, the ICAO is due to come forward with a proposed instrument for implementation by 2020. It may be that the instrument is such that it can effectively replace the duties indicated here. However, we assume continuation of these levies post 2020. If a mechanism such as a trading scheme was introduced globally, then depending on the nature of the allocation mechanism for allowances, some revenue would be generated through the auctioning of these. As such, the revenues from allowances might simply replace (to a greater or lesser degree) the suggested tax in future.

The data available to us splits out flights in accordance with whether they are:

1) Within the country concerned;
2) To other countries in the European Union; and
3) To other countries outside the European Union.

We have used this as a proxy for distance, though clearly, for most countries, a distance related levy would not be split as neatly as this breakdown suggests.

In addition, although the UK levy is applied in 3 bands, in practice, the main bands are the lower two, relating, broadly speaking, to lower and upper classes of travel. We have not obtained such a breakdown for each country so we have applied rates close to the lower rates. The rates applied are €15 per passenger, €25 per passenger and €50 per passenger for the different

types of flight are used to generate indicative revenues only. For countries with land borders with non-EU countries, it could be expected that flights to non-EU countries might be proportionately higher than for those more remote from non-EU countries. In addition, in line with the approach adopted in France, we have also suggested a tax of €1.25 per tonne of freight carried by air.

A.1.5 Waste

A.1.5.1 Good Practice

A number of countries have introduced landfill taxes.[483] The rates vary significantly across countries. The highest rate, for non-hazardous wastes, is in the Netherlands at over €107 per tonne (this tax was abolished, but then reinstated late in 2013). The rate of tax in the UK is also high, at around €90 per tonne in 2013, and due to increase to approximately €100 per tonne in April 2014). Some countries within the EU have also implemented landfill bans, which amount, effectively, to an infinite tax on landfilling of those wastes falling under the scope of the ban. Countries with landfill bans in place have tended (with the exception of Germany) to set high landfill taxes to ensure that those subject to the ban have no financial incentive to seek exemptions from the ban for local reasons (for example, the absence of appropriate treatment facilities).

Much of the literature on the externalities of waste management indicates that there is relatively little to choose between the quantifiable externalities arising from landfill and those arising from incineration.[484] Indeed, several studies have indicated externalities from incineration which exceed those from landfill. It is somewhat surprising, therefore, that taxes on incineration remain relatively rare.

They do exist in Denmark, Flanders in Belgium, Austria, France, Catalonia in Spain, and Portugal. Given the extent to which bans have given rise to over-capacity in treatment in most of the countries which have introduced them (Netherlands, Germany, Sweden, Denmark, Austria, Belgium), then a sensible approach – to encourage a shift away from landfill, but without encouraging a simple shift from landfill to incineration – would be to increase taxes on landfill, whilst also introducing taxes on other ways of treating residual waste so as to act as an incentive for waste prevention and further recycling, rather than encouraging a switch from disposal to landfill to combustion of residual waste. Indeed, this would be consistent with the Roadmap to a Resource Efficient Europe and the recently agreed 7th Environmental Action Programme.[485] The economic case for a landfill ban in the general case seems difficult to justify.

The way in which taxes are applied to non-municipal waste is also of some interest in the design of landfill taxes. A number of countries have considerable 'structure' in the design of their taxes, with some countries applying more than 10 different rates depending on the waste stream.

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[483] For a recent review, see ETC/SCP (2012) *Overview of the Use of Landfill Taxes in Europe*, ETC/SCP Working Paper 1/2012, April 2012, http://scp.eionet.eu; opa.eu/publications/WP2012_1/wp/WP2012_1 .

[484] HM Customs & Excise (2004) *Combining the Government's Two Heath and Environment Studies to Calculate Estimates for the External Costs of Landfill and Incineration,* December 2004; E. Dijkgraaf and H. Vollebergh (2005) Literature review of social costs and benefits of waste disposal and recycling, in EAI (2005) *Rethinking the Waste Hierachy*, EAI: Copenhagen, pp. 80-98; E. Dijkgraaf and H. Vollebergh (2004) Burn or bury? A social cost comparison of final waste disposal methods, *Ecological Economics*, 50, pp.233-247; COWI (2000) *A Study on the Economic Valuation of Environmental Externalities from Landfill Disposal and Incineration of Waste*. Final Report to DG Environment, the European Commission, August 2000.

[485] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

It is interesting that Member States with taxes in place treat construction and demolition wastes very differently. The UK includes a standard rate (currently at €90 per tonne) for most wastes, and a much lower rate (currently at €3 per tonne) for specified materials which are usually of a 'biologically inert' character. On the other hand, Latvia applies a much higher rate of tax for inert construction wastes than it does to municipal type wastes. Several countries levy the same rates of tax for both types of waste.

Another interesting aspect of landfill taxes is the way in which hazardous wastes are dealt with. In many countries, there is no special rate for hazardous wastes, whilst in some (France), the taxes are lower for hazardous waste than for municipal waste, whilst in others, they are much higher. In this latter regard, the case of the Czech Republic is interesting given the imposition of both a tax and a risk charge, revenue from the latter being given over to the State Environmental Fund.

A.1.5.2 Suggested Implementation

A recent report for DG Environment highlighted the role of landfill taxes in incentivising improved waste management performance:[486]

> *The analysis suggests that there is a relationship between higher landfill taxes (and higher total landfill charges) and lower percentages of municipal waste being sent to landfill. Three broad groups of MS emerge:*
>
> *1. MS with high total charges for landfill and low percentages of municipal waste landfilled (AT, BE, DE, DK, LU, NL, SE);*
>
> *2. MS with mid- to high-range total charges and mid-range percentages landfilled (FI, FR, IE, IT, SI, UK); and*
>
> *3. MS with low total charges and high percentages landfilled (BG, CZ, GR, HU, LT, LV, PL, PT, RO, SK, CY, EE, ES). All except the last three of these MS have total landfill charges of less than €40 and are landfilling more than 60% of their municipal waste.*
>
> *The MS in group 1 all have some form of landfill restriction in place for unsorted or untreated municipal waste; several of the MS in group 2 also have landfill restrictions in place for unsorted or untreated municipal waste; and only EE, SK and LT in group 3 currently have or are planning to introduce such restrictions. It is reasonable to believe that in addition to the taxes and total charges, these restrictions also have an influence on forcing landfill rates down to low levels.*

It went on to note:[487]

> *A fairly clear and linear correlation was observed between the total landfill charge and the percentage of municipal waste recycled and composted in the MS. The MS that charge more for landfilling show a higher percentage of MSW recycled and composted. Evidently, other policies (including those to promote recycling, to encourage prevention,*

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[486] E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf , p.4.

[487] E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf , p.4.

extended producer responsibility schemes and PAYT schemes) also influence recycling and composting rates, but it appears reasonable to state that in addition to simply reducing the amount of waste sent to landfill, higher landfill charges tend to push waste towards recycling and composting, therefore moving waste treatment up the waste hierarchy. It appears that MS are much more likely to meet a 50% recycling target once landfill charges (or the cost of the cheapest disposal option) approach €100 per tonne.

In reality, the rate of tax to be set depends partly on the objectives for the tax. To the extent that waste is to be moved up the hierarchy, then it should be considered that the gap between the costs for recycling and the costs of landfilling are likely to be influenced by a range of factors, not least, the labour costs in the country concerned.

The above study indicates, however, that broadly speaking, a tax of less than €40 per tonne might not be sufficient to stimulate significant change in performance. Equally, for a number of countries, the rate of €100 per tonne suggested as necessary to achieve 50% recycling would impose significant costs to many of the countries in this study.

It should also be noted that many Member States have made use of funds from the European Union to fund treatment facilities dealing mainly with residual waste. Some concerns have arisen regarding the fact that this might lead to a stitch of material from landfill to incineration with limited movement of waste management into the upper tiers of the waste hierarchy.

The suggested approach is based upon moving tax rates for landfilling to a level of €50 per tonne, and indexing rates once they are at this level. The implementation of major changes in landfill tax in short periods of time without prior announcement can be problematic in a sector which is characterised by long lead times. As such, the implementation is phased, with the €50 rate being met in a number of years, depending on the current level of tax in the country concerned.

In order to ensure landfill taxes generate movement of waste into upper tiers of the hierarchy, it is also suggested that a tax is implemented on incineration. Although Denmark has a much higher tax rate for incineration (and this is now related to CO_2 emissions), the suggestion is that rates similar to those in France would be appropriate. The tax rate proposed is €15 per tonne, with the rate being phased in so that it is achieved in the same year as the landfill tax proposed above.

For Austria and Belgium, no amendment in landfill tax is proposed given the ban on landfilling in Austria and the Flemish and Walloon regions of Belgium.

As regards inert (construction type) wastes, for countries with no such tax in place at present, it is suggested the tax is set at €2.40 per tonne. In conjunction with aggregates taxes, such taxes can help to encourage recycling of construction wastes for use as secondary aggregates, but experience indicates the tax does not have to be especially high (and where it is, it may give rise to problems of poor management of such wastes).

These approaches give some time for response by industry (which is already changing in most of these countries). The taxes on both landfill and incineration / MBT are designed to encourage approaches more focused on the upper tiers of the waste hierarchy. In some countries, there is, as yet, no incineration, but a tax, even at a low rate, can serve to indicate the desired direction of travel in future, and present over-investment in incineration capacity (which is particularly easy to do in some of the smaller Member States). Hence, the early announcement of such a tax is designed to forestall excessive investment in such infrastructure in future years. It is assumed

that the taxes are indexed to inflation (they stay constant in real terms) for the purposes of the revenue calculation. In practice, this may happen through annual indexing or through periodic adjustments.

A.1.6 Packaging

A.1.6.1 Good Practice

Where packaging taxes are concerned, databases frequently record taxes which are either a) not taxes, or b) only applied in limited circumstances. This is due, mainly, to the existence of producer responsibility organisation which have been established as part of countries' response to the packaging and packaging waste Directive, and which themselves (typically) require producers to pay a fee to ensure their packaging obligations are discharged. Some taxes may relate to these schemes, whilst some are used, in essence, as inducements to join such schemes since they are paid only by organisations that choose not to discharge their obligations through such schemes. Several countries apply such taxes in the latter form, including (within the group of countries we are interested in), for example, Lithuania. The DG-TAXUD database records the tax on packaging as part of Lithuania's scheme of environmental taxes. The applicable rates are shown in Table 98.

Table 98: Packaging Tax Rates in Lithuania

Types of packaging	Rates (LTL per kilogram of the weight of the packaging)
1. Glass packaging	0.20
2. Plastic packaging	1.80
3. Composite packaging	2
4. Metal packaging	2.60
5. Paper and carton packaging	0.10
6. Other packaging	0.20
7. PET packaging	2

The description in the DG-TAXUD database states

> *Manufacturers and importers are exempted from the pollution tax for polluting the environment with goods and/or packaging waste proportionally the recovered and/or recycled amount of goods and/or packaging waste.*
>
> *If manufacturers and importers fulfil the tasks set for recovery or recycling of goods and packaging waste they are fully exempted from this tax paying.*

In our experience, few organisations will choose to 'self-comply' so that revenues from such taxes will be extremely limited as the implied rates are effectively punitive. For this reason, we concentrate on those taxes which are not linked to (non-)compliance with recycling obligations.

Another tax which has links to other packaging instruments is the tax in Finland. This is applied to warehouse keepers, and other persons who import packaged beverages from outside the Union or receive them in the course of their business activities from another Member State.

However, there are exemptions for packaging which belongs to a deposit refund system and are recoverable within such a scheme or as raw material. The relevant deposit system has to be approved by the environmental authorities. Also exempt are liquids in board packaging (presumably, since Finland does not include such packaging in the scope of its own deposit refund scheme, operated by Palpa). Beverages produced in legally and economically independent small manufacturers are also exempt, when the amount of beverages released for consumption does not exceed 50,000 litres. The applicable rate is 51 cents/litre of packaged product. The tax raised €15 million in 2011, equivalent to 0.01% GDP.

Denmark has had a packaging tax in operation since 1978, and despite generally favourable reviews, it has recently been abolished. Significant changes to the tax were made over the last fifteen years or so.[488] Between 1999 and 2001, Denmark introduced a more sophisticated version of the tax which removed fiscal equality between different packaging materials. The revised taxes are now determined through reference to life cycle-based assessment of the environmental damages associated with the different materials. In Denmark, the tax was implemented for a variety of objectives including:

- Waste prevention;
- Higher rates of recycling; and
- Reduced environmental / climate change impacts.

Not all packaging was covered within the scheme. The levy does not cover other items such as general foodstuffs and household goods and only applies to retail containers up to 20 litre capacity (see Table 99). One report suggests that only 7% of packaging was covered by the tax.[489] The tax was weight based for a wide range of products. The rate varied depending on the material used, and there are 13 different tax levels, corresponding to the different types of materials. For drinks containers, the tax was levied per unit. This was partly in acknowledgement of the fact that reusable packaging, used in the Danish deposit refund system, is heavier, and to base the tax on weight would have penalized the use of reusable containers. In any event, a report states that:[490]

> *If there is no obligatory deposit on the beverage, the tax rate depends on the material used and the volume of the beverage. If the material is made of cardboard or of laminate there is a single rate and if it is made from other materials such as glass, metals, plastic etc. there is a higher rate per unit (Danish Ministry of Taxation, 2011).*
>
> *If there is an obligatory deposit on the beverage, the tax rate is not influenced by the material used, and the rate is lower than for beverage packaging not subject to a deposit.*

Table 99 demonstrates the tax rates on packaging material that were applied in Denmark.

---

[488] ECOTEC in association with CESAM, C. U. (2001) *Study on Environmental Taxes and Charges in the European Union and its Member States,* Final report for the European Commission, April 2001.

[489] ETC / SCP (2012) Effectiveness of Economic Instruments for Packaging, ETC / SCP Working Paper No.4 / 2012, December 2012, http://scp.eionet.europa.eu/publications/wp2012_4/wp/wp2012_4 p.26.

[490] Ibid, p.27.

Table 99: Primary Packaging Tax Rates in Denmark, 2008 (weight-based)

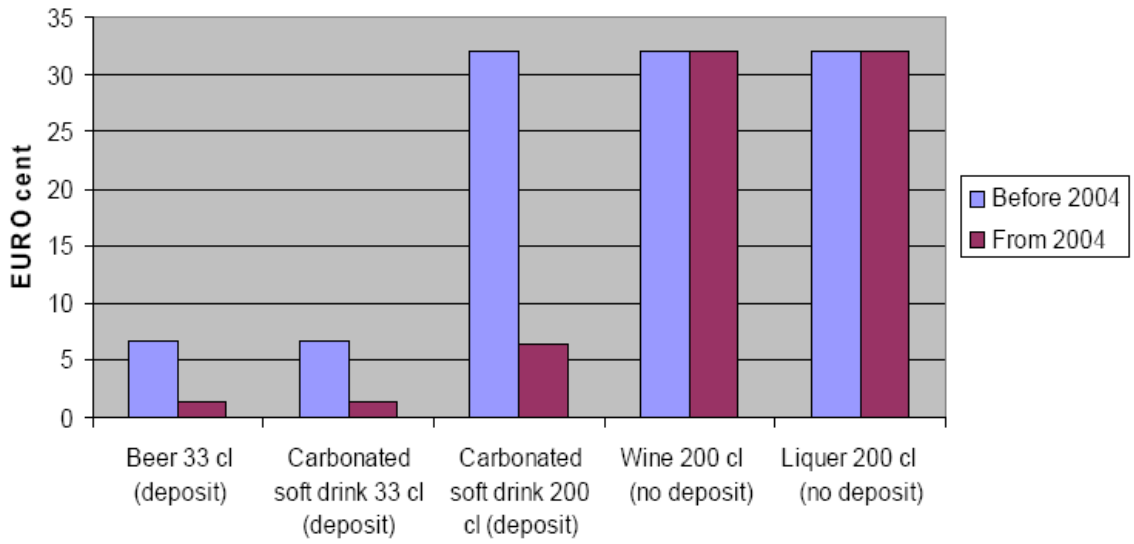
Volume-based tax		
A. Packaging and multi-packaging with a cubic content of not more than 20 litres for:		Per Item
Spirits, wine and fruit-wine;	- Cardboard or laminates of various materials: **per item**	
	containers with a capacity of less than 10 cl	DKK 0.08
	containers with a capacity of not less than 10 cl and not more than 40 cl	DKK 0.15
	containers with a capacity of not less than 40 cl and not more than 60 cl	DKK 0.25
	containers with a capacity of not less than 60 cl and not more than 110 cl	DKK 0.50
	containers with a capacity of not less than 110 cl and not more than 160 cl	DKK 0.75
	containers with a capacity of above 160 cl	DKK 1.00
	- Other materials:**per item**	
	containers with a capacity of less than 10 cl	DKK 0.13
	containers with a capacity of not less than 10 cl and not more than 40 cl	DKK 0.25
	containers with a capacity of not less than 40 cl and not more than 60 cl	DKK 0.40
	containers with a capacity of not less than 60 cl and not more than 110 cl	DKK 0.80
	containers with a capacity of not less than 110 cl and not more than 160 cl	DKK 1.20
	containers with a capacity of above 160 cl	DKK 1.60
Beer, mineral water, lemonade and similar beverages containing carbonic acid, falling under customs tariff items 22.01 and 22.02, blends of non-alcoholic drinks with spirits with an alcohol content of no more than 10% vol.;		Per Item

	containers with a capacity of less than 10 cl	DKK 0.05
	containers with a capacity of not less than 10 cl and not more than 40 cl	DKK 0.10
	containers with a capacity of not less than 40 cl and not more than 60 cl	DKK 0.16
	containers with a capacity of not less than 60 cl and not more than 110 cl	DKK 0.32
	containers with a capacity of not less than 110 cl and not more than 160 cl	DKK 0.48
	containers with a capacity of above 160 cl	DKK 0.64
Weight-based tax		
B. Packaging and multi-packaging of any other material and volume used for:		Per kg
Mineral water, lemonade and similar beverages not containing carbonic acid, falling under customs tariff items 22.01 and 22.02, juice and must and concentrates used for the production of such drinks;		
Water;		
Vinegar and edible oil;	cardboard and paper primary material and textiles	DKK 0.95
Denatured spirits;	cardboard and paper secondary material	DKK 0.55
Soap, detergents, cleansing agents and cleaning preparation, polish and similar goods falling under customs tariff items 34.01, 34.02 and 34.05;	plastic (except eps and pvc), primary material	DKK 12.95
	plastic (except eps and pvc), secondary material	DKK 7.75
Lubricant and similar goods falling under customs tariff item 27.10, 38.19 and 34.03 and goods liable to tax according to law of energy tax on mineral oil, etc;	plastic (except eps and pvc), UN-approved	DKK 10.35
	plastic (except eps and pvc) where more than 50% of the packing materials are different from plastic	DKK 7.75
Pesticides liable to tax according to law of tax on pesticides;	eps and pvc	DKK 20.35
Paint, lacquer, dye, stopper and similar goods falling under customs tariff items 32.08-32.10 and 32.14;	Aluminium	DKK 33.30
Perfume, cosmetics and similar goods falling under custom tariff items 33.03-33.07;	tinplate and other packings of steel	DKK 9.25
	tinplate and other packings of steel, UN-approved	DKK 7.40
Coolant for engines and windscreen wash;	glass and ceramics	DKK 1.85
Certain chemical substances and products falling under statutory order No 329 of 16 May 2002 from the Ministry of the Environment and Energy;	Wood	DKK 0.55
Milk and dairy products falling under customs tariff items 04.01-04.03 and 04.05 except for liquid whole milk, light milk, skimmed milk and buttermilk and the vegetable replacement of these products;		

Margarine and similar goods falling under customs tariff item 15.17 and other lubricate products consisting of a mixture of milk fat and vegetable fat falling under customs tariff item 21.06;		
Dog food and cat food falling under customs tariff item 23.09.10;		
Sauce, mustard and similar goods falling under customs tariff item 21.03 and tomato purée and tomato juice falling under customs tariff item 20.02.		
C. Plastic or paper bags with a cubic content of not less than five litres.	Paper bags Plastic bags	DKK 10 per kg DKK 22 per kg
D. Disposable tableware.		DKK 19.20 per kg
E. Film wrapping product of soft polyvinyl chloride (pvc) used for wrapping foodstuff.		DKK 20.35 per kg

The rates for beverage packaging in Denmark implied by the above levies are shown in Figure 15.

Figure 15: Tax on Beverage Packaging in Denmark



Source: Christian Fischer (2008) Producer Responsibility Schemes versus Deposits and Taxes- Danish Experiences, PRO Europe Congress, 15 May 2008

Due to the nature of the levy and its connection with consumption, the primary environmental outcome of the levy was anticipated to be waste prevention. According to the Nordic Council, the tax on packaging in Denmark led to an annual reduction of packaging of 400,000 tonnes. [491] It was designed to complement other existing market-based instruments, in particular, the deposit refund scheme for drinks containers.

The Danish scheme is considered by many to be successful. Success factors for the system are:

- Good coverage of materials covered by the tax;
- A switch from weight based taxation to LCA tax; and
- Tax levels set high enough to have an impact.

In 2011, the tax raised DKK 1.3 billion, or 0.07% GDP. This appears to include the revenue from taxes on plastic bags, disposable tableware, and PVC film used to wrap foodstuffs. A recent study suggests the following revenues from the packaging tax itself.[492]

[491] The Nordic Council (2008) *Extension of environmental taxes,* consulted October 2008 http://www.norden.org/webb/news/news.asp?id=6237

[492] ETC / SCP (2012) Effectiveness of Economic Instruments for Packaging, ETC / SCP Working Paper No.4 / 2012, December 2012, http://scp.eionet.europa.eu/publications/wp2012_4/wp/wp2012_4 p.29.

Table 100: Revenues from Danish Packaging Tax

	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Revenue mill.	DKK	437	436	447	423	448	474	460	394[1]	413[1]
% of 2002	100	100	102	97	103	108	105	90[1]	95[1]	
GDP index	100	100	103	105	109	111	110	104	-	
Final consumption index	100	101	105	108	111	114	114	-	-	

Note:

1) *On 1 December 2008, packaging for mineral water was transferred to the volume based packaging tax due to their inclusion in a deposit refund system.*
Source: Danish Ministry of Taxation, Eurostat

A.1.6.2 Suggested Implementation

In countries without deposit-refund systems, the distinction which is made in the Danish system makes rather less sense. The Danish weight-based rates could, in principle, be applied to all packaging, but as noted above, the tax has never covered more than a relatively small fraction of all packaging placed on the market. Applying the Danish weight-based rates to all packaging across the EU would imply a significant revenue take.

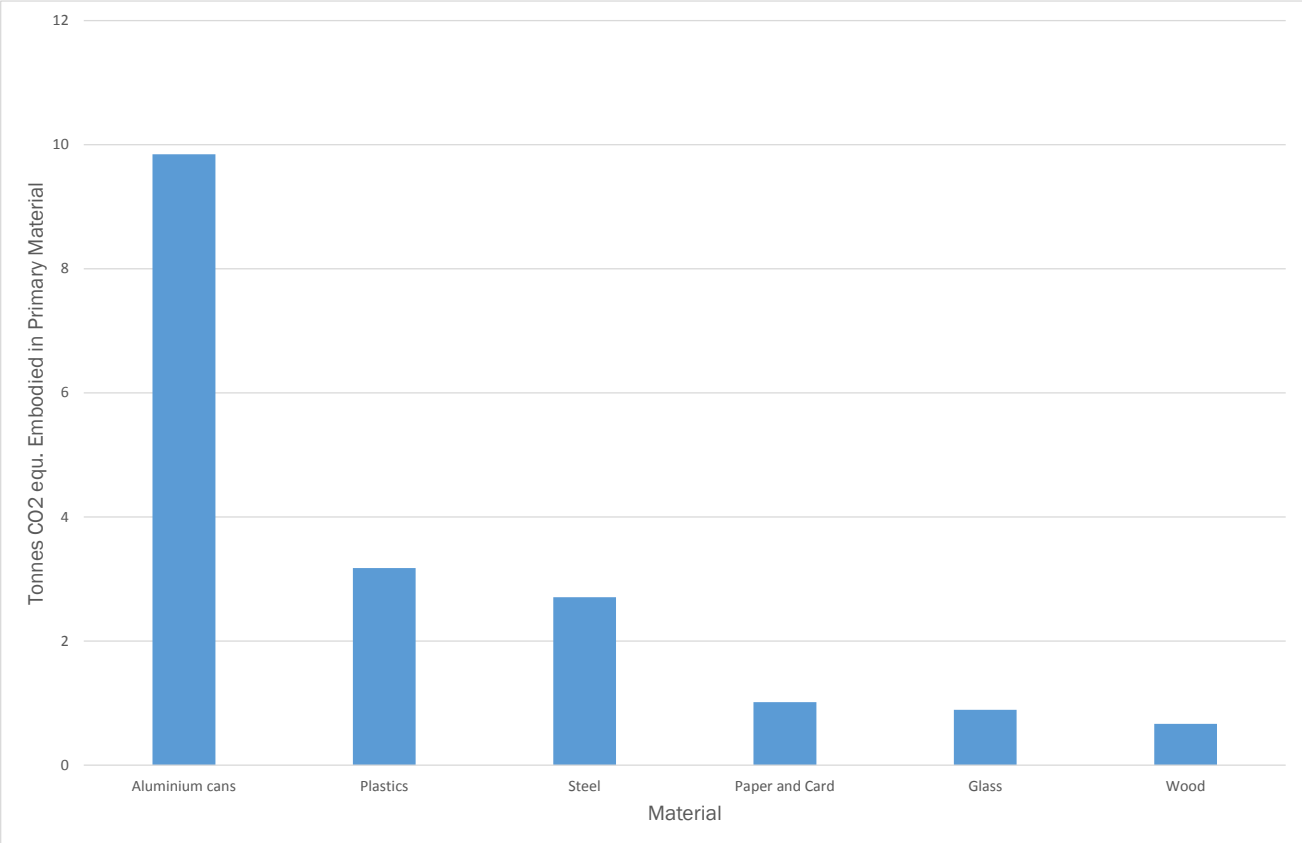
Table 101: Weight-based Packaging Tax Rates in Denmark (€/kg)

Material	Tax (€/kg)
Paper and Cardboard (primary)	€0.13
Paper and Cardboard (secondary)	€0.07
Plastic (except EPS and PVC) (primary)	€1.74
plastic (except EPS and PVC) (secondary)	€1.04
plastic (except EPS and PVC), UN-approved	€1.39
plastic (except EPS and PVC) where >50% of materials not plastic	€1.04
EPS and PVC	€2.73
Aluminium	€4.46
Tinplate and other steel packaging	€1.24
Tinplate and other steel packaging, UN approved	€0.99

Material	Tax (€/kg)
Glass and ceramics	€0.25
Wood	€0.07
Note: converted at exchange rate of €1 = DKK 7.46	

The fact that these figures are relatively high can readily be appreciated from the magnitude of the greenhouse gas savings from avoiding the use of primary materials of the different types commonly used in packaging. They are shown in Figure 16 below.

Figure 16: Embodied Greenhouse Gas Emissions in Specific Materials (tonnes CO_2 equ. per tonne of primary material)



Source: based on Zero Waste Scotland carbon metric

If one assumes (as per the proposed ETD) a value of €20 per tonne CO_2, these figures can be translated into a tax rate for each material as shown in Table 102.

Table 102: Weight-based Packaging Tax Rates Based on Embodied CO_2 Content (€/kg)

Material	Tonnes CO_2 Embodied in Material	€/tonne of material
Aluminium	9.84	€196.88
Plastics	3.18	€63.57
Steel	2.71	€54.16
Paper and Card	1.02	€20.35
Glass	0.89	€17.89
Wood	0.67	€13.32

These are the rates we have suggested are applied in those countries without similar measures already in place. The tax was modelled as being introduced in 2016. It is expected that a reasonable period of time would be required for discussions around such taxes prior to their being implemented.

A.1.7 Single-use Carrier Bags

A.1.7.1 Good Practice

At one level, the taxing of single-use carrier bags looks 'trivial' from the point of view of both revenues and environmental impact. By weight and by volume, they account for a very small proportion of the waste stream. However, the environmental impact of such bags, particularly plastic bags, is disproportionately large.

Plastics dominate marine litter and represent a significant threat to the marine environment due to their abundance, longevity in the marine environment and their ability to travel vast distances.[493] Despite representing only 10% of all waste produced, plastics account for between 50-80% of marine litter and this is not expected to decline for the foreseeable future (particularly as plastics do not degrade quickly).[494] As they are lightweight and long-lasting, and able to travel great distances, plastics are reported to present a long term threat to marine ecosystems, as they can:

- Directly harm wildlife: [495]
- Damage benthic environments; [496]
- Transport non-native and invasive species; and [497]
- Concentrate toxic chemicals from seawater. [498]

Of all plastics, it is, arguably, single use plastic carrier bags that have the greatest impact. Data taken from the International Bottom Trawl Survey and the Clean Seas Environmental Monitoring Programme indicate that plastic bags make up 40% of all

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[493] KIMO (2010) Economic Impacts of Marine Litter, Kommunernes Internationale Miljøorganisation Local Authorities International Environmental Organisation, September 2010, available at http://www.kimointernational.org/Portals/0/Files/Marine%20Litter/Economic%20Impacts%20of%20Marine%20Litter%20Low%20Res.pdf

[494] Thompson, R.C., Swan, S.H., Moore, C.J. and vom Saal, F.S. (2009a) Our Plastic Age. Philosophical Transactions of the Royal Society B: Biological Sciences 364(1526): 1969-2166; Barnes, D.K.A., Galgani, F., Thompson, R.C. and Barlaz, M. (2009) Accumulation and fragmentation of plastic debris in global environments. Philosophical Transactions of the Royal Society B: Biological Sciences 364(1526): 1985-1998; Thompson, R.C., Moore, C.J., vom Saal, F.S., and Swan, S.H. (2009b) Plastics, the environment and human health: current consensus and future trends. Philosophical Transactions of the Royal Society B: Biological Sciences 364(1526): 2153-2166.

[495] Sheavly, S.B. (2005) Marine Debris – an Overview of a Critical Issue for Our Oceans. Presentation at Sixth Meeting of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea. Available at http://www.un.org/Depts/los/index.htm

[496] Moore, C.J. (2008) Synthetic polymers in the marine environment: a rapidly increasing, long-term threat. Environmental Research 108: 131-139.

[497] Cheshire, A.C., Adler, E., Barbière, J., Cohen, Y., Evans, S., Jarayabhand, S., Jeft ic, L., Jung, R.T., Kinsey, S., Kusui, E.T., Lavine, I., Manyara, P., Oosterbaan, L., Pereira, M.A., Sheavly, S., Tkalin, A., Varadarajan, S., Wenneker, B. and Westphalen, G. (2009) UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. UNEP Regional Seas Reports and Studies, No. 186; IOC Technical Serious No. 83.

[498] Committee on the Effectiveness of International and National Measures to Prevent and Reduce Marine Debris and Its Impacts, National Research Council, Ocean Studies Board and Division on Earth and Life Sciences (2008) Tackling Marine Debris in the 21st Century. Washington D.C.: The National Academies Press.

marine litter in the waters of the North East Atlantic. The French research institute IFREMER has also found that in the Bay of Biscay most of the waste items found on the seabed were plastic (92%) and of those 94% were plastic bags.[499] An increasing area of concern is the potential impact of microplastic particles, although the environmental significance of this form of pollution is not yet fully understood. [500]

The need for action on single-use plastic carrier bags was further emphasised in 2013 when the European Commission published three studies looking into the composition and sources of marine litter in European seas. In a chapter integrating the results it noted that:[501]

> *Plastics are the most abundant debris found in the marine environment and comprise more than half of marine litter in European Regional Seas. More than half of the plastic fraction is composed of plastic packaging waste with plastic bottles and bags being predominant types of plastic packaging.*
>
> *Therefore, measures within a strategy to close the largest loopholes in the plastic packaging cycle should target plastic bottles and plastic bags.*

Accordingly, a more considered perspective leads one to the view that the application of such taxes – which have proved successful in radically reducing single-use carrier bag use – should be one of the key policies by which Europe addresses the problem of marine litter. It is worth noting that this issue is a growing concern and has led to various initiatives within the European Commission[502] as well as initiatives in coastal areas of the EU.[503]

However, while there is clearly merit in addressing *plastic* bags, there is a more compelling logic to placing a tax on *all kinds* of single-use carrier bags, whatever their material. Such an approach would avoid the inevitable arguments about the relative impacts of paper versus plastic (including biodegradable plastic) bags - arguments which, we note, are often conducted through the relatively restricted lens of life cycle assessment, typically excluding from consideration the 'downstream' impacts of such items when they become littered (which, as noted above, might be decisive in terms of any decision in respect of relative impacts).

Moreover, applying a tax to *all* single-use carrier bags would more fully respect the waste hierarchy, and lead to a greater waste prevention impact. Furthermore, in terms of

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[499] Seas at Risk (2011) Commission Consults on Binning Plastic Bags, available at http://www.seas-at-risk.org/news_n2.php?page=408

[500] T Thompson, R.C., Olsen, Y., Mitchell, R.P., Davis, A., Rowland, S.J., John, A.W.G., McGonigle, D. and Russell, A.E. (2004) Lost at Sea: Where is all the Plastic? Science 304: 838.

[501] See http://ec.europa.eu/environment/marine/pdf/Integration%20of%20results%20from%20three%20Marine%20Litter%20Studies.pdf

[502] See http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/index_en.htm

[503] The Conference of Parties of the Barcelona Convention for the Protection of the Mediterranean adopted a regional plan to manage marine litter in December 2013 (http://europa.eu/rapid/press-release_MEMO-13-1110_en.htm).

communication, applying a tax in such a way enables the delivery of a clearer and more intellectually coherent message to citizens. This is exemplified by the Welsh Government's implementation of the Carrier Bag Charge, which also demonstrates best practice by having the charge at the point of sale, rather than absorbed by the retailer.

Several countries apply carrier bag taxes.

In France, a tax under the TGAP is levied on plastic bags delivered in supermarkets. The rate of the tax is € 10 per kilogramme. In Denmark, there is a **weight-based carrier bags charge** (for bags made of paper and plastic, and having a handle). The tax is charged to manufacturers and suppliers (importers) on a per kg basis on plastic and paper bags with a greater than 5-litre capacity and which can be replaced by alternatives. Charging by weight encourages greater resource efficiency and less waste. These charges in most cases are passed on by retailers to their customers, in charging for plastic bags or selling a range of re-usable bags. The tax is charged at the equivalent of 2.95 EUR per kg of plastic bags and 1.34 EUR per kg for paper bags. The initial effect was dramatic, with a 60% fall in shopping bag use experienced. Bag use in Denmark is considerably below the EU average, with 80 bags used per person per year compared to the EU average of 500. Tax revenues from the shopping bag tax were estimated in 2007 at 26.6 million EUR and these have increased each year as bag use has crept up. Revenues are understood to go to general public budgets.[504]

However, it is worth noting that charging manufacturers and suppliers by weight may encourage a shift from paper to plastic, and indeed incentivise the production of thinner plastic bags. Whilst, from a resource efficiency perspective, such 'light weighting' may be desirable, this does not lessen the impacts if such bags become littered (indeed in some cases it may actually increase the impact, e.g. in respect of ingestion by marine fauna). Additionally, the Danish charge was not passed on to customers in all cases, thus reducing the effectiveness of the measure.

The Welsh Government introduced a £0.05 (€0.06)[505] compulsory charge for all single-use carrier bags at the point of sale in October 2011. Unlike Ireland this mechanism is not a levy, but a minimum charge that retailers are guided to pass on to local and environmental causes (although this is not mandatory).[506] Additionally it also applies to all single-use bags including those composed of paper and other plant based material, not just plastic.

Nine months after the introduction of the charge, reductions are cited by Welsh Government as between 70% and 96%, depending upon the sector.[507] Retailers in the following sectors reported a range of reductions:

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[504] Ecorys, CambridgeEconometrics, COWI (2011); The role of market-based instruments in achieving resource efficiency; http://ec.europa.eu/environment/enveco/taxation/pdf/role_marketbased.pdf

[505]Based on a £:€ exchange rate of 1:1.27650, ft.com currency converter, 26th July 2012.

[506] Welsh Government (2012), Carrier Bag Charge Wales, Accessed 19th July 2012. http://www.carrierbagchargewales.gov.uk/?lang=en

[507] *Welsh Government (2012),* Reduction in Single-use Carrier Bags, *Accessed 7th August 2012.* http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/substance/carrierbags/reduction/

- Food retail – between 96% and 70% reductions;
- Fashion – between 75% and 68% reductions;
- Home improvement – 95% reduction;
- Food service – up to 45% reduction;
- Telecommunications – 85% reduction.

Data released by WRAP in 2011 shows a reduction of 22% in usage across supermarkets in Wales from 2010 to 2011.[508] This would appear to be consistent with the reductions noted by the Welsh Government, bearing in mind that the charge was only in place for the final three months of 2011.

A study produced for The Welsh Government by Cardiff University conducted surveys both before and after the introduction of the charge regarding attitudes and behaviours towards it in England and Wales.[509] Results show that the charge has helped to increase greatly own bag use in Wales with a 21% increase in consumers taking a reusable bag to the supermarket (increased from 61% to 82% of the sample). This also illustrates the scale of reusable bag use prior to the charge which was also confirmed at a similar level of approximately 60.5% in England. The study however, does not consider the effect of the previous UK voluntary agreement in the baseline figures, which would be expected to have influenced use of reusable bags. The magnitude of the change associated with the implementation of a charge might be expected to be greater in nations with no such agreement already in place, but with a similar 'end point' in terms of uptake.

The Welsh Regulatory Impact Assessment[510] assumed that a 199% increase in demand for reusable bags would occur based on a levy charge of £0.07 (€0.09)[511], cited from a study commissioned for the Welsh Assembly Government by AEA Technology plc on single-use bags.[512] No supporting rationale for this figure can be gained from reviewing the AEA report and it seems to be slightly at odds with the *Cardiff University* study highlighted above which noted a relatively high level of pre-existing use of reusable bags.[513] Indeed, such a change would, most likely, not have been possible given the pre-existing level of use.

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[508] WRAP (2012), UK Supermarket Retailers Voluntary Carrier Bag Agreement: 2011 Carrier Bag Use, Presentation for the WRAP website, WRAP July 2012

[509] Poortinga et al (2012), Evaluation of the Introduction of the Single-Use Carrier Bag Charge in Wales: Attitude and Behavioural Spillover, Report for the Welsh Government, Cardiff University 2012.

[510] Welsh Assembly Government (2010), Proposals for a Charge on Single Use Carrier Bags: Regulatory Impact assessment, Welsh Assembly Government May 2010.

[511] Based on a £:€ exchange rate of 1:1.27650, ft.com currency converter, 26th July 2012.

[512] AEA Technology plc (2009), Welsh Assembly Government, Single Use Bag Study: Final, Report for the Welsh Assembly Government August 2009.

[513] This may be due to the voluntary agreement on carrier bags between UK Governments and a number of supermarkets.

Table 103 summarises the impacts of single-use bag levies introduced in Belgium, Italy, Ireland and South Africa. From this Table it is evident that levy's on single-use bags have had a marked, if not always long-lasting, effect on demand. It might be supposed that households may have 'a stock' of single-use bags which they use for various purposes (bin liners etc.). It may be that consumption of single-use bags increases as this stock is drawn down.

Table 103: Examples of Taxes on Plastic Carrier Bags and Their Impact on Consumption

Rate of Tax	Consumption trends	Impacts on litter
Belgium, April 2007[1,2]		
€3.00 per kg of plastic bags (1 to 10 cents per bag, depending on weight)	Reduction in sales of 80% between 2003 and 2009	n/a
Ireland, March 2002[3]		
Initially €0.15, but raised to €0.22 per plastic bag in July 2007	Consumption decreased by over 90%, from 328 bags per capita prior to the levy, to 21 the year after (this increased to 30 units per capita prior to the price increase in 2007)	Plastic bag litter reduced from 5% of total litter (estimated figure) in 2001 to 0.25% in 2010
Italy, 2002[4]		
Initially €0.13, but raised to €0.20 per plastic bag in 2007	Use of plastic bags decreased from 1.3 billion prior to the tax to 20 million units the year after (consumption then began to increase to 140 million units per annum)	n/a
South Africa· May 2003[5]		
Initially ZAR 0.46 (€0.04) for standard 24L bags, but subsequently decreased as retailers have absorbed the costs (retailers are liable for the tax)	For high-income earners consumption of plastic bags per ZAR 1,000 worth of shopping (€92 on 22 September 2011) has decreased by approximately 57% and for low-income earners the reduction has been approximately 50%. There was an initial sharp drop in demand, but this was soon reversed	According to the cited paper, no pre or post levy data exists on litter levels in South Africa

Notes:

1. Pre-Waste (2011) Good Practice in Waste Prevention, International Pre-Waste Workshop, March 2011, http://www.bruxellesenvironnement.be/uploadedFiles/Contenu_du_site/Professionnels/Formations_et_s%C3%A9minaires/Conf%C3%A9rence_Pre-waste_2011_%28actes%29/p2-posters-good-practices.pdf

2. Bruxelles Environment (2010) Mapping Report on Waste Prevention Practices in Territories within EU27 - Pre-Waste: Improve the Effectiveness of Waste Prevention Policies in EU Territories, October 2010, http://www.bruxellesenvironnement.be/uploadedFiles/Contenu_du_site/Professionnels/Formations_et_s%C3%A9minaires/Conf%C3%A9rence_Pre-waste_2011_(actes)/p3-%20prewaste-mapping-report.pdf

3. The full impacts of this levy are covered in the case study described in the preceding section

4. Friends of the Irish Environment (2010) Call for Ireland to Extend Levy to all Single-use Bags, Date Published: 30 December 2010, Date Accessed: 19 September 2011, www.friendsoftheirishenvironment.net/index.php?do=friendswork&action=view&id=878

Rate of Tax	Consumption trends	Impacts on litter
5. Dikgang, J. Leiman, A. and Visser, M. (2010) Analysis of the Plastic-Bag Levy in South Africa, Policy Paper No. 18, Environmental Policy Research Unit, School of Economics, University of Cape Town, July 2010, www.econrsa.org/papers/p_papers/pp18.pdf		

A.1.7.2 Suggested Implementation

We have proposed an introduction of a single-use carrier bag tax at a rate of €0.10 per bag, though adjusted for purchasing power parities (see Table 104 for country-specific rates). In countries where such taxes have been implemented, the taxes have been implemented at their full rates with no phased increases. We have assumed such taxes could be implemented by 2015. It is assumed that the taxes, once applied, are kept constant in real terms through either annual, or periodic increases in line with inflation. Experience in Ireland suggests that without such indexation, the use of single use bags can steadily increase as inflation erodes the incentive to use reusable carrier bags.

Table 104: Taxes Applied to Single-use Bags (€ per bag)

MS	AT	BE	CZ	EE	FR	HR	HU	IT	LT	PL	RO	SK
Tax Rate	0.11	0.11	0.07	0.07	0.11	0.07	0.06	0.10	0.06	0.06	0.05	0.07

A.1.8 Taxes on Air Pollution from Stationary Sources

A.1.8.1 Good Practice

There are a number of MS which have used measures to tax air pollutants, usually from industrial plant, and typically, from large combustion plants.

Several MS differentiate their fuel taxes according to the sulphur contents. In this way they exercise an implicit tax on sulphur. The country to do this first was Norway, in 1971 (the tax rate in Norway was NOK 0.078 per litre on sulphur, around €0.009 per litre of sulphur).[514] Presently the following MS differentiate one or more of their fuel tax rates according to sulphur content; Austria, Belgium, Germany, Netherlands, Slovakia.

Denmark introduced an SO_2 tax in 1996, based on:

1) The sulphur (S) content in the following energy products if the sulphur content is above 0.05 %: gas oil and diesel oil, fuel oil, fuel tar, kerosene, coal, petroleum coke, lignite, petrol (leaded and unleaded), auto gas (LPG), gas (LPG), gas from refineries (mineral oils), natural gas.
2) The sulphur (S) content in: wood, straw, waste etc. used for energy purposes in plants with a capacity of 1,000 kW and more.
3) Instead of paying tax on the sulphur content in the above mentioned energy products, businesses can choose to pay excise duty of the sulphur dioxide (SO2) emissions into the air.

Current rates for the tax are DKK11.1 per kilo of SO_2 emitted or DKK 22.2 per kg of sulphur in the fuel.[515] Denmark has the lowest level of SO_2 emissions per capita of all OECD countries. In 2011, the tax generated DKK 48 million.

Norway implements a tax on NOx emissions. The rate in 2013 was NOK 17.01 per kg (approx. €2.04 per kg). [516]

In Estonia, an air pollution charge exists covering a range of air pollutants (see Table 105). The pollution charge rates, applied to all installations requiring a permit, are increased by a factor of:

- 1.2 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of local governments bordering on the Narva River, if the height of release of pollutants is more than 100 metres above ground level;

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[514] Royal Ministry of Finance (2013) Main Features of the Tax Programme for 2013, http://www.statsbudsjettet.no/Upload/Statsbudsjett_2013/dokumenter/pdf/skatt_eng.pdf

[515] Danish Energy Authority. *Green Taxes in Trade and Industry – Danish experiences.* Copenhagen (no year provided). http://www.ens.dk/da-DK/ForbrugOgBesparelser/IndsatslVirksomheder/TilskudtilCO2afgift/Documents/Green_taxes%20danish%20experiences.pdf

[516] Royal Ministry of Finance (2013) Main Features of the Tax Programme for 2013, http://www.statsbudsjettet.no/Upload/Statsbudsjett_2013/dokumenter/pdf/skatt_eng.pdf

- 1.5 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Jõhvi, Kiviõli, Kohtla-Järve, Narva, Sillamäe or Tartu;
- 2 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Tallinn;
- 2.5 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Haapsalu, Kuressaare, Narva-Jõesuu or Pärnu.

Table 105: Tax Rates for Air Pollutants in Estonia

Pollutant	EUR per 1 ton of pollutant
sulphur dioxide (SO_2) or other inorganic sulphur compounds	86.08
carbon monoxide (CO)	6.35
particulates, except heavy metals and compounds of heavy metal	86.47
nitrogen oxides, calculated as nitrogen dioxide, and other inorganic nitrogen compounds	101.1
volatile organic compounds, except mercaptans and methane (CH_4)	101.1
mercaptans	28,830
heavy metals and compounds of heavy metal	1,240

In Lithuania, taxes are set for emissions from stationary sources into the environment. For emissions to the atmosphere, the tax rates for various pollutants are shown in Table 106.

Table 106: Taxes on Pollutants Discharged into the Atmosphere

Pollutants	Tax rates, LTL/t
SO_2	360
NO_x	680
Vanadium pentoxide	13,311
Solid particles (organic and inorganic)	213
Groups of pollutants	
I	1,402

Pollutants	Tax rates, LTL/t
II	661
III	86
IV	15

A feature of the Lithuanian system is that where environmental measures, intended for use of bio-fuel, or aimed at reducing the emission of pollutants into the atmosphere from stationary sources of pollution by at least 5 per cent, are planned, these are exempted from taxes except in those cases when funds from the state budget are used to fund the measure. The tax exemption is valid for a time period not exceeding 3 years from the beginning of the implementation of the measure.

In France, the TGAP covers a range of environmental taxes, including Atmospheric emissions of polluting substances: in most cases, from € 43.24 to € 259.86 per tonne.

In Italy, a tax is levied on the sulphur dioxide and nitrogen oxide discharged by large combustion plants. The tax rates are:

1) € 106 per t/year of sulphur dioxide,

2) € 209 per t/year of nitrogen oxides.

In Czech Republic, the Clean Air Act introduces a new system of charges for air pollution imposed on VOC, NO_x, SO_2 and PM pollutants. The charge is not collected if it is less than approximately EUR 2,000 (CZK 50,000) because any amount below that threshold would not cover the administrative costs.

Table 107: Taxes on Air Pollution in Czech Republic (CZK per tonne)

	2013-16	2017	2018	2019	2020	2021 onward
TSP	4,200	6,300	8,400	10,500	12,600	14,700
SO_2	1,350	2,100	2,800	3,500	4,200	4,900
NO_x	1,100	1,700	2,200	2,800	3,300	3,900
VOC	2,700	4,200	5,600	7,000	8,400	9,800

Latvia also implements taxes for air pollutants. The applicable rates are shown in Table 108 below.

Table 108: Latvia - Tax Rates for Air Pollution and the Volume of Greenhouse Gases Emitted by Stationary Technological Installations which is not Included in the Number of Transferred Allowances

Classification of emission	2013	2014	2015
	from January 1st till December 31 (LVL/tonne)	from January 1st till December 31 (LVL/tonne)	from January 1st (LVL/tonne)
Solid particles (dust not containing heavy metals)	24	36	40
Carbon monoxide (CO)	5.5	5.5	5.5
Ammonia (NH_3) and other non-organic compounds	13	13	13
sulphur dioxide (SO_2), nitrogen oxide (NO_x - nitrogen oxide sum, recalculated to NO_2)	60	60	60
Volatile organic compounds and other hydrocarbons (CnHm)	60	60	60
Heavy metals (Cd, Ni, Sn, Hg, Pb, Zn, Cr, As, Se, Cu) and compounds thereof, recalculated for the relevant metal, and vanadium pentoxide recalculated to vanadium	800	800	800
PM_{10} air emissions for bulk handling at open terminals or other open areas	480	720	800

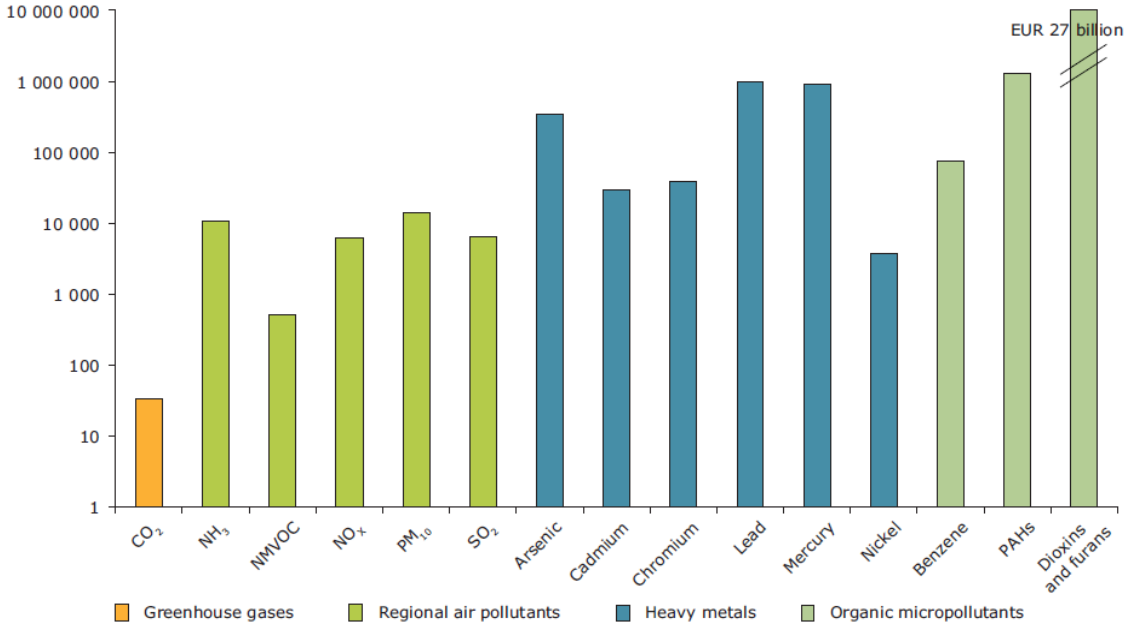
Sweden has a refunded emissions charge for NOx. This has been successful in reducing NOx emissions, but it does not contribute to the budget as the levy revenue is refunded in full to those subject to the tax.

In many of the countries concerned, the levy appears to be well below the level of the externalities, and does not seem to exert a significant environmental effect. The Danish tax appears to be one of the few bona fide taxes that are high enough to have such an effect, with the Norwegian tax on NOx also at relatively high levels. The Swedish system has much higher charge rates for NOx, but this is made possible, in part, by the fact that all revenues are refunded to the affected parties in line with thermal output (so the charge actually works to drive the efficiency of thermal power generation with respect to the emissions of NOx). As such, it does not represent a conventional tax, but a refunded levy.

Of some interest is the fact that some of the newer Member States have tax systems which affect a range of pollutants and installations. This is encouraging and suggests the potential for wider application of such taxes across a range of pollutants. The level at which they are levied, on the other hand, seems rather low. Externalities from the emission of such pollutants are typically at least a factor of 10, and sometimes a factor of 100 or more, higher than the tax rates levied (see Figure 17). Another effect of this is that revenues tend to be very small. The Italian tax raised €13 million in 2011, which is a notional proportion of GDP. It compares with figures for the externalities from industrial

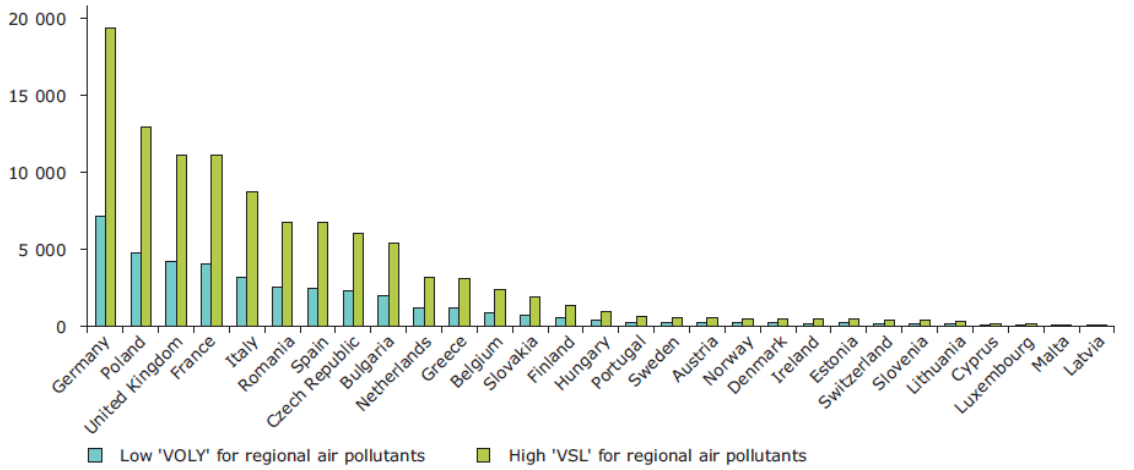
facilities which appear to be well over 100 times that value, irrespective of the assumed approach to mortality valuation (which influences unit damage costs - see Figure 18).

Figure 17: Estimates of the European Average Damage Cost (€ per tonne) Emitted for Selected Air Pollutants (note the logarithmic scale on the Y-axis)



Source: EEA (2011) Revealing the Costs of Air Pollution from Industrial Facilities in Europe, EEA Technical report, No.15/2011, p.23

Figure 18: Aggregated Damage Costs by Country, excluding CO_2 (€ million)



Note: The low-high range shows the differing results derived from the alternative approaches to mortality valuation for the regional pollutants.

SouSource: EEA (2011) Revealing the Costs of Air Pollution from Industrial Facilities in Europe, EEA Technical report, No.15/2011, p.33

A.1.8.2 Suggested Implementation

The suggestion is that there is scope for introducing such taxes where other equivalent schemes (such as emissions trading) are not already in operation, and for increasing them where they already exist. We suggest rates moving towards €1,000 per tonne of SO_2, €1,000 per tonne of NOx, and €2,000 per tonne of PM_{10} (and / or €3,000 per tonne of $PM_{2.5}$). Such rates are still below the level of the externalities generated (see

Figure 17), but are more likely to generate some additional incentive for abatement. In fact where abatement costs are lower than the externalities these would determine the rate.[517]

The suggested transition period from existing rates, or where there is no air pollution tax in place, is from 2015 to 2020. It is assumed that the taxes are indexed to inflation (they stay constant in real terms) for the purposes of the revenue calculation. In practice, this may happen through annual indexing or through periodic adjustments.

517 http://www.unece.org/fileadmin/DAM/env/documents/2009/EB/wg5/wgsr45/Informal%20docs/NMR_Gothenburg_Protocol_finalversion.pdf

A.1.9 Water Abstraction

A.1.9.1 Good Practice

The majority of Member States appear to have some kind of tax or charging scheme for water abstraction and/or supply. Although only two MS have reported their water tax to the Commission's 'Taxes in Europe database', the TAXUD list of 'minor taxes' features further MS with water abstraction taxes or charges in places. MS have also reported such taxes to the OECD/EEA database on economic instruments. Apparently revenues from some of these schemes are ring-fenced for water management purposes and so do not feature in Eurostat's revenue statistics (they may have more the character of charges than taxes, with revenues used to manage, or support the management of, the water resource).

Altogether 20 of 28 MS are reported in one of these sources to have such environment-related tax or charge, which is not a simple user charge or water tariff for the supply of water, MS that have NOT reported any such instrument include Ireland, Cyprus, Malta, Slovakia, Luxembourg, Sweden, Finland and Austria.

Numerous exemptions and special arrangements apply where these instruments are concerned, making it difficult to assess their tax bases accurately. For the same reason revenue flows appear to be rather small in most MS, although water across Europe is a scarce resource in many regions. As water is abstracted at relatively well-defined points, the administrative requirements for a fiscal instrument are not very demanding. Even in regions where water is relatively abundant, the 'tragedy of the commons' has caused shortfalls in water availability in the absence of pricing. Hence, it is appropriate with a fiscal instrument to ensure that water is abstracted for purposes of genuine economic value and is not wasted. Article 9 of the EU's Water Framework Directive aimed for 'adequate' full-cost water pricing by 2010, which is understood to include pricing of the resource. Article 9(1) states that *"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs"*.

In Netherlands a national tax is due on tap water. The tax is due on water supplied in piped water supply. The tax applies to households, as well as to water used for business purposes. The rates are banded, so that a basic consumption of up to 300m^3 is taxed at a rate of €0.33/m^3, and above that level at a rate of €0.40/m^3. Above 50,000 m^3 the rate is €0.36/m^3 and then lowered successively down to €0.05/m^3 for consumption above 250,000 m^3 annually, which is relevant for business purposes. These rates apply from mid-2014, at which time, the previous basic household rate is being doubled. The tax has raised €125-€130 million in recent years, or 0.02% of GDP, which is expected now to double.

In Denmark, a national tax (introduced 1994) is payable on water extraction from all freshwater bodies. The tax is paid on the quantity of water supplied to the consumer, where this is not less than 90 % of the extracted quantity. This arrangement provides an incentive for water suppliers to monitor leakages more carefully, and they have been considerably reduced in Denmark as a result. Whereas spills and leakages at the level of 30-40% are usual in many European cities, Denmark has recorded a leakage rate of 10%. The tax was DKK 5.23 per m^3 in 2012, and 5.46 per m^3 in 2013 – or €0.73/m^3.

In addition to the national tax, a temporary surtax is due for the purpose of protecting groundwater aquifers, this surtax amounts to DKK 0.67 /m^3 or €0.09 /m^3.

Denmark's water tax raised DKK 1,333 million in 2011, equivalent to 0.07% GDP, which is well above most other schemes. According to results from the EU-funded EPI-WATER project household consumption of drinking water has dropped by 40 per cent over the past 20 years in one representative Danish river catchment as a result of the full-cost water pricing scheme including this tax, due in part to many new and simple water saving installations being introduced. In turn, this has improved water flows, especially in smaller brooks and streams, where numerous red list species dependent on water are resident.

The majority of the new MS that joined EU from 2004 and onwards have in place water abstraction charges, implying that the administrative requirements are in place. Schemes are often differentiated and complex to capture adequately, in particular, because reporting to EU appears to be inadequate and, in some cases, absent. Table 109 below shows the case of Latvia.

Table 109: Tax Rates for the Extraction of Water, Lithuania

End Use	Tax Rate (per m^3)	
	LTL	EUR
Groundwater, with exception of mineral water:		
a) Provided by water supplier for household use and heating	0.06	0.02
b) Used by legal entities for commercial purposes, put up in a container	10.8	3.12
c) Other (not specified in a and b) groundwater	0.24	0.069
Mineral water, with exception of mineral water used in medical institutions	10.8	3.12
Mineral water used in medical institutions	5.4	1.6
Surface water used for industry and agriculture	0.007	0.002
Surface water used for cooling of thermal power plants	0.0007	0.0002
Surface water for fishery sector	0.0005	0.0001
Surface water hydropower	0.00003	0.000008
Surface water nuclear power plant	0.001	0.00028
Building Primer	0.64	0.19

Source: Republic of Lithuania (2012) Law on State Natural Resources, Actual version of the Law on 1st January 2012, Annex 2, Accessed 21st January 2014, www3.lrs.lt/pls/inter2/dokpaieska.showdoc_l?p_id=416294

A.1.9.2 Suggested Implementation

The suggested approach takes its starting point from the approaches in Denmark (€0.73 /m^3 for households excl. surtax), the Netherlands (€0.36 /m^3 for business), and the lowest Dutch rate for businesses which is applied to agriculture. The household and business tax rates have been adjusted to reflect purchasing power parities (see Table 110 and Table 111), and then, as a proxy for the seriousness of the problems related to the water resource, and recognising there is no perfect indicator in this regard, the Water Exploitation Index (WEI – see Figure 19).

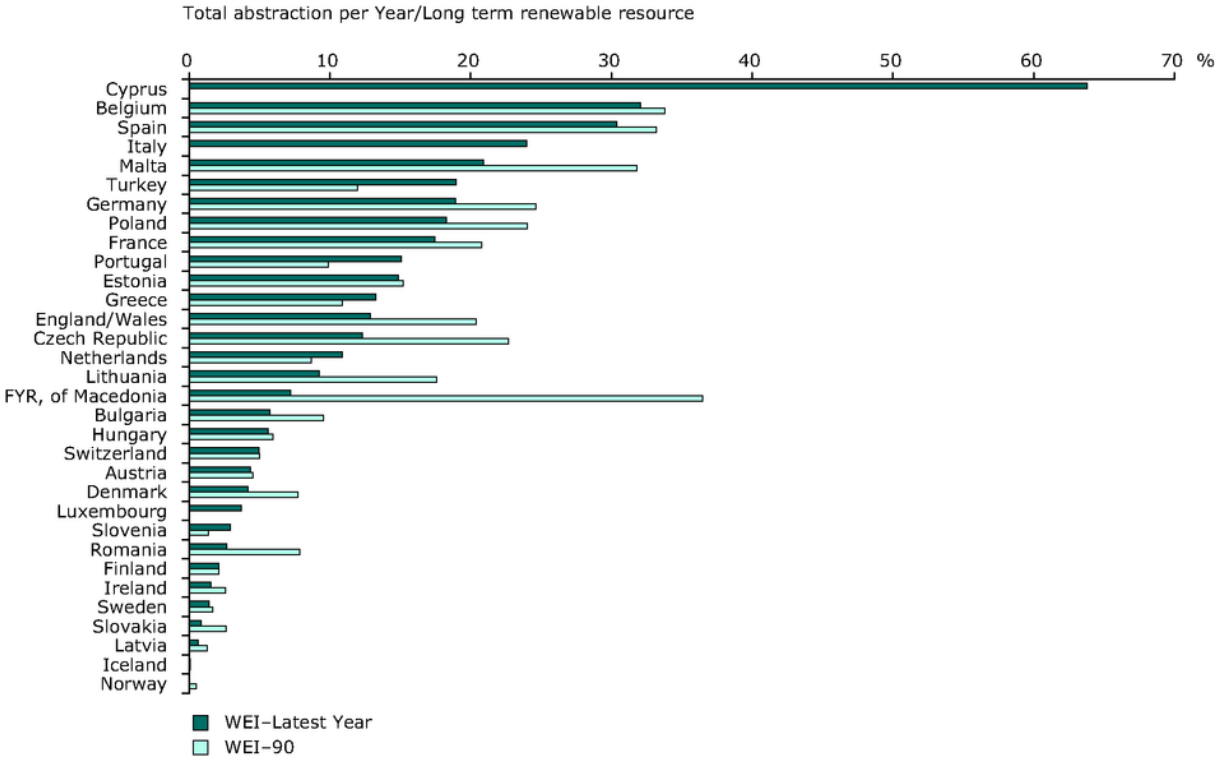
Table 110: PPP Adjustment for Tax Rates for Water Abstraction, Water Use in Households, in Countries under Assessment

MS	AT	BE	CZ	EE	FR	HR	HU	IT	LT	PL	RO	SK
Tax rate	0.59	0.52	0.29	0.38	0.60	0.35	0.31	0.54	0.32	0.30	0.26	0.36

Table 111: PPP Adjustment for Tax Rates for Water Abstraction, Business Use, in Countries under Assessment

MS	AT	BE	CZ	EE	FR	HR	HU	IT	LT	PL	RO	SK
Tax rate	0.36	0.36	0.23	0.23	0.37	0.21	0.19	0.33	0.20	0.19	0.16	0.22

Figure 19: Annual Total Water Abstraction as a Percentage of Available Long-term Freshwater Resources around 1990 (WEI-90) Compared to Latest Year Available (1998–2007) (WEI-Latest Year)



Source: EEA (see http://www.eea.europa.eu/data-and-maps/figures/water-exploitation-index-wei-3)

The PPP adjusted rates in Table 110 and Table 111 were multiplied by:

- 0.25 for MS with a WEI <10%
- 0.50 for MS with a WEI >10%, <20%
- 0.75 for MS with a WEI between >20%, <30%
- 1 for MS with a WEI between >30%

This leads to the rates shown in Table 112 below. These are assumed to be phased in over a period to 2018. After this, they are assumed to be indexed in line with inflation.

Table 112: Suggested Tax Rates for Water Abstraction (€/'000 m³)

	Public supply	Manufacturing	Agriculture
Austria	150	90	12.5
Belgium	600	360	50
Croatia	90	55	7
Czech Republic	190	115	16
Estonia	190	120	16
France	300	180	25
Hungary	80	50	7
Italy	400	250	35
Lithuania	80	50	7
Poland	155	95	13
Romania	65	40	6
Slovakia	90	55	8

A.1.10 Discharges to Waste Water

Numerous Member States have some kind of tax, or other fiscal instrument addressing waste water discharges. Altogether, 14 MS have reported a waste water levy to the Commission's 'Taxes in Europe database', or the OECD/EEA database on economic instruments. MS that have not reported any such fiscal instrument include Austria, Croatia, Finland, Sweden, Ireland, Greece, Portugal, Italy, UK, Cyprus, Latvia, Malta and Bulgaria. Of these, only Austria, Italy and Croatia are included in this study.

Revenues from several of these schemes are ring-fenced for water management purposes but, nevertheless, in most cases feature in Eurostat's revenue statistics, implying they are not simple user charges for sewage. This relates to the definition of environmental tax as an unrequited payment: even if there is some return regarding water management purposes, there is no direct relationship between the polluter being obliged to pay and the improvements that are achieved, over time, as a result of more general water management efforts.

Most of the schemes are fairly old and dating from the 1960's or 1970's, where water pollution was more clearly on the agenda for many countries. Levy rates have been gradually increased in several MS and the tax base has also been broadened to cover several different types of emissions.

A study by the European Environment Agency reviewed the application of waste water levies in a range of MS (incl. France, Germany, Poland, Estonia, Spain, Denmark and Netherlands) and identified, in line with other previous studies, the Dutch scheme as the most comprehensive in terms of 'good practice'[518]..

The Dutch waste water levy was introduced with the Surface Waters' Pollution Act of 1970. In the Netherlands, the levy applies to discharges of organic material, nitrogen, mercury, cadmium, copper, zinc, lead, nickel, chromium and arsenic. The levy is imposed on all direct discharges to surface waters, as well as on all indirect discharges. The levy does not cover the costs of the sewer network, which is financed via a separate municipal fee. Insofar as the levy applies also to direct dischargers, i.e. industries and municipal treatment plants which discharge directly to surface waters, it provides a sound incentive to minimise discharges, and is in line with the polluter-pays principle.

Among the old Member States France has a well-developed system for waste water levies, based on the six regional Water Agencies. There is a comparable approach in the Flemish region of Belgium. Among the new Member States, Poland and Estonia have well institutionalised systems for waste water levies, the revenues from which are ring-fenced for Environmental Funds. The systems in Hungary, Lithuania and Romania are comparable in approach, but with lower rates and weaker frameworks for water management.

MS in this study that have NOT reported this fiscal instrument include Austria, Italy and Croatia. Whether the discharge fees in Czech Republic and Slovakia qualify as user

[518] EEA (2005) Effectiveness of urban wastewater treatment policies in selected countries: an EEA pilot study, EEA Report 2/2005, Copenhagen.

charges or waste water levies would require a more thorough review of the legal framework.

A.1.10.1 Suggested Implementation

The suggested approach takes, as its starting point, the approach applied in the Netherlands. The Netherlands tax rates have been adjusted using purchasing power parities in the various MS result, giving applicable tax rates. Data availability for waste water discharges is not sufficient to allow the calculation of potential revenues generated by waste water taxes. For illustrative purposes, therefore, the tax is assumed to be implemented only for simple organic discharges (BOD/COD), this being responsible for reducing oxygen availability and depth of vision in surface waters. The Figures in Table 8 below reflect the application of PPP-adjustments to the Dutch tax rate for BOD, which is €2.47/kg BOD in 2013. There is a high level of regional variability in the application of waste water levies.

Table 113: Rate of Tax to be Applied for BOD, €/kg

MS	AT	BE	CZ	EE	FR	HR	HU	IT	LT	PL	RO	SK
Tax rate	2.47	2.49	1.58	1.60	2.51	1.47	1.29	2.25	1.35	1.30	1.09	1.52

In principle, it would be interesting to extend this analysis to other pollutants, but the data available do not make this possible. Evidently, the strength of the rationale for taxing discharges on other pollutants is likely to vary somewhat across the Member States.

A.1.11 Pesticides

A.1.11.1 Good Practice

A number of countries have implemented taxes on pesticides.

Denmark has a tax which, until recently was levied in the following manner:

Product	Tax Rate
Insecticides and Chemical products for disinfecting of soil	35 % of the retail value, including excise duty and VAT
Herbicides, Chemical products for reduction of plant growth, Chemical deterrents of insects and mammals and Fungicides	25 % of the retail value, including excise duty and VAT
Chemicals for destruction of alga, slime creating organisms in paper pulp, Deterrents of rats, mice, moles and rabbits, Microbiological pesticides.	3 % of the retail value, including excise duty and VAT.

This tax raised DKK 480 million in 2011, or 0.03% GDP.

The tax has recently been revised, so that it includes a 'flat rate' per kg of active ingredient used, and a variable tax level according to the pesticide's score against three criteria: its environmental effect, its environmental fate and behaviour, and its human health effect.[519] Hence, the tax will be levied as follows:

1) Basic tax based on the amount (kg) of active substance in the product - 50 DKK/kg or litre active substances.
2) 107 DKK/kg or litre active substance multiplied by the score of the environmental effect
3) 107 DKK/kg or litre active substance multiplied by the score of the environmental fate and behaviour effect
4) 107 DKK/kg plant protection product multiplied by the score of the human health effect

This tax is expected to increase revenues (in 2012 prices) by DKK150 million per annum.

Sweden has a much simpler pesticides tax which is simply levied on the amount of active ingredient in the pesticide. The tax rate is SEK 30 per kilogram of active substance of the pesticide.

Norway has pioneered approaches (now adopted in Denmark) based on the risk profiling of pesticides. There are 5 different classes of pesticides for professional use, classified according to their health and environmental impact, and 2 classes of pesticide for private garden use. The tax is calculated using a 'basic tax' of 25 NOK/hectare (about

[519] See note from the Danish Ministry of the Environment (2013) *Background and content of the new pesticide tax*, Pesticider og Genteknologi, Den 29. maj 2013

€3.4 euros), and calculating either a tax per hectare equal to the basic tax, multiplied by a factor which lies between 0.5-9 for products for professional use, and 50-150 for products for private garden use. The equivalent tax per kg or litre = 25 NOK x factor x 1000 /SAD. The tax raised NOK 60-65 million per year (about €8.2-€8.9 million).[520]

In Italy, a flat tax of 0.5% was introduced in January 2000 (Law No 488/99) to all pesticides manufactured and sold with the following risks: R33 ("with risks of cumulative effects"), R40 ("limited evidence of carcinogenic effect", R45 ("may cause cancer") and R60 ("may impair fertility").[521] In the case of pesticide imports, a flat tax of 1% over the final price was introduced. The income raised by this levy is used to develop organic farming and quality products. Under the Ministry of Finance, the Italian Government created a "Fund for the development of organic farming and quality products" in order to finance the following measures under the national and regional programmes:

1) financing research and experimenting on low environmental impact agriculture;
2) supporting promotion and information campaigns on organic agriculture, regional products and PDO (Protected Designation of Origin);
3) producing, revising and publicising the code for good agricultural practice.

However, not all the income raised by the pesticide tax has been used; 5 million EURO was allocated to the national plan for organic farming but this plan is still to be implemented.

Belgium previously had a tax in place, but the tax was abolished in 2007 (and replaced with stricter regulation).[522]

A.1.11.2 Suggested Implementation

It is suggested that there remains considerable potential for application of pesticide taxes. It remains possible, also, that this can improve the efficiency of agriculture by signalling to farmers the need to consider the rate of application of existing products. There are believed to be considerable differences in terms of impacts between the various active ingredients. Hence, basing the tax on the volume of active ingredients does not solve the problem.[523] The recent tendency has been for pesticide taxes to be banded in accordance with some measure of 'potential to do harm'. This is in response to past criticisms of pesticides taxes – that they were not necessarily reflective of actual environmental impact. The Norwegian and revised Danish taxes are deliberately banded in such a way as to improve efficiency of application of pesticides, and move the use of

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[520] See Erlund Spikkerud (2012) Pesticide Taxation in Norway, presentation from the Norwegian Food Safety Authority.

[521] Pesticides Action Network Europe (2005) Pesticide taxes- national examples and key ingredients, *Briefing no. 6*, December 2005 http://www.pan-europe.info/Archive/publications/downloads/PesticideTax.pdf

[522] Vojtech, Vaclav (2010), "Policy Measures Addressing Agri-environmental Issues", *OECD Food, Agriculture and Fisheries Papers*, No. 24, OECD Publishing. http://dx.doi.org/10.1787/5kmjrzg08vvb-en

[523] See for example Szabó Z., 2011: Evaluation of external environmental impacts of crop production: Case study of an intensive farm and an ecological farm. LAP LAMBERT Publishing, pp.243. ISBN 978-3-8473-0980-2

pesticides towards those which appear to have the potential to do least harm when they are used.

It has not been possible to gain data for each country disaggregated by the nature of the active ingredient. In the absence of that, we have applied the tax in a manner which is similar to the Danish scheme.

The Norwegian tax raises around €8.2 - €8.9 million on a tax base which is typically of the order 700 tonnes of active ingredient. The Danish tax raises €64.3 million on a tax base of around 4,000 tonnes of active ingredient. The average rate of tax per kg active ingredient is €15.80 and €12.21, respectively. We have based the application of a tax of the level of €15 per kg active ingredient. Even so, considering the broader experience in other MS, the starting point here is a rate of €10 per kg active ingredient.

To implement this tax rate in MS, the tax rate is adjusted with differences in relative price levels of the various national agricultural sectors. The adjustment index refers to the effective CAP support schemes per hectare of utilised agricultural area in MS, and has been derived from the CAPRI-model.[524] The resulting tax rates at MS level are indicated in Table 9 below.

Table 114: Tax Rates Suggested for MS for Pesticides Based on Relative Levels of CAP Support (€ per kg active ingredient)

Rate	€2.50	€5.00	€7.50	€10.00	€12.50	€17.50
Countries	EE	LT PL SK RO	CZ	HU HR AT	FR IT	BE

In the application of the tax, some form of banding, rather a more crude approach based on a flat rate per active ingredient, would be appropriate. The application of a flat rate does, however, give a sensible indication of the likely order of magnitude of the potential revenue take.

The suggested transition period from existing rates, or where there is no pesticides tax in place, is from 2016 to 2018.

[524] Annex III 'Intensity of spending for CAP pillar 1 and pillar 2 per hectare of UAA' in European Environment Agency (2009) *Distribution and Targeting of the CAP Budget from a Biodiversity Perspective*, EEA Technical Report 12/2009.

A.1.12 Fertilisers

A.1.12.1 Good Practice

Relatively few countries have currently taxes on fertilisers. Usually, the focus has been on nitrate pollution, with phosphate being of some interest also. A report for the OECD noted:[525]

> *Since 1998, the **Netherlands** has tackled the measurement problem by introducing a range of levies on off-farm nutrient emissions above a set limit. Since 2006, the system directly regulates the maximum amount of fertilizers (animal manure plus maximum amounts of nitrate and phosphate) that may be used on the farm. The former system (MINAS) regulated emissions, not usage, to comply with the EU nitrate directive. Similar taxes on the estimated on-farm generation of nutrients over set levels are also in place in **Belgium**. The **Czech Republic** applied, taxes on ammonia emissions per head of ruminants in large scale enterprises. Fertilizer levies are applied in **Italy**, **Sweden** and some states of the **United States**. Input-based taxes are generally inexpensive to administer, but may be less effective than a tax on pollution itself, as they do not discriminate on the basis of actual loading on the environment.*

Mineral fertilizer taxes were in place in Finland, Austria and Sweden for up to two decades before they joined the EU in 1995. Rougoor et. al. report that fertilizer use was relatively inelastic (price elasticities ranging from -0.1 to -0.5) in response to these taxes, but nevertheless, they estimated the presence of significant impacts, in particular in Austria, with a tax rate at 70% of the fertilizer price.[526]

A leaching tax was in operation in the Netherlands from 1998-2005.[527] To calculate the farm-specific losses, a comprehensive mineral accounting scheme (MINAS) was introduced. Farmers were obliged to account for nitrogen applications and offtakes, and were taxed accordingly. Tax rates were increased in steps from low initial levels, and in the final years, amounted to €5/kg N and €20/kg P, which is around 5-10 times the market price for mineral nitrogen fertilizer, for example. Still, it was only surplus losses of nitrogen and phosphorus that were addressed, with tax-exempted allowance thresholds of 40 kg N/ha and 10 kg P/ha. The European Court in its decision on the Dutch implementation of the Nitrate Directive assessed the compatibility of this taxation scheme with the Nitrates Directive and raised a question mark over leaching taxation due to the inherent uncertainties, and the discretion with book-keeping, which led to the MINAS scheme coming to an end.

A nutrient input taxation scheme has been introduced in Denmark for phosphorus. Traded animal fodders are subject to the tax rate of €0.5 per kg of P. A 20 per cent P-reduction was observed within 3 years from the start in 2005. Denmark also has a tax on

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[526] Rougoor CW, van Zeijts H, Hofreither MF and S Bäckman, 2001, Experiences with fertilizer taxes in Europe, Journal of Environmental Planning and Management 44:6, 877-887.

[527] Oenema O and Berentsen P, 2005, Manure policy and MINAS: Regulating nitrogen and phosphorus surpluses in agriculture of the Netherlands, OECD OM/ENV/EPOC/CTPA/CFA(2004)67/FINAL.

nitrogen fertilisers with a rate of €0.67/kg N, but this tax exempts farmers (see EPI-WATER).[528]

A.1.12.2 Current Situation in the 12 Countries

The OECD/EEA database on economic policy instruments reports application of duties on ammonia nitrogen in Czech Republic and Bulgaria, though the Czech Ministry informs us that under the new act of protection of air quality, this is no longer applied. The investigations in this work indicate that Croatia also applies a tax on mineral nitrogen in fertiliser.[529]

A.1.12.3 Suggested Implementation

It follows from the decision by the European Court in the MINAS case, that input taxation is required for a scheme to be compatible with the Nitrates Directive: the justification as followed by the Court stresses that the legal requirements of the Directive relate to the input of nutrients, and not to surpluses over a specified level (as in the Dutch scheme, now abandoned).[530] Hence the tax base for a scheme needs to refer to the input of nutrients, as is the case for the mineral fertiliser tax in Croatia.

As for a nitrogen tax rate, the 'best practice' identified is presumably Austria, with rates up to €0.47/kg N. Even so, considering the broader experience in other MS, the starting point here is a rate of €0.2/kg N.

To implement this tax rate in MS, the tax rate is adjusted with differences in relative price levels of the various national agricultural sectors. The adjustment index refers to the effective CAP support schemes per hectare of utilised agricultural area in MS, and has been derived from the CAPRI-model.[531] The resulting tax rates at MS level are indicated in Table 10 below.

Table 115: Tax Rates Suggested for MS for Nitrogen Fertilisers Based on Relative Levels of CAP Support (€ per hectare UAA)

Rate	0.05€/kgN	0.10€/kgN	0.15€/kgN	0.20€/kgN	0.25€/kgN	0.35€/kgN
Countries	EE	LT PL SK RO	CZ	HU HR AT	FR IT	BE

[528] http://www.feem-project.net/epiwater/pages/download-public-deliv.html; Synthesis report

[529] See also UNECE (forthcoming) *Environmental Performance Review: Croatia*, in preparation.

[530] European Court, 2002, Case C-322/00, Commission v. Netherlands, Opinion of Advocate General Léger.

[531] Annex III 'Intensity of spending for CAP pillar 1 and pillar 2 per hectare of UAA' in European Environment Agency (2009) *Distribution and Targeting of the CAP Budget from a Biodiversity Perspective*, EEA Technical Report 12/2009.

The suggested transition period from existing rates, or where there is no such tax in place, from zero rates, is from 2016 to 2018.

A.1.13 Aggregates and Raw Materials

A.1.13.1 Good Practice

The objectives for introducing a tax on aggregates vary depending upon the country in which it is being implemented. The policy can have four main effects on aggregates:

- Reduce the amount of virgin aggregate material extracted (reduced consumption leads to less disposal);
- Increase the amount of aggregate re-use;
- Increase the use of substitutes for primary aggregate; and
- Increase the recycling of, and use of, secondary aggregates

A tax on aggregates is a fiscal measure which usually works by shifting the price differential against virgin, and in favour of secondary aggregates, making it financially more beneficial to recycle aggregate and use secondary aggregate. The recycled aggregate is mainly derived as waste from the construction and demolition industry.

Denmark, Sweden, the UK, Belgium (Flanders) and Italy (at a regional level) have all implemented a pure aggregate levy.[532] The main policy objectives and the year in which the policy was introduced are outlined in Table 116.

Table 116: Main Aggregate Levy Policy Objectives

	Denmark	Sweden	UK
Name of Policy	Tax on Waste and Certain Raw Materials	The Law Concerning Tax on Natural Materials	Aggregate Levy
Year Policy Introduced	1990	1996	2002
Objective 1	To reduce resource extraction	To safeguard gravel resources and water quality	To reduce demand for aggregates and encourage recycling
Objective 2	To increase aggregate recycling	To increase material substitution to crushed rock and recycled material	To compensate for environmental externalities caused by quarry activities

The Danish raw material extraction tax[533] was introduced in 1987, alongside the waste tax. In 1990, the tax was modified to become an extracted raw materials tax (sand, gravel, stones, peat, clay and limestone), to reduce the use of these natural materials and to promote the use of recycled products, such as construction and demolition waste.

[532] R. Bleischwitz and b. Bahn-Walkowiak (2007) Aggregates and Construction Markets in Europe: Towards a Sectoral Action Plan on Sustainable Resource Management, Minerals and Energy, *Raw Materials Report*, 22:3, 159-176.

[533] Söderholm, P. (2011); ec.europa.eu/environment/integration/research/newsalert/pdf/262na1.pdf

The combined aggregate and waste taxes have produced a greater demand for recycled substitutes: in 1985 only 12% of construction and demolition waste was recycled, compared with 94% in 2004. The following are described by an ECOTEC report as being exempt from the tax:[534]

- Raw materials extracted for coastal projects to protect the beaches against erosive action;
- Sea bed materials, which originate from maintenance and capital dredging projects and which are utilised as raw materials;
- Residual products and waste products, which are extracted from already closed depots;
- Top soil and peat, which are delivered without payment; and
- Raw materials commercially extracted or imported by a business, when the annual amount is less than 200 m^3 of raw materials.

The tax in Denmark is based on volume (m^3) of material extracted and the tax currently stands at DKK 5 per m^3. The revenue generated goes directly to the State's general budget as well as towards subsidy schemes, which support waste-related initiatives in the fields of waste prevention, recovery and recycling.

In Sweden, gravel is a very important resource due to necessity for aquifers on which much of the country relies for drinking water. It was also recognised that gravel is an easily extractable, finite resource. This was leading to a shortage of gravel in some parts of Sweden. The tax was therefore introduced for environmental reasons and aimed to make gravel-alternatives more cost-competitive, therefore increasing use of recycled aggregates, and reducing consumption of gravel. Sweden's 'Tax on Natural Materials', commonly referred to as 'Gravel Tax', applies to gravel, which consists mainly of sand, gravel, cobble and boulder size fractions.

In Sweden the tax is levied on the basis of weight and the current level of tax is SEK 13 per tonne of extracted material.

The UK's 'Aggregate Levy' applies to aggregate which in the UK is deemed to consist of sand, gravel and rock, with the following exceptions:

- Materials such as clay, slate and shale, which are not strictly aggregates but which are used for similar purposes;
- Minerals (mainly for industrial use) whose extraction necessarily involves the extraction of stone, gravel or sand; and
- Coal, metals and peat.

The levy is applied to materials which are:

- Quarried in the UK;
- Mined underground in the UK;
- Dredged from UK waters; or

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[534] ECOTEC Research and Consulting (2001) *Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the EU and its Member States*, Accessed 21st October 2008, http://ec.europa.eu/environment/enveco/taxation/pdf/ch11_aggregated_taxes.pdf

- Imported into the UK.

In the UK the aggregate levy is also levied on a weight basis and currently stands at £2.00 (approx. €2.40) per tonne (increased from £1.60 (€1.92) per tonne in April 2008 to account for inflation).[535]

The level of tax implemented is considerably higher in the UK, as a proportion of price, than elsewhere. In the UK the tax on aggregates equates to 20% of the average price for sand, rock and gravel compared to the case of Sweden, where the tax equates to only 12% of the average price.

The UK recently saw an increase in the rate of the levy, but generally, the level of aggregate tax has been fairly stable over time. Sweden, however, has introduced incremental increases in the tax over time.

The taxes raised 0.02% of GDP in UK, and less than 0.01% of GDP in Sweden. The Danish figures reported are combined with those derived from the tax on incineration and landfilling so the contribution is less easy to discern.

In Latvia, taxes are levied on the extraction or use of natural resources or environmental pollution. The taxes are paid by the person who has received or is under obligation to receive a permit, and who in the territory of the Republic Latvia, continental shelf or exclusive economic area obtains taxable natural resources, or realizes taxable natural resources, obtained in an economic activity which is not related to the output of mineral deposits. The tax rates are set out in Table 117.

Table 117: Tax Rates for Resource Extraction and Use in Latvia

Type of resource	Unit of measurement	Rate, LVL
Soil	m^3	0.3
Sandy loam and clay loam, aleirite	m^3	0.1
Quartz sand	m^3	0.25
Sand	m^3	0.15
Sand-gravel (fragments > 5 mm content > 15%)	m^3	0.25
Clay, other clayey rock for the production of construction materials	m^3	0.15
Dolomite for decoration (finishing)	m^3	0.25
Dolomite	m^3	0.15
Limestone	m^3	0.2

[535] Converted using an exchange rate of €1.2 = £1.

Type of resource	Unit of measurement	Rate, LVL
Freshwater limestone (friable and chunky)	m^3	0.1
Travertine	m^3	1
Gypsum	m^3	0.35
Field stones	m^3	0.4
Pigmentary soil	m^3	0.1
Peat (moisture – 40%)	ton	0.3
Organogenic sapropel (algal and zoogenic – algal) and organocenic lime with ash, < 30% (moisture – 60%)	ton	0.5
Other sapropel (moisture – 60%)	ton	0.1
All types of medicinal mud	ton	0.5
Edible park snails (Helix pomatia L), collected for further economic utilisation	kg	0.03

In Lithuania, the relevant tax rates are set for one cubic meter of extracted natural resources, except in the case of amber and for hunting. The rate on amber is set per 1 kg of extracted resource, and the hunting tax is set for each hectare of hunting area. The natural resource tax is applied tenfold in cases where the amount of extracted resources is concealed. The tax raised 0.06% GDP in 2011 (the amount having tripled since 2006).

In France, under the TGAP, there is a tax on the release for consumption and supply on the domestic market of aggregates: the tax is levied according to weight at € 0.20 per tonne.

In Estonia, economic operators pay a mineral resources extraction charge for the extraction and use of mineral resources belonging to the state. Mineral resources for which such a tax is payable include dolomite, granite, gravel, sand, limestone, clay, peat, phosphate rock, oil shale, and crystalline building stone.

Czech Republic and Italy are not included in this review because these taxes are mining charges, not aggregate product taxes, and do not impact upon aggregate waste and recycling in any significant way.

A.1.13.2 Suggested Implementation

It is suggested that the implementation of such taxes should be such that the rates applied to aggregates in the UK (€2.40 per tonne) are applied to the types of materials covered by such taxes.

There appears to be little reason to phase this tax in. It is suggested that where there is no aggregates tax in place, or where there are taxes already in place, the tax is implemented at, or raised to, this rate by the start of 2016.

Data on the following categories of aggregates was obtained from Eurostat material flow accounts as the tax base for revenue calculations:[536]

- Marble;
- Chalk and dolomite;
- Slate;
- Limestone and gypsum;
- Sand and gravel.

As with the UK tax, it is assumed that the tax is levied on the first use or sale and that those who export are effectively given a tax credit for aggregate that is exported from the country on provision of relevant documentary evidence.

[536] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_mfa&lang=en

A.1.14 Power Sector and the ETS

In Phases I (2005-2007) and II (2008-2012) of the EU Emissions Trading Scheme (EU ETS), the Member States (MSs) could auction up to 5% and 10% of allowances, respectively, as they saw fit. For the first trading period of the EU ETS (2005-2007) only 4 countries (Denmark, Hungary, Ireland and Lithuania) used auctioning or direct selling, as opposed to grandfathering, for allocating EU allowances (EUAs) to the companies covered by the scheme. Although only Denmark chose to auction the full 5% allowed, it finally decided to sell them directly on the market. In Phase II, a larger number of countries auctioned or sold allowances. These are shown in Table 118, along with the total sold or auctioned over the Phase II period. The sale of allowances by year is shown in Table 119.

Table 118: Auctioned or sold Allowances in Phase II of the EU-ETS, '000 emission units (kt CO_2-eq), all stationary sectors (1-9 and 99)

Country	Allowances Auctioned / Sold in Phase II ('000 EUAs)
Austria	2,000
Belgium	9,565
Bulgaria	130
Cyprus	0
Czech Republic	2,569
Denmark	2,837
Estonia	0
Finland	0
France	0
Germany	220,181
Greece	18,750
Hungary	7,675
Iceland	0
Ireland	557
Italy	0
Latvia	0
Liechtenstein	0
Lithuania	3,331
Luxembourg	4

Country	Allowances Auctioned / Sold in Phase II ('000 EUAs)
Malta	0
Netherlands	16,000
Norway	35,019
Poland	210
Portugal	0
Romania	638
Slovakia	0
Slovenia	0
Spain	0
Sweden	0
United Kingdom	122,819

Source: EEA EU Emissions Trading System (ETS) data viewer, http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer

Table 119: Auctioned or Sold Allowances by Year, '000 emission units (kt CO_2-eq), all stationary sectors (1-9 and 99)

Year	Allowances Auctioned / Sold in Phase II ('000 EUAs)
2005	0
2006	6,782
2007	1,730
2008	53,130
2009	79,315
2010	91,862
2011	92,943
2012	125,034

Article 10(1) of Directive 2003/87/EC requires Member States to auction allowances covered by Chapter III of that Directive not allocated free of charge. Thus, Member States

must auction allowances not allocated free of charge. They may not use any other means of allocation, nor could they withhold or cancel allowances not allocated for free instead of auctioning them.

In 2013 over 40% of all allowances were expected to be auctioned, and the ETS legislation sets the goal of phasing out free allocation completely by 2027. Regular auctions take place in accordance with Commission Regulation (EU) No. 1031/2010 (the "Auctioning Regulation").

For the power generation sector, the rule is that operators no longer receive any free allowances but have to buy them. However, eight of the Member States which have joined the EU since 2004 - Bulgaria, Cyprus, as well as 6 of the countries being considered as part of this study, Czech Republic, Estonia, Hungary, Lithuania, Poland and Romania - have made use of a derogation (under Article 10c of the revised EU ETS Directive) which allows them to allocate, free of charge, a decreasing number of allowances to existing power plants for a transitional period. Latvia and Malta were also eligible to use this derogation but chose not to. The derogations require that the number of free allowances allocated declines progressively to reach zero no later than 2020. In exchange, the eight Member States concerned are required to implement national plans to modernise their electricity sectors and diversify their energy mix through investments worth at least as much as the value of the free allowances.

Because of the rules governing the way in which the EU-ETS functions, we have not made major suggestions regarding how the power sector should be taxed other than in respect of air pollution (i.e., excluding greenhouse gases). In principle, it is possible for Member States to consider setting price floors (the UK, for example, has already done so – see below), but we have taken the view that in the absence of a process being led at the European level, the implied message would be that the cap within the EU-ETS was insufficiently tight. Evidently, the EU-ETS is intended to address only those greenhouse gases covered by the scheme. However, it should also be considered that a minimum rate of tax for electricity (on the output side) exists under the existing (and proposed) Energy Taxation Directive. In addition, we have considered the situation in respect of the level of taxes on air pollution. For these reasons, we have not proposed changes other than in relation to air pollution taxation. Perhaps more important is the way in which the relationship between the power sector and the EU-ETS influences whether or not one interprets some exemptions from energy excise duties as 'environmentally harmful subsidies' or not.

Evidently, the auctioning of revenues provides a source of additional revenue to MSs relative to the situation where they are allocated free of charge. By way of comparison, the quantity sold or auctioned in the last year of Phase II was 125 million across the EU (see Table 119 above). In 2013, the quantity sold or auctioned is expected to have been around a billion (eight times the number in 2012). At the same time, the allowance values have not been particularly high. For UK allowances, the figures for auctions in 2013 and for the first auction in 2014 are shown below. For 2013, the average value of allowances was €4.31 per EUA. For the UK auction, revenue raised was €410 million, or around 0.03% of GDP, in 2013.

Nonetheless, this provides an additional – albeit potentially unstable (because of the potential for allowance values to change) - source of revenue to the countries under examination in this study. It might also be noted that six of the eight countries availing themselves of derogations under Article 10c of the ETS Directive are included within this

study. As such, they will be auctioning a progressively increasing number of allowances between now and 2020.

A.1.14.1 Setting Floor Prices for EUAs

The decline in economic activity which followed the 2008 crisis led to a reduction in demand for EUAs relative to their availability. This led to concerns that the value of allowances under the EU-ETS would remain low, and that the incentive for abatement of greenhouse gases was too weak. This was particularly the case in those countries who had set their own targets to reduce emissions below what was suggested by the EU-ETS. In April 2013, for example, the UK implemented a price floor for allowances through the mechanism of its existing Climate Change Levy. Carbon Price Support rates of the Levy are applied to the use of gas, solid fuels and LPG used in power generation.

Whilst potential exists, therefore, to generate additional revenue from such mechanisms, we have not suggested them in this study.

Table 120: Key Results from UK Auctions of EUAs

Date	Allowances	Clearing Price	Notional
16-Jan-13	4,134,000	€ 5.81	€ 24,018,540.00
30-Jan-13	4,134,000	€ 3.72	€ 15,378,480.00
13-Feb-13	4,134,000	€ 4.57	€ 18,892,380.00
27-Feb-13	4,134,000	€ 4.23	€ 17,486,820.00
13-Mar-13	4,134,000	€ 3.60	€ 14,882,400.00
27-Mar-13	4,134,000	€ 4.68	€ 19,347,120.00
10-Apr-13	4,134,000	€ 4.58	€ 18,933,720.00
24-Apr-13	4,134,000	€ 2.93	€ 12,112,620.00
08-May-13	4,134,000	€ 3.51	€ 14,510,340.00
22-May-13	4,134,000	€ 3.43	€ 14,179,620.00
05-Jun-13	4,134,000	€ 3.96	€ 16,370,640.00
19-Jun-13	4,134,000	€ 4.52	€ 18,685,680.00
03-Jul-13	4,134,000	€ 3.85	€ 15,915,900.00
17-Jul-13	4,134,000	€ 4.06	€ 16,784,040.00
31-Jul-13	4,134,000	€ 4.10	€ 16,949,400.00
14-Aug-13	2,075,000	€ 4.26	€ 8,839,500.00
28-Aug-13	2,075,000	€ 4.56	€ 9,462,000.00
11-Sep-13	4,134,000	€ 4.94	€ 20,421,960.00
25-Sep-13	4,134,000	€ 5.30	€ 21,910,200.00
09-Oct-13	4,134,000	€ 4.70	€ 19,429,800.00
23-Oct-13	4,134,000	€ 4.59	€ 18,975,060.00
06-Nov-13	4,134,000	€ 4.76	€ 19,677,840.00
20-Nov-13	4,134,000	€ 4.40	€ 18,189,600.00
04-Dec-13	4,134,000	€ 4.42	€ 18,272,280.00
15-Jan-14	4,630,000	€ 4.91	€ 22,733,300.00
TOTAL 2013	95,098,000	€4.31	€409,625,940.00

Source: https://www.theice.com/marketdata/reports/ReportCenter.shtml#report/148

A.1.14.2 Aviation in the EU-ETS

EU Aviation Allowances (EUAAs), which were introduced in January 2012, had been expected to be auctioned in a similar way as for power in Phase III. However following the announcement by the European Commission of 12 November 2012, proposing a deferral of the enforcement of the requirements under the EU Emissions Trading System for aircraft operators to monitor and report emissions as well as surrender allowances in April 2013 for emissions from flights into and out of Europe during 2012, auctioning of EUAAs has been suspended (the ETS Directive provides for 15% of aviation allowances to be auctioned).

Given this situation, and given also that the expected proposal from ICAO may not be implemented until 2020, we have suggested that taxes on aviation could be introduced. It is recognised that Member States may want to consider the 'fit' of such an instrument with any proposal once its nature becomes clearer. It is possible that such a proposal could include auctioning of allowances (as had been expected under the EU-ETS), in which case, it might be appropriate to scale back such taxes.

A.2.0 Revenue Calculations

A.2.1 Estimating Revenue Breakdown by Fuel Type

A.2.1.1 Introduction

In this section we outline the methodological approach used to estimate revenue breakdowns by fuel type and usage for each of the 12 Member States analysed.

The primary sources for revenue data were the DG-TAXUD *Taxes in Europe Database*, the National Tax List published by DG-ESTAT, and information obtained from government statistical sources.[537,538] This information was supplemented with revenue data from the OECD *Database on Instruments used for Environmental Policy and Natural Resources Management*. In addition, some revenue data was obtained directly from Member States' environmental and finance ministries.[539]

In most cases, excise duty revenues are not broken down by fuel type, rather, a summary figure is available for all excise duty revenues, or for the revenues relating to each of the major energy carriers / types (mineral oils, natural gas, solid fuels and electricity) without their being broken down by end use. In order to estimate baseline revenues for each individual excise duty going forward, and to compare these to the potential revenues realised through 'good practice', a methodology was designed to estimate revenue breakdowns by fuel type and usage.

In essence, we made a 'bottom up' estimation of the revenues based on current tax rates and energy consumption. Tax rates were gathered from the latest *Excise Duty Tables*.[540] Energy balance data was obtained for each Member State from the 2011 Energy Balance Sheets, published by Eurostat.[541] The proportions of calculated revenue by fuel type over the total calculated revenue figure, were used to pro-rate the actual total revenue figure to each fuel type.

A.2.1.2 Estimating Energy Consumption for ETD Categories

The Energy Balance Sheets publish energy consumption data for each fuel type, which is further grouped according to the final use of the fuel, using the following categories: industry, transport, and other sectors (including a subsector for households). Conversely, excise duty rates are specified within the Energy Tax Directive (ETD) according to the

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[537] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=553/1357119977&taxType=Other+indirect+tax

[538] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/images/b/ba/National_tax_lists_20130717.xls

[539] OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management http://www2.oecd.org/ecoinst/queries/index.htm

[540] 2012 - European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, p.6, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[541] Eurostat (2013) *Energy Balance Sheets 2010-11*, 2013, April 2013, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EN-13-001/EN/KS-EN-13-001-EN.PDF

following fuel usages: motor fuels, industry and commercial motors, and business and non-business heating.[542]

Relating Eurostat data for transport and household fuel consumption to specific excise duties (motor fuels and non-business heating) is relatively straightforward – these categories already exist within the Energy Balance Sheets. For the other excise duty categories – industry and commercial motors and business heating – it was necessary to make a number of assumptions in order to make use of the Eurostat data. In Table 121 we specify which Eurostat categories, for each fuel type, were assigned to each ETD category.

Table 121: Relating Energy Balance Sheet Categories to ETD Categories

ETD Category	Eurostat Category	Eurostat Fuel
Motor Fuels		
Motor spirit (petrol)	Transport	Motor spirit
Light fuel oil (diesel)	Transport	Gas/diesel oil
LPG	Transport	LPG
Kerosene	Transport	Kerosenes, jet fuels
Natural gas	Transport	Natural gas
Industry and Commercial Motors		
Light fuel oil (diesel)	Industry	Gas/diesel oil
Kerosene	Industry	Kerosenes, jet fuels
LPG	-	LPG
Natural gas	-	Natural gas
Business Heating		
Light fuel oil (diesel)	Other sectors (excluding households)	Gas/diesel oil
Heavy fuel oil	Industry and other sectors (excluding households)	Residual fuel oil
Kerosene	Other sectors (excluding households)	Kerosenes, jet fuels
LPG	Industry and other sectors (excluding households)	LPG
Natural gas	Industry and other sectors (excluding households)	Natural gas
Coal	All energy consumption excluding households	Hard coal + Coke + Lignite
Non-Business Heating		
Light fuel oil (diesel)	Households	Gas/diesel oil
Heavy fuel oil	Households	Residual fuel oil
Kerosene	Households	Kerosenes, jet fuels
LPG	Households	LPG

[542] Offical Journal of the European Union (2003) *Council Directive 2003/96/EC*, 27th October 2003, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF

ETD Category	Eurostat Category	Eurostat Fuel
Natural gas	Households	Natural gas
Coal	Households	Hard coal + Coke + Lignite
Electricity		
Electricity - business use	All energy consumption excluding households	Electrical Energy
Electricity - non-business use	Households	

In summary, our assumptions were as follows:

- All industrial consumption of light fuel oil (diesel) and kerosene is used to supply industrial and commercial motors, and was not used for heating purposes;
- All industrial consumption of heavy fuel oil, LPG and natural gas, was for heating purposes. The assumption was made because the IEA tables did not differentiate between the use of some fuels by when used for motor fuels or heating in the industrial and commercial sectors. In the absence of any robust data to estimate a split in the revenues, this simplifying assumption was made, in order to gain as much granularity in the revenue estimations as possible;
- All fuel consumption by 'other sectors' (excluding households) was for business heating purposes.

A.2.1.3 Revenue Breakdown Estimates

Given the above assumptions, we were able to calculate the tax base (total fuel consumption) relating to each of the fuels in the ETD, subcategorised by usage. By taking the product of the tax base and tax rate we calculated the revenues which each Member State should, in theory, have received from energy taxes in 2011. This information was used to estimate the percentages of total revenue relating to fuel usage, presented in Table 122 for each Member State.

Table 122: Approximate % Revenue Breakdowns by Member State

ETD Category	% of Total Revenues from Excise Duties on Energy											
	Austria	Belgium	Croatia	Czech Republic	Estonia	France	Hungary	Italy	Lithuania	Poland	Romania	Slovakia
Motor Fuels												
Motor spirit (petrol)	19.55%	15.80%	35.89%	32.88%	33.35%	15.17%	27.93%	23.58%	22.96%	25.17%	26.98%	31.49%
Light fuel oil (diesel)	44.86%	60.23%	45.94%	50.89%	49.57%	43.47%	47.66%	43.53%	61.69%	52.31%	57.16%	50.12%
LPG (propellant)	0.15%	0.00%	0.05%	0.33%	0.00%	0.04%	0.39%	0.88%	7.85%	4.03%	0.42%	0.43%
Kerosene	5.98%	17.53%	4.47%	5.23%	3.14%	8.93%	5.13%	4.18%	3.62%	3.06%	4.09%	2.05%
Natural gas (prop)	0.23%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.01%	1.04%	0.00%	0.05%	0.00%
Industry and Commercial Motors												
Gas oil	3.07%	0.06%	5.56%	1.48%	1.39%	0.20%	0.00%	0.41%	1.37%	2.20%	4.91%	0.69%
Kerosene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.01%	0.02%	0.15%
Business Heating												
Gas oil	0.98%	0.39%	1.69%	5.10%	3.55%	1.12%	4.93%	2.93%	0.18%	1.95%	0.00%	2.49%
Heavy fuel oil	0.37%	0.06%	0.14%	0.05%	0.05%	0.05%	0.12%	0.19%	0.03%	0.04%	0.04%	0.39%
Kerosene	0.00%	0.01%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LPG	0.05%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.74%	0.00%
Natural gas	4.01%	1.82%	1.50%	1.03%	1.12%	0.62%	1.69%	0.69%	0.00%	0.00%	2.22%	2.50%
Coal	0.34%	0.31%	0.18%	0.53%	0.56%	0.15%	4.70%	0.06%	0.16%	1.16%	0.32%	1.48%
Non-Business Heating												
Gas oil	2.88%	0.80%	0.78%	0.00%	0.15%	0.88%	0.00%	2.22%	0.03%	0.09%	0.00%	0.00%
Heavy fuel oil	0.04%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.01%	0.00%	0.00%
Kerosene	0.00%	0.01%	0.03%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
LPG	0.03%	0.03%	0.09%	0.00%	0.00%	0.00%	0.00%	0.56%	0.00%	0.00%	0.00%	0.00%

ETD Category	% of Total Revenues from Excise Duties on Energy											
	Austria	Belgium	Croatia	Czech Republic	Estonia	France	Hungary	Italy	Lithuania	Poland	Romania	Slovakia
Natural gas	1.58%	0.55%	2.56%	0.59%	0.38%	0.00%	1.76%	6.76%	0.00%	0.00%	1.60%	1.66%
Coal	0.04%	0.03%	0.01%	0.00%	0.02%	0.00%	4.24%	0.00%	0.11%	0.89%	0.00%	0.00%
Electricity												
Electricity - business use	11.25%	1.78%	0.43%	1.36%	4.75%	19.27%	0.99%	9.80%	0.51%	7.38%	0.52%	2.20%
Electricity - non-business use	4.59%	0.58%	0.61%	0.45%	1.96%	10.11%	0.48%	4.14%	0.44%	1.71%	0.93%	0.00%

A.2.1.4 Pro-rating Actual Revenues based on Approximate Revenue Percentages

These estimated revenue breakdowns were then applied to aggregated revenue data (i.e., published revenues for all excise duties on energy). This enabled approximate revenues, disaggregated by fuel type and usage, to be obtained for each Member State, to be used in forward projections of the baseline and 'good practice' scenarios.

A.2.2 Revenue Projections for Energy Taxation

A.2.2.1 Baseline Projections

The following approach was taken to estimate future revenue projections for energy taxes:

- Existing Tax Base for Energy Related Excise Duties
  - The tax base for each fuel type, and electricity, was estimated by dividing the total estimated revenues figures (see Section above) by the excise duty rates.
- Tax Base Projections for Energy Related Excise Duties
  - A simple approach was taken in projecting the tax base for fuels and electricity generation. This was to keep the tax bases constant going forwards.
- Approach to Setting Future Energy Related Excise Duty Rates
  - The approach for energy excise duty rates was to keep the levels constant in real terms. It is clear that energy excise duties are not always increased in line with inflation. On the other hand, it might be considered good practice to index rates in order to maintain their incentive effect. Article 4(4) of the proposed ETD also indicates the desirability of indexing, if only periodically:

    > The minimum levels of general energy consumption taxation laid down in this Directive shall be adapted every three years starting from 1 July 2016 in order to take account of the changes in the harmonised index of consumer prices excluding energy and unprocessed food as published by Eurostat. The Commission shall publish the resulting minimum levels of taxation in the *Official Journal of the European Union*.
- Future Revenue Projections
  - Future revenue figures were calculated by multiplying the future rate by the projected tax base for each fuel type and electricity.

A.2.2.2 Price Elasticities for Good Practice Projections of Tax Bases

The approach for projecting the tax base forwards was to use own-price elasticities to calculate the estimate change in demand, and use, of the different fuels based upon the change in their price associated with the suggested changes in duty levels.

Elasticities indicate the responsiveness of consumer behaviour with respect to changes in explanatory variables, in this case, the price of the fuel. Using the example of energy use, determining the price elasticity of demand permits us to estimate the effects that changes in duties, and it turn, overall energy prices, will have on consumer demand. This is also referred to as the 'own-price' elasticity of demand.

It is important to understand that changes in the demand for a good, such as fuel, are affected not only by the price of the good itself, but also by the price of other goods. So, for example, if the price of diesel increases whilst the price of other fuels do not, the demand for these other fuels may increase, especially if the fuels are close substitutes. The strength of this response is represented by another elasticity, the cross-price elasticity (the elasticity of demand for the fuel with respect to the price of diesel). Demand for goods relative to the price of the good itself and the price of other goods is characterised not by one 'own-price' elasticity, but a matrix of own- and cross-price elasticities.

The figures within this matrix are likely to vary according to the country under study, but they are not so well known in any given country. The figures also differ in the short- and long-term – some factors affecting demand, such as the stock of vehicles, change only over extended periods of time.

In the absence of a complete matrix of own and cross-price elasticities, we opted for a simple approach, using a single own-price elasticity figure for fuel use. This is clearly a simplified way of estimating a reduction in the tax base, and hence, revenue projections, based upon the increased price of the fuels. Modelling no decrease at all would simply not have been a realistic assumption to make, especially as the proportionate change in the price of some fuels is not insignificant.

A number of studies have looked at price elasticities of demand for energy at specific level. For example, a meta-study of residential energy usage from 2004 demonstrated that in the short-run a 1% rise in domestic electricity prices reduces demand by 0.35%, whereas in the long-run demand falls by 0.85%.[543] The fact that demand is more inelastic in the short-run is not surprising. Short-run changes in demand tend to be limited due to the long lifetimes and slow turnover of energy-using appliances and capital equipment. If, however, an increase in energy prices is persistent, this will be more likely to significantly affect adoption of energy efficiency measures leading to a greater reduction in consumption, as consumers replace older capital equipment (and firms develop new processes and products).[544] .

A range of estimates of energy own-price elasticities (both short- and long-run) covering the residential, commercial and industrial sectors, for electricity, natural gas and fuel oil (albeit with a focus on the US) are presented in a 2009 publication from Resources for the Future (RFF).[545] These are summarised in Table 123.

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[543] James, A. Espey, and Molly Espey (2004) *Turning on the Lights: A Meta-Analysis of Residential Electricity Demand Elasticities*, April 2004, p.66.

[544] Gillingham, K., Newell, R.G., and Palmer, K. (2009) *Energy Efficiency Economics and Policy*, April 2009

[545] Gillingham, K., Newell, R.G., and Palmer, K. (2009) *Energy Efficiency Economics and Policy*, April 2009

Table 123: Ranges of US Estimates of Energy Own-Price Elasticities (all values are negative)

	Short-run	Long-run
Residential		
Electricity	0.14 – 0.44	0.32 – 1.89
Natural Gas	0.03 – 0.76	0.26 – 1.47
Fuel Oil	0.15 – 0.34	0.53 – 0.75
Commercial		
Electricity	0 – 0.46	0.24 – 1.36
Natural Gas	0.14 – 0.29	0.40 – 1.38
Fuel Oil	0.13 – 0.49	0.39 – 3.5
Industrial		
Electricity	0.11 – 0.28	0.22 – 3.26
Natural Gas	0.51 – 0.62	0.89 – 2.92
Fuel Oil	0.11	0.5 – 1.57

A number of studies with a European focus provide elasticity estimates that fall within (or close to) to ranges identified in Table 123. A 2004 study using time series data from 1986 to 1999 estimated the long-run price elasticity of residential electricity demand in Greece to be -0.41. [546] A similar study in Cyprus, also using a time series approach, (from 1960 to 2004) estimated the long-run price elasticity of residential electricity demand to be -0.43. [547]

For residential gas, a Norwegian study from 2005 analysed the price elasticity of demand in 12 European countries during the period from 1978 to 2002. Short-run own-price elasticities were typically in the range 0 to -0.3. Long run own-price elasticities were

[546] Hondroyiannis, G. (2004) *Estimating Residential Demand for Electricity in Greece*, 2004 in Table 2 E.ON Energy Research Center (2011) *Econometric Estimation of Energy Demand Elasticities*, October 2011

[547] Zachariadis, T., Pashourtidou, N. (2007) An empirical analysis of electricity consumption in Cyprus, p.191.

typically between 0 and -1.5.[548] These are broadly consistent with those shown in Table 123.

Another Norwegian study estimated price elasticities of demand for several energy goods in OECD countries over 1978 to 1999.[549] The authors estimated elasticities for electricity, and natural gas, in the residential and industrial sectors, as shown in Table 124.

Table 124: Own-price elasticity estimates for OECD Countries (all values are negative). (Figures from Table 123 shown in parentheses)

	Short-run	Long-run
Residential		
Electricity	0.029 – 0.043 (0.14 – 0.44)	0.132 – 3.692 (0.32 – 1.89)
Natural Gas	0.114 – 0.196 (0.03 – 0.76)	0.369 – 0.774 (0.26 – 1.47)
Industrial		
Electricity	0.007 - 0.012 (0.11 – 0.28)	0.037 – 0.045 (0.22 – 3.26)
Natural Gas	0.074– 0.121 (0.51 – 0.62)	0.266– 0.507 (0.89 – 2.92)

The authors note that there exists 'discernible divergence among the estimates of energy demand elasticities from empirical studies due to the differences in modelling methodologies and/or data sets applied in these studies'. This is clearly demonstrated, through comparison with the figures reported in Table 123, which are shown in parentheses in Table 124.

In order to illustrate the elasticity of demand with respect to fuel price, the European Environment Agency draws upon a 2004 literature review undertaken for the UK Government.[550] With a focus on cars, the authors reviewed 69 new empirical studies, published since 1990, identifying the effects of price and income on fuel consumption, traffic levels, and where available, other indicators including fuel efficiency and car ownership.

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[548] Odd Bjarte Nilsen, Frank Asche, and Ragnar Tveteras (2005) *Natural Gas Demand in the European Household Sector*, August 2005

[549] Gang Liu (2004) *Estimating Energy Demand Elasticities for OECD Countries: A Dynamic Panel Data Approach*, March 2004

[550] See Table 3 in Goodwin, P., Gargay, J. And Hanly, M. (2004) *Elasticities of Road Traffic and Fuel Consumption with Respect to Price and Income: A Review,* May 2004, illustration sourced from European Environment Agency (2012) Elasticity of Transport Demand with Respect Fuel Price, Accessed December 2013, http://www.eea.europa.eu/data-and-maps/figures/elasticity-of-transport-demand-with-respect-to-fuel-price

Based on the best defined results, the authors state that if the real price of fuel rises by 10% and stays at that level, the result is a dynamic process of adjustment such that the following occur:

1. Volume of traffic will fall by approximately 1% within about a year, building up to a reduction of about 3% in the longer run (about 5 years or so); and
2. Volume of fuel consumed will fall by about 2.5% within a year, building up to a reduction of over 6% in the longer run.

The authors state that the reason why fuel consumed falls by more than the volume of traffic is probably because price increases trigger a more efficient use of fuel, by a combination of:

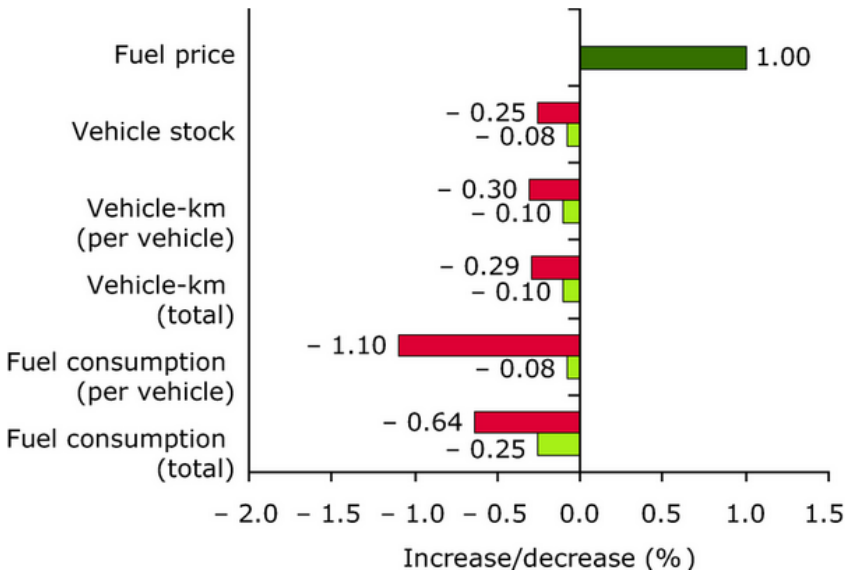
- Technical improvements to vehicles;
- More fuel-conserving driving styles: and
- Driving in easier traffic conditions.

A further probable differential effect is between high- and low-consumption vehicles, since with high prices, 'gas guzzlers' are more likely to be left at home or scrapped. Therefore, further consequences of the 10% price increase (albeit the authors suggest the evidence is not as strong as for the effects noted above) are as follows:

- Efficiency of the use of fuel rises by about 1.5% within a year, and around 4% in the longer run: and
- Total number of vehicles owned falls by less than 1% in the short run and by 2.5% in the longer run.

The headline results of the study, a short run elasticity of -0.25 and a long run elasticity of -0.6, are illustrated in Figure 20.

Figure 20: Elasticity of Transport Demand with Respect to Fuel Price



The authors of a parallel review, also undertaken in 2004 for the UK Government, draw similar conclusions, based on 1083 fuel demand elasticity estimates, from 113 studies published between 1966 and 2000. The authors state that the weight of evidence in the literature suggests that:[551]

- Long-run price elasticity of demand for fuel falls between -0.6 and -0.8; and
- Short-run price elasticity of demand for fuel lies between -0.2 and -0.3.

In 2012, the UK Government's Department of Energy and Climate Change commissioned research to review academic literature of price elasticities for the industrial sector.[552] This showed that there is a wide range of possible elasticities, with the UK Government applying what they believed to be a conservative estimate of -0.2 in their analysis of meeting Article 7 of the Energy Efficiency Directive.[553] However, there is no differentiation in the publicly available document between elasticities for natural gas and electricity.

A 2010 study for Transport and Environment reviewed the literature on road freight elasticities. [554] The authors identified a best estimate of fuel price elasticity with regard to total fuel demand of -0.3, stating that this includes three behavioural responses:

1. Changes in fuel efficiency;
    a. Using more fuel efficient vehicles
    b. Improving fuel efficient driving
2. Changes in transport efficiency; and
    a. Improving the load factor
    b. Changing the route and time of day
    c. Increasing the shipment size
3. Changes in road freight transport demand.
    a. Changing mode: to rail, inland waterways, sea or air

Given the paucity of data relating to specific Member States, and moreover, given the likely range of differing approaches applied in terms of both datasets and methodologies, the choice of elasticities for use in the model has been made on pragmatic grounds.

Reflecting that some long-run effects would take place we take the upper end of the short-run elasticity to reflect the potential for some these long-run effects over the period during for which revenue forecasts are made. Table 125 shows the elasticities we have chosen to apply to the fuels and uses set out in the ETD. Clearly, the choice is subjective, but it should be considered that the main rationale for the application of these

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[551] Graham and Glaister (2004) *Road Traffic Demand Elasticity Estimates: A Review Transport Reviews*, 2004

[552] Paul Ekins (2012) *Energy Price Elasticities: A Critical Survey,* for DECC - unpublished

[553] Communication of the United Kingdom's Proposed Approach and Analysis to Meet Article 7 of the Energy Efficiency Directive, available at http://ec.europa.eu/energy/efficiency/eed/doc/article7/2013_uk_eed_article7_en.pdf

[554] De Jong, G., Schroten, A., Van Essen, H., Otten, M., and Bucci, P. (2010) *Price Sensitivity of European Road Freight Transport – Towards a Better Understanding of Existing Results*, June 2010, p.iv.

elasticities is to overlay some degree of realism on how the tax base is affected by changes in price (consumers are not completely indifferent to price increases).

Table 125: Application of High-level Elasticities to ETD Categories

Fuel Type	Elasticity	Notes
MOTOR FUELS-ENERGY		
Motor spirit (petrol)	-0.30	Upper end of transport fuels elasticity
Light fuel oil (diesel)	-0.30	Upper end of transport fuels elasticity
LPG (propellant)	-0.30	Upper end of transport fuels elasticity
Kerosene	-0.30	Upper end of transport fuels elasticity
Natural gas (prop)	-0.30	Upper end of transport fuels elasticity
INDUSTRY AND COMMERCIAL MOTORS		
Gas oil	-0.30	Average upper end of commercial and industrial fuel oil range
Kerosene	-0.30	Average upper end of commercial and industrial fuel oil range
LPG	-0.30	Average upper end of commercial and industrial fuel oil range
Natural gas	-0.46	Average upper end of commercial and industrial natural gas range
BUSINESS HEATING		
Gas oil	-0.30	Average upper end of commercial and industrial fuel oil range
Heavy fuel oil	-0.30	Average upper end of commercial and industrial fuel oil range
Kerosene	-0.30	Average upper end of commercial and industrial fuel oil range
LPG	-0.30	Average upper end of commercial and industrial fuel oil range
Natural gas	-0.46	Average upper end of commercial and industrial natural gas range
Coal	-0.46	Average upper end of commercial and industrial natural gas range
NON-BUSINESS HEATING		

Fuel Type	Elasticity	Notes
Gas oil	-0.34	Upper end of residential fuel oil range
Heavy fuel oil	-0.34	Upper end of residential fuel oil range
Kerosene	-0.34	Upper end of residential fuel oil range
LPG	-0.34	Upper end of residential fuel oil range
Natural gas	-0.76	Upper end of residential natural gas range
Coal	-0.76	Upper end of residential natural gas range
ELECTRICITY		
Electricity - business use	-0.37	Average upper end of commercial and industrial electricity range
Electricity - non-business use	-0.44	Upper end of residential electricity range

The formula used for calculating the change in demand for the different fuels and electricity was as follows:

$$Q_1 = Q_0 \times ((\text{Fuel Price} + P_1) / (\text{Fuel Price} + P_0))^{\varepsilon}$$

Where:

Q_1 = Final quantity of fuel / electricity

Q_0 = Initial quantity of fuel / electricity

Fuel Price = Unit price of fuel /electricity in real terms

P_1 = Suggested tax rate in real terms

P_0 = Existing tax rate in real terms

ε = elasticity of demand (see Table 125)

The unit prices of the fuels were taken from the following sources:

- Energy.eu provides data on oil products: unleaded petrol, diesel, LPG and heating oil prices (2014) http://www.energy.eu/fuelprices/
- The commission website also holds oil products price statistics (2014): http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm
- Eurostat provides Electricity and Natural gas prices (2012) for industry and domestic consumers
    - http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_price_statistics
    - http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database
- Coal prices were taken from IEA coal industry prices:

- http://www.iea.org/media/training/presentations/statisticsmarch/CoalInformation.pdf

The following assumptions were made to fill data gaps in the energy prices:

- The price of kerosene was assumed equivalent to gas oil;
- Price of natural gas used as a propellant was assumed the same price as natural gas for business heating;
- Gas oil for C&I motors and business heating was based upon non-business heating use, but factored down based upon the relative difference in natural gas prices between non-business and business heating;
- LPG used in C&I motors used the propellant price but factored down based upon the difference in gas oil prices between the two uses;
- Natural gas used in C&I motors was assumed to be the same price as natural gas used for business heating;
- Price for non-business heating coal was assumed to be the same price as business heating coal;
- Industrial electricity price based upon the following band as an average, Band ID: 2,000 MWh < 20,000 MWh;
- Domestic electricity price based upon the following band as an average, Band DC: 2,500 kWh < 5,000 KWh;
- Where there were gaps in the data for certain Member States an average figure from the Member States with data was used.

A.2.2.3 Good Practice Revenue Projections

These largely follow the approach set out above for baseline revenue projections:

- Approach to Setting Future Energy Related Excise Duty Rates
  - The approach for energy excise duty rates was to keep the levels constant in real terms (see above).
- Future Revenue Projections
  - Future revenue figures were calculated by multiplying the future rate, in real terms, by the adjusted tax base (adjusted based on the application of the elasticities as discussed above) for each fuel type and electricity.

A.2.3 Revenue Projections for Transport (excluding fuels) Taxation

A.2.3.1 Vehicle Taxes

As highlighted in the Good Practice Appendix, the approach to suggesting changes in transport taxation is a pragmatic one based on the level of revenue currently generated from taxes on motor fuels and vehicles. The complexity and diversity of the existing tax structures makes it a major exercise to model the way in which the tax base and the tax rates lead to specific revenue outcomes.

The approach adopted, therefore, is relatively simple. For the baseline, the latest revenue figure for total vehicle taxes was projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in vehicle taxation is equal to the annual percentage change in real GDP growth. It should be considered that this might overstate revenues given that in the absence of specific interventions, transport tax revenues have not always maintained a constant share of GDP over time. This means that the additional revenue take associated with suggested increases in revenue might be greater than suggested here.

That having been said, the suggested increase in revenue that might be derived from vehicle taxes in the good practice scenario is also maintained as a constant proportion of GDP. For the good practice projections, the suggested increase in revenues (expressed as a proportion of GDP) is maintained at a constant level in real terms in future years.

A.2.3.2 Aviation Taxes

Baseline Revenue Projections

The latest revenue figure for total aviation taxes was projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in aviation taxation is equal to the annual percentage change in real GDP growth.

Good Practice Revenue Projections

For the good practice projections of revenues from passenger taxes an elasticity based approach has been taken. A long run price elasticity of demand of -0.6 across all passenger types is identified in the UK Government's 2013 Aviation Forecasts.[555] Given the mix of domestic, European and global destinations served from the UK, we take this as representative of the wider price elasticity of demand for air transport in other Member States.

The formula used for calculating the change in passenger flights was as follows:

$$Q_1 = Q_0 \times ((\text{Price of Flight} + P_1) / (\text{Price of Flight} + P_0))^{\varepsilon}$$

Where:

Q_1 = Final number of flights

Q_0 = Initial number of flights

Price of Flight = Unit price of passenger flight in real terms

P_1 = Suggested tax rate in real terms

P_0 = Existing tax rate in real terms

ε = elasticity of demand (-0.6)

[555] UK Department for Transport (2013) *UK Aviation Forecasts*, January, 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/223839/aviation-forecasts.pdf

Data on the existing number of flights was taken from the Eurostat database on '*National air passenger transport by reporting country*' and used as the tax base for the revenue calculations.[556] Projections for the number of flights out to 2025 were based upon historic trends. An estimate of the price of existing flights was taken for all countries, and is as follows:

- National €150 per flight
- Intra-EU €250 per flight
- Extra-EU €500 per flight

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

<u>Air-freight Taxes</u>

Data on existing levels of air-freight was taken from the Eurostat database on 'National freight and mail air transport by reporting country' and used as the tax base for the revenue calculations.[557] Projections for the volume of air-freight out to 2025 were based upon historic trends. For taxes on air-freight no literature on price elasticities was found, therefore to represent a reduction in the demand for air-freight a basic reduction of 5% was introduced in the model over the transition period from existing (or no) rates to maximum good practice rates.

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

A.2.4 Revenue Projections for Pollution and Resource Taxation

A.2.4.1 Waste Disposal Taxes

The latest revenue figures for waste disposal taxes, where these are in place and at a constant rate, were projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in waste disposal taxation is equal to the annual percentage change in real GDP growth.

<u>Non-hazardous Waste Landfill Tax (excluding construction and demolition wastes)</u>

For the good practice projections of revenues from non-C&D waste landfill taxes an elasticity based approach has been taken. The calculated price elasticity of demand for waste disposal shows some variation between different studies, but in general is relatively inelastic. One study from 1993 gathered data from 14 municipalities in the United States (including 10 municipalities that charged a unit-based price) over several

[556] Eurostat (2014) *National air passenger transport by reporting country* [avia_panc], Accessed 22th January 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=avia_panc&lang=en

[557] Eurostat (2014) *National freight and mail air transport by reporting country* [avia_gonc], Accessed 22nd January 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=avia_gonc&lang=en

years, and reported a price elasticity of -0.12.[558] This is comparable to that identified in a 1976 US study of -0.13.[559] A 1994 study used a household production model to simulate responses to different pricing schemes using calibration techniques. The authors estimated that the elasticity of demand for waste disposal services was in the range between -0.51 and -0.6.[560] A study in 2000, expanding on the 1976 study reported above, used a 1991 cross-section of 959 towns, of which 114 implemented user fees. A price elasticity of demand of -0.28 was identified.[561]

Based on the range identified above (from -0.12 to -0.6), using the approximate mid-point, we will apply a price elasticity of demand of -0.3.

The formula used for calculating the change in quantity of waste landfilled was as follows:

$$Q_1 = Q_0 \times ((\text{Landfill Gate Fee} + P_1) / (\text{Landfill Gate Fee} + P_0))^{\varepsilon}$$

Where:

Q_1 = Final quantity of waste landfilled

Q_0 = Initial quantity of waste landfilled

Landfill Gate Fee = Landfill gate fee in real terms

P_1 = Suggested tax rate in real terms

P_0 = Existing tax rate in real terms

ε = elasticity of demand (-0.3)

To calculate the tax base data from the European Reference Model on Municipal Waste (currently under development by Eunomia) was taken from the Business as Usual scenario. The figures were then factored up using data from Eurostat on the deposit into or onto land of all wastes excluding major mineral wastes in order to obtain future projections for the landfilling of all non-inert wastes in the countries (i.e. a ratio between total landfilling and landfilling of municipal waste only – the latter is only available from the European reference model).[562] The landfill gate fees used in the model are shown in Table 126.

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[558] Jenkins, Robin R (1993) *The Economics of Solid Waste Reduction*, Hants, England: Edward Elgar Publishing Limited

[559] Wertz, Kenneth L. (1976) Economic Factors Influencing Households' Production of Refuse, *Journal of Environmental Economics and Management*, Vol.2, pp. 263–272

[560] Morris, G.E., and Holthausen, D.M. (1994) The Economics of Household Solid Waste Generation and Disposal, *Journal of Environmental Economics and Management*, Vol.26, pp. 215–234

[561] Kinnaman, T., C., and Fullerton, D. (2000) Garbage and Recycling with Endogenous Local Policy, *Journal of Urban Economics*, Vol.48, pp. 419–442

[562] Eurostat (2014) *Waste excluding major mineral wastes*, http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/key_waste_streams/waste_excluding_major_mineral_wastes

Table 126: Gate Fees Used in the Model

Country	Landfill Gate Fee (pre-tax)	Incin. (pre-tax)	MBT
Austria	n/a	125*	95**
Belgium	50*	110*	95**
Czech Republic	16	46*	65**
Estonia	31	25	32
France	43	95	95**
Croatia	40 in Zagreb	80**	65**
Hungary	28	34	65**
Italy	90*	125*	95**
Lithuania	25	25	30
Poland	69.50*	100	90
Romania	3.7*	80**	65**
Slovakia	6.8*	80**	65**

Source: Eunomia Research & Consulting and Copenhagen Resource Institute (2014) European Reference Model for Municipal Waste Management, www.wastemodel.eu

Except:

** E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) Use of Economic Instruments and Waste Management Performances, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf , p.74-75 for incin, pp44-49 for landfill*

*** Expert judegment.*

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

Construction and Demolition Waste Landfill Tax

The basis for the calculated revenues from the tax on construction and demolition wastes is also data from Eurostat reported under the Waste Statistics Regulation

(Treatment of waste database).[563] The waste type 'Mineral waste from construction and demolition' was chosen to represent the tax base for a landfill tax on C&D waste. We recognise that this is an underestimate of the amount of C&D waste landfilled, other wastes such as soils, but also mixed C&D wastes (i.e. plastics, metals etc) will also be landfilled. However, data on treatment reported under the Waste Statistics Regulation does not categorise the waste by sector, therefore to avoid overestimating the revenue potential (which will not be significant for a tax of this nature anyway) we choose the above mentioned category only. Levels of landfilling of C&D wastes were assumed to remain constant for all future years as no robust estimates were available. There is less literature on the price elasticity of demand for C&D landfill services, therefore to represent a reduction in the demand for C&D wastes a basic reduction of 40% was introduced in the model over the transition period from existing (or no) rates to maximum good practice rates.

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

Incineration / MBT Tax

For the good practice projections of revenues from incineration / MBT taxes an elasticity based approach has been taken. The elasticity of demand used is the same as used in the method for the non-hazardous landfill tax (i.e. -0.3).

To calculate the tax base data from the European Reference Model on Municipal Waste (currently under development by Eunomia) was taken from the Business as Usual scenario. As some wastes from MBT plants ultimately end up in incineration plants in the same country, there is the potential for double counting of some tax revenues. To reflect this the tax base for MBT plants has been factored down by 25%.

The average gate fees for incineration and MBT plants used in the model are shown in Table 126.Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

A.2.4.2 Plastic Bags

Data on the consumption of single-use plastic bags was taken from the Assessment of the Socio-economic Costs and Benefits of Options to Reduce the Use of Single-use Plastic Carrier Bags in the EU was used as the tax base for the revenue calculations.[564] The baseline number of carrier bags were projected forward based upon annual GDP growth in real terms.

The Irish Plastic Bag Levy was introduced in March 2002. Initially the levy was set at €0.15 per bag. The tax is passed directly to consumers at the point of sale, and has thus been reported to provide a clearer, more consistent message than systems where

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[563] Eurostat (2013) *Treatment of waste*, Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en

[564] Eunomia (2012) *Assistance to the Commission to Complement an Assessment of the Socio-economic Costs and Benefits of Options to Reduce the Use of Single-use Plastic Carrier Bags in the EU*, Final Report to European Commission - DG Environment, 25th October 2012

retailers are responsible for the levy (such as in Denmark and South Africa. Prior to the implementation of the levy, 1.3 billion plastic bags were given away free of charge each year. This fell by over 90% in the first five months after the introduction of the levy.

On the basis of modelling a levy of €0.10 per bag (adjusted to national prices), we assume a slightly more conservative level of reduction, of 80%.

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

A.2.4.3 Other Pollution and Resource Taxes

The approach to calculating the revenue projections for the remaining pollution and resource taxes is broadly the same and so the general approach is described in this section, without repeating much of the detail. For these remaining taxes little data was easily available on either the price elasticity or the price of the product, making the calculations for change in demand difficult. Taking a pragmatic approach the reductions in demand were estimated based upon any *ex post* assessments on the effects of introducing environmental taxes, or by taking a simple reduction figure.

Data for the different tax bases comes from the following sources:

- **Air pollution**: Data from the European Environment Agency on emissions of air pollutants was used as the tax base for the revenue calculations.[565] Emissions for the following sectors only were included in the tax base:
  - Energy production and distribution (NFR 1A1a, b, c, 1A3e and 1B1a, b, c, 1B2a, b, c and 1B3)
  - Energy use in industry (NFR 1A2a, b, c, d, e, f)
  - Industrial processes (NFR 2A1-7, 2B1-5, 2C1-5 (except 2C4), 2D1-3, 2E, 2F, 2G)
  - Solvent and other product use (NFR 3A1-3, 3B1-2, 3C, 3D1-3)
  - Waste (NFR 6A, 6B, 6Ca-e, 6D)
- **Water abstraction:** Data on 'Annual freshwater abstraction by source and sector' (surface water and groundwater) was obtained from Eurostat as the tax base for the revenue calculations.[566]

[565] Eurostat (2013) *Air pollution (source: EEA)* [env_air_emis], Accessed, 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_air_emis&lang=en

[566] Eurostat (2014) *Annual freshwater abstraction by source and sector* [env_wat_abs], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wat_abs&lang=en

- **Waste water:** Data taken from EEA on urban waste water discharge.[567]
- **Pesticides:** Data on active ingredients in pesticides was taken from Eurostat and OECD sources as the tax base for the revenue calculations.[568] However, the latest year available from Eurostat was 2008 and not all countries were covered. For those countries with no data from the Eurostat or OECD databases, pesticide sales were estimated by taking an average figure per unit of GDP for the countries with data available and multiplying by GDP in the countries concerned.
- **Fertilisers:** Data on 'Use of inorganic fertilizers [aei_fm_usefert]' was obtained from Eurostat as the tax base for the revenue calculations.[569]
- **Aggregates:** Data on the following categories of aggregates was obtained from Eurostat material flow accounts as the tax base for revenue calculations:[570]
    - Marble;
    - Chalk and dolomite;
    - Slate;
    - Limestone and gypsum;
    - Sand and gravel.
- **Packaging:** Data reported to Eurostat under the Packaging and Packaging Waste Directive was used as the tax base for the revenue calculations.[571]

All tax base data was projected forwards to 2025 based upon historic trends.

For air pollution some evidence on the effects of taxes on air emissions were available. In Sweden the charge on NOx emissions (€1,600 per tonne) from industrial boilers is automatically and fully refunded to the industries that paid the tax on the basis of their energy use. This has led to a large number of abatement investments, fuel switching and other measures that reduced emission coefficients by about 50% within just 5 years for the 190 large plants that were first targeted.[572]

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[567] EEA (2013) *Urban waste water treatment (CSI 024) - Assessment published Jan 2013*, http://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-3

[568] Eurostat (2014) *Pesticide sales (1997-2008)*, Accessed, 20th December 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=AEI_FM_SALPEST

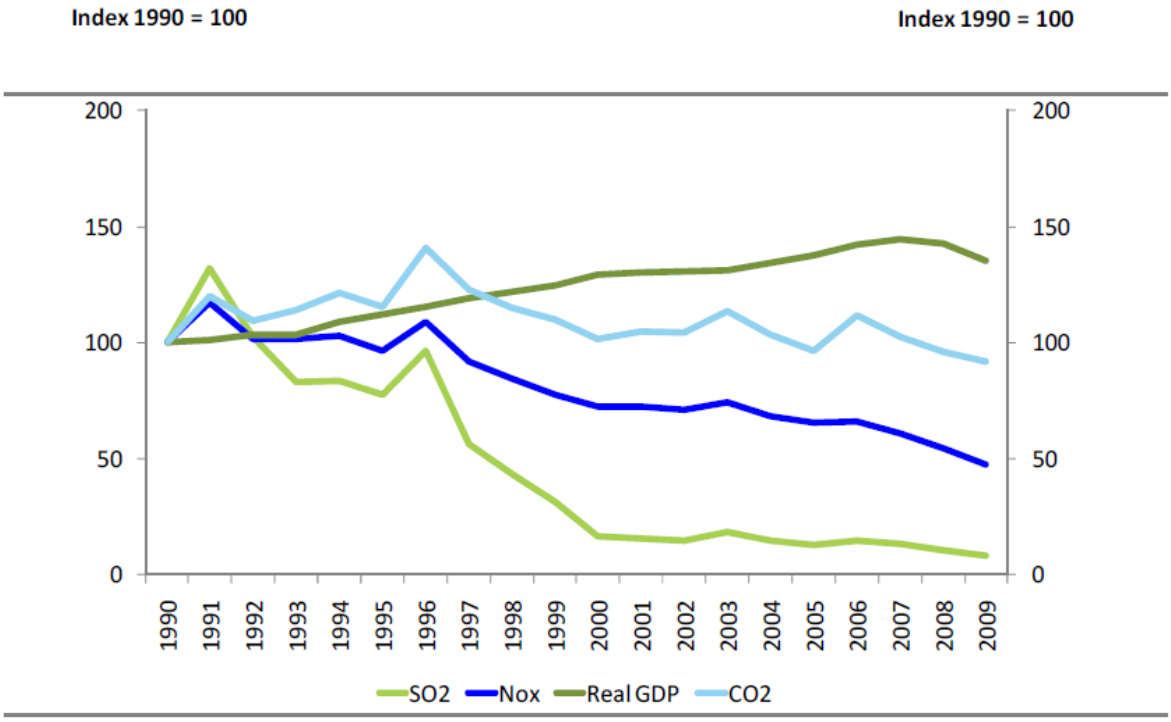
[569] Eurostat (2013) *Use of inorganic fertilizers*, [aei_fm_usefert], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=aei_fm_usefert&lang=en

[570] Eurostat (2013) *Material flow accounts* [env_ac_mfa], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_mfa&lang=en

[571] Eurostat (2013) *Packaging waste* [env_waspac], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_waspac&lang=en

In addition, as can be seen in Figure 21, emissions of SO_2 in Denmark dropped considerably between 1996 and 1997, and then again further between 1997 and 2000. However, the extent to which this is due to the tax on SO_2 alone is not clear.

Figure 21: Danish Emissions of NOx, SO_2 and CO_2



Source: Danish Skatreministeriet, 2011

For the purposes of this study we assume a 20% reduction in emissions of air pollutants from stationary sources after the level of the tax reaches good practice rates.

Also in Denmark a water supply tax was introduced in 1993. The current Danish rate equates to just over €0.70 per m^3. The main environmental aim of the tax was to reduce household consumption of water, which had increased through the 1980s, reaching a peak in 1989. From 1989 to 1998 consumption decreased from 360 million m^3 to 266 million m^3, i.e. by about 26 per cent. About half of the reduction took place prior to the introduction of the water tax, with the remaining half since its inception. There are no studies which explore the precise effect of the tax but it is thought likely to represent less than a 13 per cent reduction since 1994. We assume a 10% reduction in the abstraction of waste from any source for this study.

Table 127 indicates the remaining assumptions used in the model to estimate some reduction in demand based upon increase to good practice rates.

Table 127: Assumptions for Reduced Demand of Products and Services

	Max Reduction
Waste Water Discharge Tax	-10%
Pesticides Tax	-5%
Aggregates	-40%
Packaging Tax	-5%
Fertiliser Tax	-5%

The latest revenue figures for the any other pollution and resource taxes were projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in taxation is equal to the annual percentage change in real GDP growth.

A.3.0 Indirect Benefits

A.3.1 Damage Costs for Air Pollutants

The set of data that we have used for the assessment of the externalities associated with emissions to air is based on modelling recently undertaken for the European Environment Agency (EEA).[573] Table 128 and Figure 123 present the assumptions used in the model for the pollutants affecting air quality, reflecting the damage to human health (the damage costs were updated in the model to 2013 prices).

Reflecting the approach taken in Estimating Revenues based upon the proposed ETD, a carbon price of EUR 20 per tonne of CO_2 eq was used to reflect the externalities associated with emissions of greenhouse gases. The figure was kept constant in real terms out to 2025.

[573] The methodology used is summarised in: European Environment Agency (2011) *Revealing the Costs of Air Pollution from Industrial Facilities in Europe*, EEA Technical Report No 15/2011, November 2011

Table 128: Damage Costs Applied to the Air Pollutants (2010 Prices) – Key Air Pollutants

Country	NH3	NOx	PM2.5	PM10	SO2	VOCs
Croatia	€ 15,583	€ 5,326	€ 25,322	€ 16,443	€ 8,033	€ 1,007
Austria	€ 15,696	€ 12,383	€ 30,569	€ 19,850	€ 10,094	€ 812
Belgium	€ 27,980	€ 8,566	€ 44,388	€ 28,823	€ 11,392	€ 1,980
Czech Republic	€ 1,372	€ 665	€ 13,288	€ 8,629	€ 1,441	-€ 49
Estonia	€ 8,011	€ 3,919	€ 11,231	€ 7,293	€ 4,835	€ 735
France	€ 4,639	€ 1,470	€ 7,333	€ 4,762	€ 3,024	€ 253
Hungary	€ 5,214	€ 1,694	€ 18,724	€ 12,158	€ 3,238	€ 62
Italy	€ 2,420	€ 4,109	€ 15,656	€ 10,166	€ 5,960	€ 642
Lithuania	€ 5,882	€ 3,106	€ 9,961	€ 6,468	€ 4,570	€ 381
Poland	€ 20,319	€ 7,970	€ 40,980	€ 26,610	€ 13,180	€ 1,432
Romania	€ 4,806	€ 1,389	€ 24,644	€ 16,002	€ 3,682	€ 331
Slovakia	€ 7,722	€ 9,256	€ 21,448	€ 13,927	€ 6,323	€ 162

Table 129: Damage Costs Applied to the Air Pollutants (2010 Prices) – Heavy Metals

Country	Arsenic	Cadmium	Chromium	Nickel	1, 3 Butadiene	Benzene	PAH	Form-aldehyde	Dioxins/furans
Croatia	€ 349,000	€ 23,000	€ 31,000	€ 3,100	€ 390	€ 60	€ 1,309,000	€ 160	€ 28,000,000
Austria	€ 369,000	€ 29,000	€ 39,000	€ 4,000	€ 500	€ 80	€ 1,315,000	€ 220	€ 28,000,000
Belgium	€ 435,000	€ 50,000	€ 67,000	€ 6,700	€ 840	€ 120	€ 1,332,000	€ 360	€ 28,000,000
Czech Republic	€ 371,000	€ 30,000	€ 40,000	€ 4,100	€ 500	€ 80	€ 1,315,000	€ 220	€ 28,000,000
Estonia	€ 301,000	€ 8,300	€ 11,000	€ 1,100	€ 140	€ 30	€ 1,296,000	€ 60	€ 28,000,000
France	€ 390,000	€ 33,000	€ 49,000	€ 4,800	€ 610	€ 90	€ 1,320,000	€ 270	€ 28,000,000
Hungary	€ 368,000	€ 29,000	€ 39,000	€ 3,800	€ 480	€ 70	€ 1,314,000	€ 210	€ 28,000,000
Italy	€ 380,000	€ 33,000	€ 44,000	€ 4,400	€ 540	€ 80	€ 1,317,000	€ 240	€ 28,000,000
Lithuania	€ 316,000	€ 13,000	€ 17,000	€ 1,700	€ 220	€ 40	€ 1,300,000	€ 90	€ 28,000,000
Poland	€ 358,000	€ 26,000	€ 35,000	€ 3,500	€ 430	€ 70	€ 1,312,000	€ 190	€ 28,000,000
Romania	€ 339,000	€ 20,000	€ 27,000	€ 2,700	€ 330	€ 50	€ 1,306,000	€ 140	€ 28,000,000
Slovakia	€ 366,000	€ 28,000	€ 38,000	€ 3,700	€ 470	€ 70	€ 1,313,000	€ 210	€ 28,000,000

A.3.2 Energy

A.3.2.1 Marginal sources of Electricity and Heat Generation

The model used data on the electricity and heat generation mix from the International Energy Agency (IEA) and European Commission. Table 130 shows the energy mix for each of the 12 countries included in this study. Some of the data included in this table comes directly from Member States and was obtained as part of Eunomia's work in developing the European Reference Model on Municipal Waste Management.[574]

Table 130: Electricity Generation Mix, 2011

Member State	Coal	Gas	Nuclear	Renewables[1]	Other[2]
Austria	7.29%	17.88%	0.00%	72.00%	2.83%
Belgium	6.74%	32.13%	51.76%	7.02%	2.35%
Croatia	25.99%	0.00%	0.00%	48.01%	25.99%
Czech Rep.	59.20%	1.19%	33.08%	6.32%	0.21%
Estonia[3]	0%	2%	0%	9%	89%
France[3]	5%	4%	78%	10%	2%
Hungary[3]	18%	30%	44%	2%	5%
Italy	14.84%	50.32%	0.00%	24.61%	10.23%
Lithuania	0.00%	60.38%	0.00%	28.30%	11.32%
Poland[4]	100%	0%	0%	0%	0%
Romania	34.16%	12.05%	19.14%	33.50%	1.16%
Slovakia	16.35%	7.53%	53.84%	19.59%	2.69%

Notes:

1. *1. Includes biofuels and biomass.*
2. *2. Includes oil and waste.*
3. *3. Fuel mix data supplied by Member State as part of work undertaken by Eunomia in developing the European Reference Model on Municipal Waste Management.*

4. Marginal source data supplied by Member State as part of work undertaken by Eunomia in developing the European Reference Model on Municipal Waste Management.

[574] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Sources: IEA Statistics (available from www.iea.org/stats/); European Commission Country Factsheets, Available from http://ec.europa.eu/energy/observatory/countries/doc/2012-country-factsheets.pdf

Table 131 presents the heat mix for each of the 12 Member States under consideration. These rates were used in the model and are based on data from IEA and feedback directly from Member States which was received as part of Eunomia's work in developing the European Reference Model for Municipal Waste Management.[575]

Table 131: Heat Generation Mixes, 2011

Member State	Coal	Gas	Oil	Biomass	Other
Austria	5%	44%	10%	33%	9%
Belgium	0%	86%	0%	2%	12%
Croatia	0%	0%	0%	0%	0%
Czech Rep.	68%	23%	2%	2%	4%
Estonia[1]	0%	42%	26%	31%	0%
France	10%	61%	16%	0%	13%
Hungary	13%	76%	6%	2%	3%
Italy	1%	60%	35%	3%	3%
Lithuania[1]	0%	73%	3%	23%	1%
Poland[1]	0%	31%	18%	51%	0%
Romania	25%	64%	9%	2%	0%
Slovakia	23%	53%	12%	6%	7%

Notes

1. Fuel mix data supplied by Member State as part of work undertaken by Eunomia in developing the European Reference Model on Municipal Waste Management.

Sources: IEA Statistics (available from www.iea.org/stats/); European Commission Country Factsheets, Available from http://ec.europa.eu/energy/observatory/countries/doc/2012-country-factsheets.pdf

[575] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model on Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

A.3.2.2 Emissions Factors

The emissions factors used to estimate the impacts of electricity generation for the different generation sources considered within the model are shown in Table 133. Table 134 presents the emissions factors which have been used to estimate the impacts of heat generation.

Table 135 presents the emissions factors used for diesel combustion. The source of the emissions data is the ecoinvent database, which includes for the majority of fuels a dataset considered to be representative of European facilities.

Where required the conversion factors shown in Table 132 were used to convert to MWh.

Table 132: Conversion Factors to Convert Energy Units to MWh

Fuel Type	Unit	kWh
Oil (Heavy Fuel Oil)	billion litres	11,080,000,000
Kerosene	billion litres	9,695,000,000
LPG	million tonnes	12,714,300,000
Natural Gas	1,000 TJ	277,777,000
Coal	million tonnes	7,105,050,000

Source: 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting, www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting

Table 133: Emissions Factors for Electricity Generation (tonnes pollutant per kWh)

Fuel Type	CO_2e	NH_3	NOx	PM	SO_2	VOCs	Arsenic	Cadmium
Gas	4.00E-04	1.4034E-10	2.5304E-07	1.275E-09	1.6263E-09	1.5578E-09	2.76E-15	2.3269E-15
Coal	8.00E-04	2.6636E-10	7.1098E-07	2.428E-09	4.1141E-08	1.6624E-08	6.735E-12	1.7428E-12
Nuclear	1.00E-06	1.4504E-10	3.8024E-09	6.398E-10	1.6195E-08	1.8067E-10	2.006E-13	3.1833E-13
Renewables	1.00E-06	3.675E-11	8.6228E-09	1.619E-09	1.3942E-08	2.3682E-09	3.126E-13	8.2309E-14
Fuel Type	**Chromium**	**Nickel**	**1, 3 Butadiene**	**Benzene**	**PAH**	**Formaldehyde**	**Dioxins/furans**	
Gas	1.2903E-16	2.2382E-12	2.0709E-19	1.7024E-12	2.4785E-13	1.9003E-12	6.3519E-19	
Coal	1.3353E-13	1.4377E-11	6.5556E-19	1.0881E-14	6.5846E-13	2.996E-11	1.5426E-18	
Nuclear	8.9085E-15	6.4668E-12	1.3962E-18	1.6996E-11	2.5287E-13	1.0827E-11	4.2164E-19	
Renewables	3.0718E-14	2.623E-12	6.548E-19	2.8188E-11	2.1087E-13	5.3271E-12	3.6474E-18	

Source: Source: Ecoinvent Centre (2007) Ecoinvent Data v2.2. Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

Table 134: Emissions Factors for Heat Generation (tonnes pollutant per kWh)

Fuel Type	CO_2e	NH_3	NOx	PM	SO_2	VOCs	Arsenic	Cadmium
Gas	0.2	2.97E-11	1.37E-07	1.18E-09	9.53E-09	1.09E-09	1.47E-13	9.46E-14
Coal	0.3	1.52E-10	9.13E-07	1.82E-07	2.27E-06	8.03E-09	1.14E-10	7.35E-12
Nuclear	0.25	6.47E-11	1.23E-07	5.97E-09	2.35E-07	2.22E-09	1.31E-12	2.95E-12
Renewables	0.001	8.31E-09	7.31E-07	5.61E-07	1.73E-08	5.19E-08	4.91E-12	3.47E-12
Fuel Type	**Chromium**	**Nickel**	**1, 3 Butadiene**	**Benzene**	**PAH**	**Formaldehyde**	**Dioxins/furans**	
Gas	6.94E-15	4.75E-12	6.74E-18	1.46E-09	3.65E-11	3.72E-10	1.36E-18	
Coal	1.02E-10	9.36E-11	1.21E-17	2.28E-09	5.38E-13	3.79E-10	9.08E-17	
Nuclear	1.95E-14	3.59E-11	2.13E-18	6.37E-10	1.95E-12	3.59E-11	9.77E-19	
Renewables	2.00E-13	3.06E-11	1.41E-17	4.38E-09	5.33E-11	6.27E-10	1.59E-16	

Source: Source: Ecoinvent Centre (2007) Ecoinvent Data v2.2. Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

Table 135: Emissions Factors for Diesel Combustion (tonnes per litre)

	CO_2e	NH_3	NOx	PM	SO_2	VOCs	Arsenic	Cadmium
Diesel	0.00026	6.83E-10	1.30E-06	5.78E-08	2.48E-06	2.34E-08	1.39E-11	3.12E-11
	Chromium	Nickel	1, 3 Butadiene	Benzene	PAH	Formaldehyde	Dioxins/furans	
Diesel	2.06E-13	3.79E-10	2.25E-17	6.73E-09	2.05E-11	3.79E-10	1.03E-17	

Source: Ecoinvent Centre (2007) Ecoinvent Data v2.2. Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

The externalities from emitting air pollutants from vehicles at ground level are higher than when emitted from industrial facilities (Table 128 and Table 129 relates to the latter). However, there is evidence on the damages from emissions from vehicles. Brandt et al provide some tables with external costs of HGVs in Member States (see Table 136).[576] These are in the order of 4 /5 times greater than those in Table 128 and Table 129 above.

above. This is reflected in the modelling of air pollution externalities from transport.

Table 136: Unit Costs of Air Pollutants, €/kg

Unit costs of air pollutants		$PM_{2.5}$	N	NOx
		€/kg	€/kg	€/kg
AT	Austria	46.656	59.022	17.963
BE	Belgium	82.991	48.345	14.714
BG	Bulgaria	30.941	39.132	11.910
CH	Switzerland	70.860	88.693	26.994
CY	Cyprus	3.263	5.897	1.795
CZ	Czech Republic	50.388	48.863	14.871
DE	Germany	62.981	60.142	18.304
DK	Denmark	25.182	29.769	9.060
EE	Estonia	15.351	16.434	5.002
EL	Greece	23.620	22.486	6.844
ES	Spain	25.992	26.271	7.996
FI	Finland	12.605	11.469	3.491
FR	France	47.489	56.983	17.343
HU	Hungary	52.613	53.859	16.392

[576] Brandt, J., Silver, J. D., Gross, A. & Christensen, J. H. (2010) *Marginal Damage Cost per unit of Air Pollution Emissions*, Roskilde: National Environmental Research Institute. 23 p. Specific agreement 3555/B2010/EEA.54131 implementing framework contract ref. no. EEA/IEA/09/002.

Unit costs of air pollutants		$PM_{2.5}$	N	NOx
IE	Ireland	27.070	36.308	11.050
IT	Italy	48.584	58.838	17.907
LT	Lithuania	20.513	28.783	8.760
LU	Luxembourg	61.534	60.581	18.438
LV	Latvia	17.932	21.760	6.623
MT	Malta	7.085	8.692	2.645
NL	Netherlands	86.140	51.402	15.644
NO	Norway	13.755	17.881	5.442
PL	Poland	46.547	43.428	13.217
PT	Portugal	37.078	14.725	4.481
RO	Romania	40.816	61.353	18.673
SE	Sweden	18.021	20.342	6.191
SI	Slovenia	37.238	53.076	16.154
SK	Slovakia	44.665	49.917	15.192
TR	Turkey	23.325	19.733	6.006
UK	United Kingdom	61.544	40.188	12.231

A.3.3 Transport

A.3.3.1 Vehicles

The approach to calculating good practice revenues was to assume a benchmark % of GDP. This approach therefore did not include any analysis of the number of types of vehicles in use in the countries, or how the behavioural patterns or drivers (and consumers) would change following increases in the level of vehicle taxation. However, taxes of the type being suggested, with incentives to choose and use vehicles with lower emissions, would be expected to deliver some behavioural change, albeit that any effect might take several years to occur (because the change relates to the nature of the vehicle stock). In order to reflect some environmental

benefits a proxy to increases in efficiency and change in driver behaviour was factored into the model. The assumption was that national petrol and diesel consumption would fall by 10% by the time the full increase of the vehicle taxes had come into effect (by 2020), for the country with the greatest reduction. The fall in consumption for the other countries was pro-rated based upon the relative increases in vehicle taxes. So a country which only increased vehicle taxes by one half of the maximum would only see a reduction in consumption of 5%.

The method for valuing the change in emission was the same as described above.

A.3.3.2 Aviation

The model differentiates between three types of journeys:

1. National – journeys within a single country;
2. Intra-EU – journeys within the European Union; and
3. Extra-EU – journeys outside of the European Union.

The amount of carbon emitted by passengers per km travelled on different types of journeys is summarised in Table 137. This table also shows the assumed distance that is seen to be typical of the three types of journeys.

Table 137: Tonnes of Carbon Emitted per km for Passenger Flights and Average Distances Travelled

Type of Journey	Tonne CO_2eq per km
National	1.67E-04
Intra-EU	9.52E-05
Extra-EU	1.09E-04
Type of Journey	**Average Distance per Journey (km)**
National	463
Intra-EU	1,108
Extra-EU	6,482

Source: UK Department of Environment, Food and Rural Affairs (2012) 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting, www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting

The amount of carbon emitted per tonne of freight transported on national, intra-EU, extra-EU flights is summarised in Table 138.

Table 138: Tonnes of Carbon Emitted per km for Freight

Type of Journey	Kg CO_2eq per km
National	2.06
Intra-EU	1.24
Extra-EU	0.64
Type of Journey	**Average Distance per Journey (km)**
National	463
Intra-EU	1,108
Extra-EU	6,482

Source: 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting, www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting

A.3.4 Resource Taxes

A.3.4.1 Diversion of Waste from Landfill

The externalities associated with landfilling various waste streams are summarised in Table 139. These were calculated during the development of the European Reference Model on Municipal Solid Waste Management.[577]

Table 139: Externalities Associated with Landfilling per Material (Euro, 2013 Real Term Prices)

Year	Food	Garden	Paper	Wood	Textiles	Fines	Other
2011	€ 39	€ 41	€ 45	€ 70	€ 67	€ 29	€ 31
2012	€ 39	€ 41	€ 46	€ 71	€ 67	€ 29	€ 31
2013	€ 39	€ 41	€ 47	€ 72	€ 68	€ 29	€ 32
2014	€ 39	€ 42	€ 48	€ 74	€ 69	€ 29	€ 32

[577] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Year	Food	Garden	Paper	Wood	Textiles	Fines	Other
2015	€ 39	€ 42	€ 48	€ 75	€ 70	€ 29	€ 32
2016	€ 39	€ 43	€ 49	€ 76	€ 71	€ 30	€ 32
2017	€ 40	€ 43	€ 50	€ 78	€ 72	€ 30	€ 33
2018	€ 40	€ 44	€ 51	€ 80	€ 73	€ 30	€ 33
2019	€ 40	€ 44	€ 53	€ 82	€ 74	€ 30	€ 33
2020	€ 41	€ 45	€ 54	€ 84	€ 76	€ 31	€ 34
2021	€ 41	€ 46	€ 55	€ 86	€ 77	€ 31	€ 34
2022	€ 42	€ 47	€ 57	€ 88	€ 79	€ 31	€ 35
2023	€ 43	€ 48	€ 58	€ 91	€ 81	€ 32	€ 35
2024	€ 43	€ 49	€ 60	€ 94	€ 83	€ 33	€ 36
2025	€ 45	€ 50	€ 62	€ 97	€ 86	€ 33	€ 37
2026	€ 46	€ 52	€ 64	€ 100	€ 89	€ 34	€ 38
2027	€ 47	€ 54	€ 67	€ 104	€ 91	€ 35	€ 40
2028	€ 49	€ 56	€ 69	€ 107	€ 95	€ 37	€ 41
2029	€ 51	€ 58	€ 72	€ 111	€ 98	€ 38	€ 43
2030	€ 53	€ 60	€ 74	€ 116	€ 102	€ 40	€ 44

The assumed composition of residual waste in the countries under consideration in this study is shown in Table 140.

Table 140: Assumed Residual Waste Composition used in the Model

Material	Proportion
Food	25%
Garden	10%
Paper	15%
Wood	5%
Textiles	5%
Fines	3%
Other	3%
Inerts	35%
Total	**100%**

The reduction in the amount of inert waste going to landfill can save 0.0134 tonnes of $CO_{2\ eq}$ per tonne of waste diverted. This figure is based on the provided by PE International and was used to assess the environmental impacts associated with diverting inert wastes from landfill once a landfill tax on construction and demolition waste is introduced.[578]

A.3.4.2 Diversion of Waste from Incineration and MBT

Data from WRATE shows that the incineration of 1 tonne of residual waste can result in 0.567 tonnes of $CO_{2\ eq}$ being emitted.[579] Thus, in situations where an incineration tax is introduced and waste is diverted from incineration it is assumed that this quantity of $CO_{2\ eq}$ is avoided for every tonne of waste diverted.

Given that MBT recovers some materials recycling the process actually results in a net benefit relative to landfilling. For materials sent to MBT, rather than to landfill, 0.012 tonnes of $CO_{2\ eq}$ can be saved per tonne of waste processed.[580] Where a tax causes waste to be diverted away from MBT the model assumes that this benefit if

[578] PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

[579] UK Environment Agency (2014) *Waste and Resources Assessment Tool for the Environment (WRATE)*, www.environment-agency.gov.uk/research/commercial/102922.aspx

[580] UK Environment Agency (2014) *Waste and Resources Assessment Tool for the Environment (WRATE)*, www.environment-agency.gov.uk/research/commercial/102922.aspx

forgone. However, the benefits associated with recycling are far greater. This is not reflected in the model as it would require one to understand the current waste management systems in all the countries considered, and thus is a conservative estimate of the environmental benefits associated with reduced landfilling.

A.3.4.3 Water Abstraction and Effluent Treatment

For the purposes of modelling the impacts of water extraction and treatment a figure from PE International was used.[581] According to this source every m^3 of water abstracted and treated results in the emission of 0.00073 tonnes of $CO_{2\ eq}$.

A.3.4.4 Pesticides

For the impact of pesticides on the environment data was taken from the Ecoinvent database. This database indicates that one tonne of pesticide is associated with 10.1 tonnes of $CO_{2\ eq}$.[582]

A.3.4.5 Aggregates

Data on the impact of sand and gravel quarrying and processing on the environment was obtained from the PE International. This source indicates that every tonne of aggregate extracted results in 0.002 tonnes of CO_{2eq} being emitted.[583]

A.3.4.6 Packaging

Data on the climate change impacts of the production of packaging materials was taken from the WRATE database and is summarised in Table 141.

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[581] PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

[582] Ecoinvent Centre (2007*) Ecoinvent Data v2.2,* Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

[583] PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

Table 141: Environmental Damages Associated with Production of Different Packaging Materials

Packaging Material	Tonne CO_{2eq} per Tonne of Packing Material
Paper and card	0.30
Plastic	1.18
Wood	0.00
Metals (combined)[1]	4.35
Non-ferrous metals	1.62
Ferrous metals	10.72
Glass	0.09
Note: 1. Assumes a 70%/30% split between ferrous/non-ferrous metals.	

A.3.4.7 Single Use Plastic Bags

For the purposes of modelling the impact of single use plastic bags on the climate, data was extracted from the PE International database. This data suggests that every tonne of polyethylene film is associated with the emission of 2.4 tonnes of $CO_{2\ eq}$.[584] It was assumed that an average single use plastic bag weighs 8.5g.

A.3.4.8 Fertilisers

Data on the climate change impact of fertilisers was taken from the Ecoinvent database, which indicates that every tonne of nitrogen fertiliser is associated with the emission of 5.3 tonnes of $CO_{2\ eq}$.[585]

A.3.4.9 Omissions

The above analysis concentrates only on emissions of greenhouse gases, and other air pollutants. The major omissions are related to those activities where the main benefits are not experienced in these terms. Key omissions from the above analysis are, therefore:

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[584] PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

[585] *Ecoinvent Centre (2007)* Ecoinvent Data v2.2, *Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org*

1. The wider suite of impacts of improved water flows and enhanced water quality;
2. The wider benefits from reduced use of pesticides and fertilisers;
3. Disamenity effects from:
    a. Avoidance of litter through reduced littering of plastic bags;
    b. Reduced landfilling;
    c. Reduced incineration / MBT
    d. Reduced extraction of aggregates.

The analysis is, therefore, incomplete, but highlights some of the benefits expected to flow from the taxes.

A.4.0 Environmental Fiscal Reform and Employment

Even before the financial downturn in 2008 there was significant interest in environmental tax policies which can promote sustainable economic growth and increase employment.[586] The protracted economic recovery has further stimulated interest in environmental tax reform which has now become a core objective of the European Commission. The Roadmap to a Resource Efficient Europe, for example, includes the following objective:

> *"By 2020 a major shift from taxation of labour towards environmental taxation, including through regular adjustments in real rates, will lead to a substantial increase in the share of environmental taxes in public revenues, in line with the best practice of Member States"*. [587]

Since the Roadmap's publication in 2011 a number of reports have been issued by the Commission focusing on the need for EFR as means of promoting sustainable growth.[588] This chapter examines some of the research that has been conducted in the area of EFR and its impact on employment.

In 1991 Pearce suggested that environmental taxation could lead to a *'double dividend'* as well structured schemes could help to curb harmful environmental activities and at the same time boost employment opportunities.[589] According to a recent review the rationale behind this claim was the idea that:

> *"...environmental taxes not only produce improvements in the environment but they also generate substantial amounts of government revenue. This new revenue allows governments to reduce the rates of other taxes in the economy while maintaining a constant level of total revenue and expenditure".*

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[586] See for example: European Commission (2007) *Green Paper on Market-Based Instruments for Environmentally and Related Policy Purposes*, COM(2007) 140 final, http://ec.europa.eu/environment/enveco/green_paper.htm; European Environment Agency (2005) Market-Based Instruments for Environmental Policy in Europe, www.eea.europa.eu/publications/technical_report_2005_8

[587] European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm, p. 11.

[588] See for example: European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf; European Commission (2012) *Tax Reforms in EU Member States 2012: Tax Policy Challenges for Economic Growth and Fiscal Sustainability* ; and European Commission (2011) *Taxation Papers – Quality of Taxation and the Crisis: Tax Shifts from a Growth Perspective*, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_29_en.pdf

[589] Pearce, D. (1991) The Role of Carbon Taxes in Adjusting to Global Warming, *Economic Journal*, Vol. 101, pp. 938-948.

Employment can be increased either directly through private actors responding to the tax by finding innovative ways to reduce their tax burden (and therefore pollution), or indirectly through Government offsetting the revenue raised by the environmental tax against taxes on labour.[590] Although it is widely accepted that EFR can help to stimulate employment (see Table 142), the degree to which this occurs is very much dependent on the specifics of the environmental tax being considered, how the revenues will be spent, and the employment/economic dynamics within a country (e.g. the size of the informal sector, extent of unemployment, and the flexibility of different elements of the labour force).

Over the last few decades a growing body of literature has emerged which has looked at the relationship between EFR and employment. Although a substantial amount of work has been done much of this is based on theoretical modelling as opposed to the gathering of empirical evidence (this may not be surprising given the difficulties of gathering empirical data and assigning cause and effect to a particular policy intervention). Nevertheless, the findings appear to be relatively consistent and suggest that gains in employment are likely to be achieved where offsetting reductions in other taxes are made. Some of these studies are summarised in Table 142 from where it can be seen that the majority of studies appear to show that there are slight gains in employment as a result of EFR; however, some studies have suggested that unemployment may rise as a result of environmental tax reform.

It is reasonably obvious that in terms of absolute levels of employment, it is better to recycle the revenues to create positive economic and social outcomes. On this point the EEA notes:

> *"The recycling of revenues is especially important for the acceptability and equity of the tax reforms. This is because shifting the burden of tax increases some costs and reduces others, and since no two individuals in society will have exactly the same earning and spending patterns, the impacts will vary".*[591]

Probably what matters rather more is not the effect of environmental taxes on absolute levels of employment, but the effects relative to most plausible counterfactual. If the most plausible counterfactual is the resort to taxes other than environmental ones to generate the same revenue, then it might be expected that the use of environmental taxes still has a positive effect relative to the alternatives.

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[590] European Environment Agency (2012) *Environmental Tax Reform in Europe: Opportunities for Eco-innovation*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-opportunities

[591] European Environment Agency (2012) *Environmental Tax Reform in Europe: Implications for Income Distribution*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-in-europe

Table 142: Short Summary List of Studies on EFR and Employment Outcomes

Nature of Study	Nature of the Environmental Tax	Distribution of Revenue	Impacts on Employment
Study uses QUEST model to analyse the impact of a consumption tax in the EU27.[592]	Consumption tax equal to 1% of GDP.	The tax is offset by a 1% reduction in labour taxes.	The central scenario showed employment increasing from 0.11% above the baseline in year 1 to 0.24% in year 10.
This paper models the impacts of a carbon tax in Germany.[593]	Introduction of a carbon tax on the non-ETS sector which increased incrementally to €68 per tonne in 2020.	The model assumes recycled through reductions in income tax and social security contributions.	The model projected an additional employment of 58,200 in 2010 relative to the baseline scenario (an increase of 0.2%). This increases 122,000 additional employment opportunities in 2015 (0.3% above the baseline), and 152,000 by 2020 (0.4% above the baseline).
Model to study the impact of an EU wide carbon tax such that would allow a 20% reduction in emissions by 2020.[594]	Carbon tax. The rate was varied for different model scenarios.	Different forms of revenue recycling were modelled under a number of scenarios.	The authors conclude that: *"Results show positive employment effects and only small negative impacts on GDP. Economic impacts depend on the level of international energy prices, the recycling mechanism, country specifics such as carbon and energy intensity and structure of energy consumption".*

[592] European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf, p. 49

[593] European Environment Agency (2012) *Environmental Tax Reform in Europe: Implications for Income Distribution*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-in-europe

[594] Lutz, C., and Meyer, B. (2010) Environmental Tax Reform in the European Union: Impact on CO2 Emissions and the Economy, *Zeitschrift Für Energiewirtschaft*, Vol.34, No.1, pp.1–10

Nature of Study	Nature of the Environmental Tax	Distribution of Revenue	Impacts on Employment
This paper models the impact of a carbon tax in Spain.[595]	An economy wide tax on CO_2. Different levels of tax were considered in this study.	The model included different scenarios each of which assumed that revenues were recycled in different ways: 1. via lump sum transfers; 2. via reducing income tax; and 3. by reducing taxes on capital (in all instances it was assumed that the proposed tax was revenue neutral).	The results were strongly related to the way in which the tax revenues were recycled back into the economy and the assumed flexibility of the labour market and the unemployed. With a carbon tax of US$62.40 per tonne – the amount deemed necessary to achieve a 15% reduction in CO_2 emissions - the model results suggest that unemployment could fall by 3.5% if revenues are used to reduce income tax (see cited reference for further details on the assumptions). When revenues were used to make lump sum payments or reduce taxes on capital it was found that unemployment may increase by 1.4%. Under these two scenarios, which also sought to reduce emissions by 15%, the CO_2 tax was lower at US$46 per tonne.
This paper models the impact of a carbon tax in Spain[596]	A 10% tax on all energy products and a 15% tax on petrol and other petroleum products		If the wage curve is assumed to be infinitely elastic the authors showed that unemployment could fall by 2.43% for a carbon tax of an estimated US$31.90 per tonne (the authors in the cited report provided this estimate). If the wage elasticity is assumed to be 0.15 then unemployment only falls by 0.65%. This suggests that the rate is likely to be somewhere between these two points.
A simple model to calculate the impact of the UK's Climate Change Levy on employment.[597]	This study looked at the UK Climate Change Levy that was introduced in 2001.	Not stated in the study.	The results of the study suggest that the following employment impacts could be expected in six sectors: • Food and Tabaco – 0.07% increase; • Rubber and plastics – 0.08% increase; • Non-metallic minerals – 0.13% decrease; • Machinery – 0.26% increase;

[595] Markandya, A., González-Eguino, M., and Escapa, E. (2012) *Environmental Fiscal Reform and Unemployment in Spain, BC3 Working Paper Series 2012-04*, Report for Basque Centre for Climate Change, April 2012

[596] Cited in the above study.

[597] Agnolucci, P. (2009) The Effect of the German and British Environmental Taxation Reforms: A Simple Assessment, *Energy Policy*, Vol.37, No.8, pp.3043–3051

Nature of Study	Nature of the Environmental Tax	Distribution of Revenue	Impacts on Employment
			• Electrical and optical equipment – 0.23% increase; and • Financial intermediation – 0.45% increase.
A simple model to calculate the impact of Germany's EFR on employment.[598]	A range of environmental taxes which were introduced in the late 1990s and early 2000s are considered as part of this analysis.	Reduction in the social security contributions made by employees and employers.	The results of the study suggest that the following employment impacts could be expected in four sectors: • Pulp, paper and printing – 0.82% decrease; • Rubber and plastics – 0.05% decrease; • Non-metallic minerals – 0.40% increase; and • Wholesale and retail trade – 0.04% decrease.
This paper models the employment double dividend in a segmented labour market in 15 Member States.[599]	Energy tax (based on carbon emissions). The study determines the 'optimal tax' for each Member State (€3 to €33 per tonne).	The model considers various mechanisms whereby revenues are recycled to reduce gross wages and increase employment (e.g. varying the distribution of the revenue between skilled and unskilled labour).	The authors of the study conclude that: *"i) an employment double dividend can be achieved in the short run only, even if a trade-off between environment and employment always exists; ii) the effect on employment is larger when the fiscal revenue is recycled into all workers' gross wages rather than into unskilled workers only; iii) a co-operative policy leads to even larger benefits in terms of employment provided that an adequate redistribution of fiscal revenues is adopted by EU countries".*

[598] Ibid.

[599] Bosello, F., and Carraro, C. (2001) Recycling Energy Taxes: Impacts on a Disaggregated Labour Market, *Energy Economics*, Vol.23, No.5, pp.569–594

The effects of EFR are most well documented in relation to energy and carbon taxes. Other forms of environmental taxes, such as resource taxes, or taxes on pollution, have received less attention. One reason for this is that the modelling studies have tended to address effects at the level of the macro-economy, whilst the level of revenue generation by some pollution and resource taxes is rather low (so that the net effects estimated by models are likely to lie within, or close to, their limits of resolution. The sections below examine, as far as is possible given the time constraints of this study, the employment impacts of a number of environmental taxes.

A.4.1 Energy/Carbon Taxes

Although slightly outdated, a compressive review in 2000 looked at 139 model simulations coming from a total of 59 studies.[600] Seventy-five of the 108 simulations which were reviewed for employment impacts (i.e. 73%) predicted that EFR would result in net job creation (Figure 22). The authors note that:

> "*...the best results in terms of employment are obtained when recycling occurs through cuts in SSC [social security contributions]. This is because employers' SSC directly influence the price of labour; the higher employers' SSC, the more costly it is to hire labour, similarly, the higher employees' SSC, the greater the disincentive to supply labour*".[601]

These employment impacts were also divided up by the time horizon of the modelled simulations. This showed, as demonstrated in Figure 23, that short to medium term projections have similar employment outcomes (again positive and negative impacts were identified - the latter, however, being less common).

The authors go on to say that:

> *"One important caveat is that for employment gains to materialize, the labour market must be flexible".*[602]

These authors also suggest that job losses may results if the revenue raised from EFR is not recycled in such a way as to offset the price rises:

> *"Indeed, certain models suggest that sharp increases in the real wage rate on account of higher energy and consumer prices must be prevented. The tax increase cannot be fully passed on to sales prices as the rest of the world is prepared to absorb only a fraction of the price increase. The rest must, thus, be split between domestic capital and labour. For jobs to be created, most of the residual cost increase will be borne by labour in the form of reductions in*

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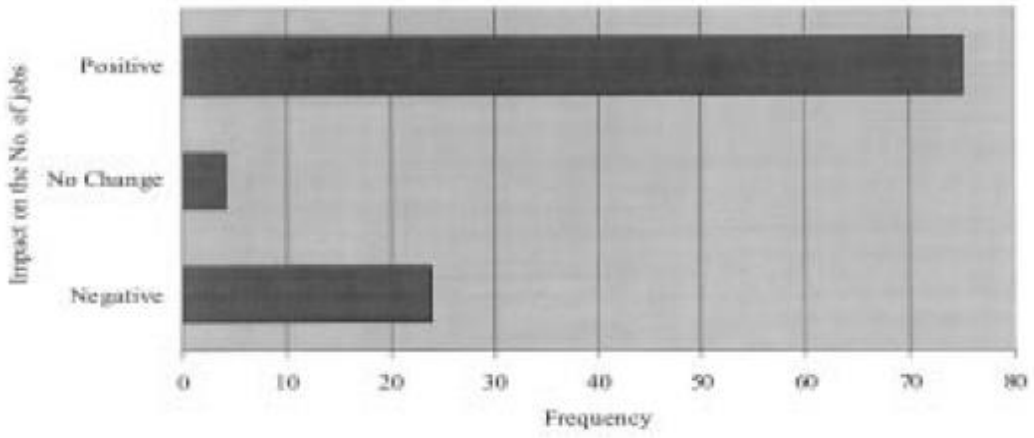
[600] Bosquet, B. (2000) Environmental Tax Reform: Does it Work? A Survey of the Empirical Evidence, *Ecological Economics*, Vol.34, No.1, pp.19–32

[601] *Ibid.,* p. 24

[602] *Ibid.,* p. 24

real wage costs. If, instead, wages are rigid, high losses of employment may result".[603]

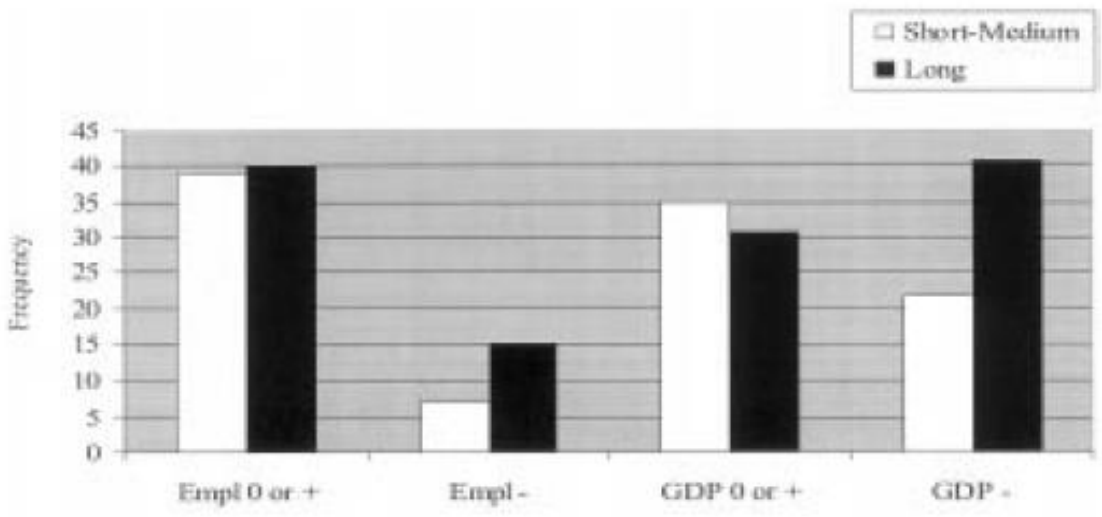
Figure 22: EFR and its Impact on Employment



Note: Based on 103 simulations. Positive means that EFR allows gains in employment. No change means that EFR causes neither gains no losses in employment. Negative means that EFR leads to losses in employment.

Source: Figure 2 in Bosquet, B. (2000) Environmental Tax Reform: Does it Work? A Survey of the Empirical Evidence, Ecological Economics, Vol.34, No.1, pp.19–32, p. 24

Figure 23: Time Horizon and Impact on Employment



Note: Based upon 46 short- to medium-term simulations of employment impact, 55 long-term simulations of employment impact, 57 short- to medium-term simulations of GDP impact, and 72 long-term simulations of GDP impact. 'Empl 0 or +' means positive or zero employment effect; 'Empl - ' means negative employment effect; 'GDP 0 or + ' means positive or zero GDP effect; 'GDP - ' means

[603] *Ibid.*, p. 25

negative GDP effect. Short- to medium term means less than 10 years; long-term means 10 years or more.

Source: Figure 3 in Bosquet, B. (2000) Environmental Tax Reform: Does it Work? A Survey of the Empirical Evidence, Ecological Economics, Vol.34, No.1, pp.19–32, p. 25

The paper concludes by saying that:

> *"Substantial empirical evidence exists on the predicted effect of ETR. This paper has reviewed 139 modelling simulations. The general findings are that reductions in carbon emissions may be significant, marginal gains in employment and marginal gains or losses in [economic] activity may be recorded in the short- to medium-term, and investments decrease and prices increase moderately".*[604]

A review of EFR conducted in 2005 updated the findings from the study discussed above. This work looked at a total of 186 model simulations from 61 separate studies.[605] These simulations were grouped according to different characteristics, for example, *"the type of economic model used, the length of the simulation period employed, and the type of environmental policies considered"*.[606] The results of this work are summarised in Table 143, from which it can be seen that, on average, all of the different groupings of studies predicted net job creation with significant reductions in CO_2 emissions. The authors stated that:

> *"…the magnitude of the environmental effect is much larger than the other effects. This difference suggests that, despite the importance attached to the economic aspect of ETR, ETR policies are more efficient on the environmental side than on the economic side. At the same time, it appears possible to improve the environment with a low or negligible variation in the economic sector".*[607]

The authors of the above cited study provide the following conclusion:

> *"We observed that the environmental effect of ETR is consistently evident in terms of CO_2 emissions reduction. The effects of ETR on the economy are, however, less clear and, undoubtedly, much smaller than the environment effects. The data show that it is possible to obtain a DD [double dividend] and maintain it over the long run. From [Table 143], it seems that an employment DD is uncontroversial, whereas the GDP DD shows mixed results. The result*

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[604] *Ibid.,* p. 29

[605] Patuelli, R., Nijkamp, P., and Pels, E. (2005) Environmental Tax Reform and the Double Dividend: A Meta-analytical Performance Assessment, *Ecological Economics*, Vol.55, No.4, pp.564–583

[606] *Ibid.,* p. 568

[607] *Ibid.,* p. 568

on the employment DD is robust with respect to long-term analyses and different model types".[608]

Table 143: Average Results (in %) of a Large Number of ETR Model Simulations

	CO_2 Emissions	Employment	GDP	Firm Investments	Consumer Prices
Average Variation	-9.70	0.44	-0.05	-0.23	1.18
Europe	-9.40	0.71	-0.07	-0.14	1.42
Rest of the World	-12.86	0.31	0.24	0.95	n.a.
Mediterranean Countries	-2.85	0.3	0.15	-0.58	2.7
Nordic Countries	-11.03	1.07	-0.03	-0.02	1.23
Short- to Medium-term Simulations	-6.02	0.44	0.06	-0.42	1.23
Long-term Simulations	-13.08	0.97	-0.05	0.48	1.17
EC Tax	-6.39	0.33	0.01	-0.85	1.69
Other Taxes	-11.22	0.85	-0.07	0.38	0.97
SSC Recycling[1]	-7.99	1.04	0.15	0.24	1.2
Other Recycling	-12.10	0.05	-0.17	-0.16	1.72
Macroeconomic Model	-7.57	0.46	-0.12	-0.86	1.51
General Equilibrium model	-12.89	1.06	0.26	0.73	0.38
Journal/Book Papers	-11.85	0.79	0.22	0.37	1.33
Non-Published Papers	-7.40	0.48	-0.06	-0.51	1.2

Notes: 1. SSC = Social Security Contributions

Source: Table 1 in Patuelli, R., Nijkamp, P., and Pels, E. (2005) Environmental Tax Reform and the Double Dividend: A Meta-analytical Performance Assessment, Ecological Economics, Vol.55, No.4, pp.564–583, p. 569

As discussed above, this paper also highlights the importance of recycling the revenues to help offset price rises or wage inflation. In this regard it is noted that:

> *"The usual formulation of ETR, with a carbon/energy tax recycled through SSC reductions, continues to be a valid model, which could produce the above-mentioned DD (viz. a better environment and more jobs). Our meta-analysis showed a significant and positive effect, generated on employment, by the CO_2 tax/SSC recycling policy combination. However, these results still need to be properly tested against different model specifications".*[609]

As might be expected, the outcomes of the model projections which have looked at the impact of EFR on employment are very much dependent on the explicit and

[608] *Ibid.*, p. 577

[609] *Ibid.*, p. 577

implicit assumptions made when setting up the model scenarios and choosing the type of model that will be used.[610,611] Thus, although the consensus appears to be that there is a clear double dividend in relation to energy/carbon taxes it is important to bear in mind that the results of these studies can vary quite significantly at times.

The 2011 Impact Assessment which was developed to support the proposed amendments to the Energy Taxation Directive (Directive 2003/96/EC) (ETD) used the E3ME model (developed by Cambridge Econometrics) and the QUESTIII model to assess the impact of various EFR options on GDP and employment.[612] As part of the modelling the impacts of various energy and carbon taxes were examined. The results of the E3ME modelling showed that the *"impact on employment is positive in all options and in all Member States"*.[613] However, it is noted that:

> *"This positive impact on GDP and employment is driven by the modelling assumption that additional revenue from energy taxation would be used to reduce the employers' social security contributions. Lower labour costs boost employment and decrease domestic price levels increasing private consumption. This assumption reflects the practices of many Member States which have carried out environmental tax reforms (cf. Annex 2, point 5) and is in line with the general orientation in the ETD itself (recital 11), which promotes the principle of tax neutrality as a means to modernise national tax systems in favour of both the environment and employment"*.[614]

The QUESTIII modelling was undertaken to determine if the effects of the recent financial crisis and protracted economic recovery have altered the case for EFR. The results showed that there was still a strong case for reform, but that Member States may want to consider how the revenues from the energy taxes were recycled back into the economy. The impact of different approaches to revenue recycling on GDP and employment are shown Table 144. The results if this table are summarised as follows:

> *"When revenue is recycled via lump-sum payments to households or is retained in the public budget to reduce public debt, the positive economic impacts would not materialise. However, the modelling showed that the impacts of fiscal consolidation via a carbon tax would be slightly better than effects of lump-sum*

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[610] Anger, N., Böhringer, C., and Löschel, A. (2010) Paying the Piper and Calling the Tune?: A Meta-Regression Analysis of the Double-Dividend Hypothesis, *Special Section: Ecosystem Services Valuation in China*, Vol.69, No.7, pp.1495–1502

[611] Berck, P., and Hoffmann, S. (2002) Assessing the Employment Impacts of Environmental and Natural Resource Policy, *Environmental and Resource Economics*, Vol.22, No.1-2, pp.133–156

[612] For a more detailed discussion of these models see Annex 2 of the IA, p. 59

[613] European Commission (2011) Impact Assessment on the Proposal for a Council Directive Amending Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity, http://ec.europa.eu/taxation_customs/resources/documents/taxation/sec_2011_409_impact_assessment_part1_en.pdf, p. 28

[614] *Ibid.,* p. 29

tax recycling. Use of revenue is a matter for Member States to decide and will also depend on how Member States would implement any possible ETD revision".[615]

Table 144: GDP and Employment Effects from Carbon Taxes (Percent Deviation from Baseline)

Parameter	Labour Tax Recycling		Lump-sum Tax Recycling		Fiscal Consolidation	
	2020	2030	2020	2030	2020	2030
GDP	0.014	0.028	-0.082	-0.099	-0.085	-0.062
Employment	0.028	0.036	-0.122	-0.158	-0.087	-0.098

Source: European Commission (2011) Impact Assessment on the Proposal for a Council Directive Amending Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity, http://ec.europa.eu/taxation_customs/resources/documents/taxation/sec_2011_409_impact_assessment_part1_en.pdf*, Table 17, p. 30.*

The Impact Assessment on the Energy Taxation Directive goes on to say:

> *"Member States might need to raise taxes in order to carry out fiscal consolidation in any event.*[616] *Increasing labour taxes – as an alternative to fiscal consolidation via a carbon tax - would be more distortive, hindering job creation and economic activity even more.*[617] *In addition, the beneficial impact on the energy mix and the environment would not materialise and other measures (possibly costlier) would have to be taken to achieve the climate policy targets. So, the overall results would be worse compared to fiscal consolidation via a carbon tax that combines environmental benefits with certain short to medium term economic costs"* (footnotes are included in the original).[618]

Further work by Pollitt *et al*. has looked at the impact of carbon taxation on employment when the revenues are used for budget consolidation and are not

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[615] *Ibid.,* p. 30.

[616] "For more details see Monitoring tax revenues and tax reform in the EU Member States 2010, European Commission Taxation papers (working paper 24/2010)".

[617] "Various studies have shown that taxes on income are usually associated with lower economic growth (and so lower steady-state GDP) and that property and consumption taxes (including environmentally related taxes) are the least detrimental to growth. See e.g.. Johannson, A., Heady, C., Brys, B. and L. Vartia (2008), Taxation and Economic Growth, OECD Economics Department Working Papers, 620, OECD publishing. Arnold, J. (2008), Do Tax Structures Affect Aggregate Economic Growth?: Empirical Evidence from a Panel of OECD Countries, OECD Economics Department Working Papers, No. 643, OECD Publishing. Myles, G. D. (2009), Economic Growth and the Role of Taxation – Aggregate Data, OECD Economics Department Working Papers, No. 714, OECD publishing".

[618] *Ibid.,* p. 30.

recycled back into the economy. The authors (who used Cambridge Econometrics' E3ME model) showed that using carbon taxes to plug fiscal deficits can lead to reduced employment; however, they argue that the increase in unemployment resulting from carbon taxes would be less than if the money were raised through labour taxes. The authors conclude that:

> *"Recognising that raising tax revenues typically reduces GDP, the tax portfolio ought to be weighted towards tax bases associated with the lowest macroeconomic costs. This paper has shown that, at both national and European level, energy and carbon taxes (ETS at EU level) perform well in comparison to direct and indirect taxes, when assessing their impacts on GDP and employment. This is due to a combination of factors, but notably the opportunity to reduce the bill for fossil fuel imports as well as different labour market dynamics. The findings for the three case study countries should hold for all countries with a large dependency on imported fuel"*.[619]

The work cited above is based on a detailed report undertaken by Vivid Economics and published in 2012.[620] Interested readers are referred to this report and the cited journal article for further details.

The above research was built upon in a subsequent report and further supported the idea that energy taxes may be an efficient way of raising revenue relative to conventional taxes. The authors of the follow on study state:

> *"A review of current carbon-energy taxes across a sample of nine EU member states reveals a great discrepancy in the tax rates used within and across countries. Without a common set of signals, various economic problems can emerge, from inappropriate investments in fuels and technologies, to carbon and economic leakage between countries and, ultimately, overall loss of welfare.*
>
> *Raising or adjusting national taxes on energy and carbon can help to correct these discrepancies, while generating useful revenues that can contribute to fiscal re-balancing. The analysis compares such carbon-related taxes with conventional direct and indirect taxes raising similar amounts of revenue. It reveals that carbon fiscal measures can indeed raise significant revenues while having less detrimental macro-economic impact than other tax options".*[621]

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[619] Pollitt, H., Zhao, Y., Ward, J., Smale, R., Krahe, M. and Jacobs, M. (2012) The Potential Role for Carbon Pricing in Reducing European Deficits, Global Policy Essay, Vol. 3 (3), pp. 1-22

[620] Vivid Economics (2012) *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, Report for the European Climate Foundation and Green Budget Europe, May 2012

[621] Jacobs, M., Ward, J., Smale, R., Krahé, M. and Bassi, S. (2012) *Less Pain, More Gain: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, November 2012, Report for Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change & the Environment,

From the above it would appear that energy taxes can play a key role in helping to reduce carbon emissions, while at the same time provide an efficient means for raising revenues, which can either be used for the purposes of fiscal consolidation or for boosting employment by offsetting the revenue gained against labour taxes.

A.4.2 Waste Taxes

A brief search was conducted on the impacts of landfill tax on employment. Unfortunately, the body of literature in this area appears to be very limited.

Shortly after the landfill tax was implemented in the UK, an ex ante assessment of the employment impact of the tax only, as predicted by Cambridge Econometrics, suggested the effect was relatively small. In the case of an escalating tax, with revenue used to fund offsetting reductions in employer social security contributions, net employment generation was estimated at 7,200 in 1997, 21,000 in 2000 and 36,200 in 2005 for the whole UK economy. The study noted, importantly, that if the revenue is not used to offset reductions in employer social security contributions, there is still a net employment gain. The contribution of the revenue refunding mechanism over the 'tax only' scenario (representing structural adjustment owing to the changes set in place) was estimated at 1,600 in 1997, and still only 4,700 by 2005 under an escalating tax scenario

This resonates with the way in which responses to landfill taxes tend to occur. It is fairly uncontroversial that landfill taxes help to divert waste away from landfill to other forms of residual waste treatment and/or recycling (Figure 24).[622,623] Research into the employment intensity of different waste treatment options clearly indicates that, per tonne of waste treated/disposed, landfilling produces the least number of job opportunities. Indeed, the number of job opportunities appear to increase as one moves up the waste hierarchy. For example, for every 10,000 tonnes of waste disposed of in landfill, one job may be created, compared to between 2 and 67 for recycling. Table 145 and Table 146 provide a summary of the employment intensities (FTEs per 10,000 tonnes per annum) associated with various waste treatment and disposal operations.

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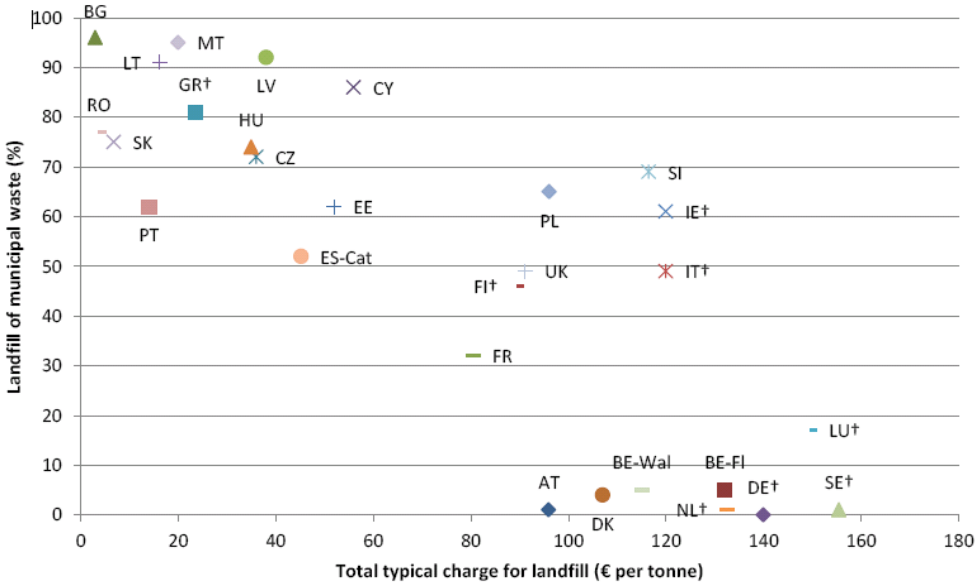
http://www.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PP-carbon-pricing-europe-fiscal-deficits.pdf, p. 3

[622] Bio Intelligence Service with IEEP, Eunomia, Ecologic, Arcadis and Umweltbundesamt (2012) *Use of Economic Instruments and Waste Management Performances*, April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

[623] The individual country reports produced by the EAA have shown how the quantity of waste going to landfill falls significantly with the introduction of well-priced landfill taxes. See: European Environment Agency (2013) *Managing Municipal Solid Waste - a Review of Achievements in 32 European Countries, February 2013,* www.eea.europa.eu/publications/managing-municipal-solid-waste

Figure 24: Municipal Waste Landfilling and Landfill Costs



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Source: Figure 20 in Bio Intelligence Service with IEEP, Eunomia Research & Consulting, Ecologic, Arcadis and Umweltbundesamt (2012) Use of Economic Instruments and Waste Management Performances, April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf, p. 55

Table 145: Employment Intensities from Various Literature Sources (FTEs per 10,000 tonnes per annum)

Study	Landfill	Incinerator	MBT	Composting Sites	Windrow	In-vessel	AD	MRF	Recycling Collection	Residual Waste Collection	Reprocessing	Reprocessing: Glass/ Aluminium	Reprocessing: Plastics
SWAP, 1997 (UK) [624]								28			3-67	3-11	67
Murray, 1999 (UK) [625]	≈1	≈1							21–40	6	2		
Lepu, 2004 (UK) [626]								18			4-19	4	
Seldman, 2006 (USA) [627]	1	1		4				10			25	26	93
WRAP, 2012 (UK) [628]			5		2		2						
Eunomia, 2012 (EU) [629]					4		2	11					
TBU and Eunomia, 2003 [630]			2 - 3										

[624] Save Waste and Prosper (SWAP) (1999) *Employment in the UK Recycling Industry*, National Recycling Forum.

[625] Murray, R. (1999) *Creating Wealth From Waste*, DEMOS, www.demos.co.uk/files/Creatingwealthfromwaste.pdf

[626] Gray, A., Jones, A., and Percy, S. (2004) *Jobs from Recycling: Report on Stage II of the Research*, Report for Local Economic Policy Unit (Lepu), August 2004, http://warrr.org/446/1/Jobs_from_recycling__-__Report.pdf

[627] Seldman, N. (2006) *Recycling Means Business.* PhD Institute for Local Reliance, Waste to Wealth Program, www.ilsr.org/recycling/recyclingmeansbusiness.html

[628] Urban Mines and Walker Resource Management (2012) *A Survey of the UK Organics Recycling Industry in 2010,* Report for WRAP, www.organics-recycling.org.uk/uploads/article2439/ASORI%20Final%20Report%202010.pdf

[629] Eunomia's micro study on employment conducted as part of the European Reference Model on Municipal Waste Management, www.wastemodel.eu

[630] TBU and Eunomia (2003) *Cool Waste Management,* Report for Greenpeace, www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/5574.pdf

Study	Landfill	Incinerator	MBT	Composting Sites	Windrow	In-vessel	AD	MRF	Recycling Collection	Residual Waste Collection	Reprocessing	Reprocessing: Glass/ Aluminium	Reprocessing: Plastics
University of Glamorgan, 2007 (AU) [631]			5										
Greenpeace, 2009 [632]		5											
Cottica & Kaurlard, 1995 [633]	≈1	2-4											
DETR/DTI, 1999 (UK) [634]								15-30					
European Commission, 2006 [635]											12		
Various											16	3 –5	70

Notes: Figures are rounded to nearest integer. It is important to note that whilst Seldman's study was published in 2006, the data was collected in 1997.

[631] University of Glamorgan (2007) *Kahlenberg (ZAK) MBT Plant*, www.walesadcentre.org.uk/Controls/Document/Docs/Kahlenberg_Comp__F.pdf

[632] Greenpeace (2009) *Incineracion de Residuos: Malos Humos para el Clima*, November 2009, www.greenpeace.org/espana/Global/espana/report/costas/091124-02.pdf

[633] Cottica & Kaurlard (1995) The Costs, Environmental Benefits, and Direct Employment Implication of Greening Municipal Waste Management in Europe: An Engineering Estimation, NOMISA, Bologna

[634] Cited in Waste Watch, (1999) *Jobs from Waste: Employment Opportunities in Recycling*, http://wasteonline.brix.fatbeehive.com/resources/WasteWatch/JobsFromWaste.htm

[635] European Commission (2006) Report from the Commission to the Council and the European Parliament on the Implementation of Directive 94/62/EC on Packaging and Packaging Waste and its Impact on the Environment as well as on the functioning of the Internal Market, www.europen.be/download_protected_file.php?file=109

Table 146 - Employment Intensity of Recycling from Friends of the Earth Report, 2010 (FTEs per 10,000 tonnes per annum)

Material	2004	2020	Average	Source
Glass	7.5	7.5	8	European Data
Paper	35	18	27	European Data
Plastic	156	93	125	European Data
Iron & Steel	54	54	54	European Data
Aluminium	110	110	110	European Data
Wood	7.5	7.5	8	European Data
Textiles	50	50	50	European Data
Biowaste	13	4	9	European Data
Mixed Metal	65.2	65.2	65	European Data
WEEE	-	-	400	UK Data
Furniture	-	-	140	UK Data

Source: Friends of the Earth (2010) More Jobs, Less Waste: Potential for Job Creation Through Higher Rates of Recycling in the UK and EU, September 2010, www.foe.co.uk/sites/default/files/downloads/jobs_recycling.pdf

Recent work by Cambridge Econometrics investigated the likely impacts of waste taxes on GDP and employment in the European Union. As part of this work they looked at seven scenarios:

1. A tax of €50 per tonne on municipal waste to landfill;
2. Number 1 + €50 per tonne tax on waste from construction waste to landfill;
3. Number 2 + €50 per tonne tax on other mineral waste to landfill;
4. Number 3 + €50 per tonne tax on all other waste to landfill;
5. A tax of €50 per tonne on discharges to water;
6. A tax of €25 per tonne on waste that is incinerated without energy recovery; and
7. Number 4+5+6 (i.e. all of the above).

The modelling assumed that the mining sector was compensated in full for all of the taxes on mineral waste. For all of the other taxes it was assumed that the revenues were used to offset labour taxes (employers' social contributions). The results of the modelling are summarised in Table 147. It is important to note that the modelling takes a very broad macroeconomic approach and used very crude estimates to model waste flows and how they may be altered as a result of the taxes. For example, it was assumed that 50% of all non-mining waste diverted from landfill would go to incineration and the other 50% would be recycled/recovered. The authors of the report acknowledged that this is an *"arbitrary figure"* that could be improved upon in the future.[636]

Table 147: Cambridge Econometrics Summary Results for the EU28 in 2020 (Unless Stated Otherwise all Figures shown as % Difference from Baseline)

Parameter	Scenario						
	1	2	3	4	5	6	7
Revenue (€2005 million)	3,689	5,276	30,627	30,966	2,842	648	34,680
GDP	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Employment	0.01	0.02	0.04	0.04	0.00	0.00	0.04
Household Consumption	-0.01	0.00	0.01	0.01	0.00	0.00	0.00
Investment	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.01
Exports	0.00	0.00	-0.03	-0.03	-0.01	0.00	-0.03
Imports	0.00	0.00	-0.01	-0.01	0.00	0.00	-0.01
Consumer Prices	0.01	0	0.02	0.02	0.01	0	0.03
Waste Generation	-1.53	-2.36	-10.28	-10.47	-0.78	-0.42	-11.67

Source: Cambridge Econometrics (2013) Modelling Milestones for Achieving Resource Efficiency: Economic Analysis of Waste Taxes, Report for DG Environment of the European Commission, November 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Task%203-waste.pdf, Table 4.1, p. 17.

In terms of the impact on employment Cambridge Econometrics notes that there is:

> *"…a small but noticeable increase in employment. The potential 0.04% increase in total EU employment translates to around 100,000 jobs. This is driven by the use*

[636] Cambridge Econometrics (2013) *Modelling Milestones for Achieving Resource Efficiency: Economic Analysis of Waste Taxes*, Report for DG Environment of the European Commission, November 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Task%203-waste.pdf, footnote 9, p. 13

of the revenues to reduce labour taxes and lower the cost of employment; although there will be some new jobs in the waste processing sector, the net increase in employment comes from a range of different economic sectors".[637]

Given the employment intensities discussed above (Table 145 and Table 146) it is clear that the degree to which waste is pushed up the hierarchy will have a significant impact on employment. Some of the high level assumptions made as part of Cambridge Econometric's modelling may not accurately reflect the actual levels of material recovery/recycling that may be achieved as a result of landfill and incineration taxes which will no doubt force materials up the waste hierarchy. The figure of 100,000 jobs may therefore be a conservative estimate.

The above analysis shows that there can be employment benefits derived from waste taxes in Europe.

A.4.3 Taxes on Aggregates

The Danish Raw Materials Tax was introduced in 1990 and at the time of an extensive review by ECOTEC *et al* in 2001 it had been held steady at DKK5.00 per m^3. In terms of the tax's impact on Employment ECOTEC *et al* state that:

> *"No figures are available but the effect of the tax is so minimal that no effects would be expected unless coming from the recycling of demolition wastes (used for construction and at sea), but this is mainly due to the waste tax".* [638]

With regards to Sweden's aggregates tax the authors of the above report state the following:

> *"It is unknown to what extent the Gravel tax has affected the aggregates industry. Whilst gravel pits may have shut, the overall labour involved with the industry may have remained stable. It seems likely that the relatively low labour intensity of the industry would make it likely that the net impact of the tax might be positive in employment terms as the use of these funds for public expenditure would be more employment intensive".*[639]

Again the rate of Sweden's aggregate tax was very low at the time the review was undertaken and had also been held constant at SEK5.00 (€0.57) since it started in 1996 and the time of the review in 2000.[640]

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[637] *Ibid.*, p. 18.

[638] ECOTEC, CESAM, CLM, University of Gothenburg, UCD, and IEEP (2001) *Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States*, Report for DG Environment, European Commission, April 2001, http://ec.europa.eu/environment/enveco/taxation/pdf/ch1t4_overview.pdf, p. 193.

[639] *Ibid.,* p. 205.

[640] *Ibid.,* p. 198.

ECOTEC *et al* examined other resource taxes, such as the Danish Water Supply Tax[641] and the Dutch Groundwater Tax[642], but reported that no information was available on the impact that these tax have had on employment. However, with regards to the Danish tax, ECOTEC *et al* do report that although the impacts have not been quantified, anecdotal evidence suggests that:

> *"The tax has a positive influence on employment, in particular for sanitary engineering companies, which renovate water installations. New products have been developed and are being marketed such as new types of water-saving sanitations, in particular low-flush toilets".*[643]

Efforts were made to identify more recent studies on the employment impacts of resource taxes; however, information on this subject is sparse and it was not possible to gather a robust database as part of this limited review.

A.4.4 Pesticide Taxes

Denmark introduced a pesticide tax in 1996 as part of a broader strategy of reducing the amount of pesticide use in the country. The tax rate in 1998 was 53.85% of the retail price for insecticides and 33.33% of the retail price for fungicides and herbicides (no differentiation was made on the basis of toxicity). Writing in 2001 ECOTEC *et al* report the following:

> *"Given the marginal nature of changes thus far, the (expected) implications for employment would not be expected to be significant. Demand for pesticides (measured in tonnes) has fallen but this reflects, in part, changes unrelated to the pesticides tax per se. Note that since, as we understand the situation, the majority of Danish production of pesticides is exported, the employment impact on domestic industry of any tax-related reduction in demand is also likely to be small".*[644]

Under more extreme forms of taxes one would expect greater job losses and ECOTEC *et al* cite Bichel's (1999) work on this. They report that:

> *"Banning the use of pesticides in Denmark would reduce the employment in the agricultural sector by 16000 employees. Reducing pesticide consumption by 80% would reduce employment by 8000 employees. The optimisation scenario 3 (approximately 50% reduction in use) would have no or very limited employment effects given a 10 year implementation period. This suggests that given the tax's broad intention to refund revenue to the sector through land tax reductions, the current level of tax would not affect employment significantly".*[645]

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[641] *Ibid.,* p. 73.

[642] *Ibid.,* p. 70.

[643] *Ibid.,* p. 73.

[644] *Ibid.,* p. 367.

[645] *Ibid.,* p. 367. At the time farming employed around 84,000 people in Denmark – 3.5% of the workforce.

A.5.0 Austria: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

A.5.1 Energy

- Tax on mineral oils:
  - Taxes on mineral oils are set according to the type and use of the fuel. Levies on petrol and diesel include a specific CO_2 tax of €20/tonne.[646]
  - Rates: see Table 162 for details of rates.
  - Main exemptions:[647]
    - Mineral oil not intended for use as a motor or heating oil
    - Mineral oil used by commercial air transport
    - Pure biofuels
  - Partial reimbursement is paid for fuel used for combined heat and power generation. Partial reimbursements for agriculture and railways was abolished on 1 January 2013.[648]
  - Revenue in 2012: €4.2 billion (equivalent to 1.4% of GDP)[649]

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[646] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/measureDetail.html?id=641

[647] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=825/1357119636&taxType=Energy+products+and+electricity

[648] European Commission (2013) *Excise Duty Tables*, Accessed 2 December 2013, pp. 8-47, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[649] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

- Energy levies:[650]
  - Levies on energy other than mineral oils are also in place in Austria. This covers electricity, natural gas and coal, coke and lignite. One rate is set per fuel, regardless of the final user.
  - Electricity:
    - Rate (2013): €15.00/MWh
    - Revenue in 2012 (gross): €920 million (equivalent to 0.30% of GDP)[651]
  - Natural gas:
    - Rate (2013): €66.00/1000 m^3, equal to 1.66/GJ
    - Revenue in 2012 (gross): €340 million (equivalent to 0.11% of GDP).[652]
  - Coal / Coke / Lignite:
    - Rate (2013): €50.00/1000 kg, equal to €1.70/GJ.
    - Revenue in 2012 (gross): €20 million (equivalent to 0.0065% of GDP).[653]
  - Energy Tax reimbursements: companies whose main activity is the production of goods are reimbursed for taxes paid on electricity, natural gas, coal and mineral oil used for heating purposes above 0.5% of the companies' turnover. The company must as a minimum pay tax rates equal to the minimum rates set by the EU Energy Tax Directive.[654]
    - Revenue in 2012 (gross): €-450 million (equivalent to -0.15% of GDP).[655]
  - Revenue in 2012 (net): €831 million (equivalent to 0.27% of GDP).[656]

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[650] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=825/1357119636&taxType=Energy+products+and+electricity

[651] Source: Expert ('National Accounts') BMF, Head of tax estimation (Rainer Pilz)

[652] *Ibid.*

[653] *Ibid.*

[654] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=825/1357119636&taxType=Energy+products+and+electricity

[655] *Ibid.*

[656] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014,

Table 148: Details on Mineral Oil Taxes (Austria, 2013)[657]

General tax base	Specific tax base (I)	Specific tax base (II)	Tax rate
Petrol (per 1000 litres)	Unleaded	With a minimum biofuel content of 4.6% by volume and sulphur content below 10 mg/kg	€482.00
		Without biofuel and/or high sulphur	€515.00
	Leaded	With a minimum biofuel content of 4.6% by volume and sulphur content below 10 mg/kg	€554.00
		Without biofuel and/or high sulphur	€587.00
Gas oil (per 1000 litres)	Propellant / Commercial & Industrial	With a minimum biofuel content of 6.6% by volume and sulphur content below 10 mg/kg	€397.00
		Without biofuel and/or high sulphur	€425.00
	Heating (all users)	With a sulphur content below 10 mg/kg	€98.00
		With a high sulphur content	€128.00
Kerosene (per 1000 litres)	All Uses		€397.00
Heavy fuel oil (per 1000 kg)	Heating (all users)	N/A	€60.00

http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[657] European Commission (2013) *Excise Duty Tables*, Accessed 2 December 2013, pp. 8-47, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

General tax base	Specific tax base (I)	Specific tax base (II)	Tax rate
Liquid Petroleum Gas (per 1000 kg)	Propellant / Commercial & Industrial	N/A	€261.00
	Heating (all users)	N/A	€43.00

A.5.2 Transport (excl. transport fuels)

- Registration Taxes:
  - Duty on vehicles based on fuel consumption ("Normverbrauchsabgabe" ["NoVA"])[658]
    - This tax is paid one-off at the time of purchase or lease of a new passenger car in Austria (or at the time of registration of a vehicle imported into Austria).
    - The tax is based on the net purchasing price of the vehicle as well as its fuel consumption. The tax is added to the vehicle at the time of purchase and VAT is paid on both the net purchasing price and the vehicle duty.
    - In addition, a bonus/malus system applies to take account of vehicles' NO_x and CO_2 emissions.
    - Rates are outlined in Table 163.
    - Main exemptions: Non-passenger vehicles, electric vehicles, ambulances, taxis and motorcycles with an engine size less than 125 ccm.
    - Revenue in 2012: €505 million (equivalent to 0.17% of GDP)[659]
  - Car registration tax ("Kraftfahrzeugszulassungssteuer"):
    - This is a one-off registration tax that is paid on all vehicles registered in Austria, in addition to NoVA. It is a flat-rate tax collected by the central government.
    - Rate (2013): €119.80 per vehicle

[658] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=16/1357119635&taxType=Other+indirect+tax

[659] See Table 2 in Statistik Austria (2012) *Umweltgesamtrechnungen: Modul Oeko-Steuern (Zeitreihe 1995 bis 2011)*, 2012, page 12, http://www.statistik.at/web_de/statistiken/energie_und_umwelt/umwelt/oeko-steuern/

- Revenue in 2011 (the latest year for which figures are available): €172 million (equivalent to 0.06% of GDP).[660]

Table 149: Duty on Vehicles Based on Fuel Consumption (Austria, 2013)[661]

Basic Tax Rate				
General tax base	Specific tax base (I)	Minimum	Basic tax rate calculation	Maximum
New (or not previously registered in Austria) passenger cars	Petrol-driven cars	N/A	(Fuel consumption in litres/100 km – 3) x 2% of net purchasing price	16% of the net purchasing price
	Diesel-driven cars	N/A	(Fuel consumption in litres/100 km – 2) x 2% of net purchasing price	16% of net purchasing price
New (or not previously registered in Austria) motorcycles	Motorcycles with an engine size greater than 125 ccm	N/A	(Engine size in ccm – 100) x 0.02% of net purchasing price	N/A
Bonus				
General tax base	Specific tax base (I)	Minimum	Basic tax rate calculation	Maximum
All passenger cars	CO_2 emissions less than 120 g/km	N/A		€300.00
Un-leaded passenger cars	NO_x emissions less than 60 g/km	N/A		€200.00
Diesel-engined cars	NO_x emissions less than 80 g/km and	N/A		€200.00

[660] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[661] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=16/1357119635&taxType=Other+indirect+tax

Basic Tax Rate				
General tax base	Specific tax base (I)	Minimum	Basic tax rate calculation	Maximum
	particle emissions less than 0.005 g/km			
Malus				
General tax base	Specific tax base (I)	Minimum	Basic tax rate calculation	Maximum
Diesel-driven cars	Particle emissions greater than 0.005 g/km		€300.00	
All passenger cars	CO_2 emissions between 150 – 170 g/km	€0.00	€25 per additional g/km CO_2 emissions above 150	€500.00
	CO_2 emissions between 170 - 210 g/km	€500.00	€500.00 + €50 per additional g/km CO_2 emissions above 170	€2.500.00
	CO_2 emissions above 210 g/km	€2.500.00	€1000.00 + €75 per additional g/km CO_2 emissions above 210	N/A

- Circulation Taxes:
  - Motor vehicles tax 1 ("Kraftfahrzeugsteuer"):[662]
    - This is a monthly tax on vehicles with a total weight of more than 3.5 tonnes as well as on smaller vehicles that have no mandatory third-party insurance (vehicles with mandatory third-party insurance are covered by Motor vehicles tax 2).
    - Rates for motor vehicles up to 3.5 tonnes total weight (2013):

[662] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=14/1329868800&taxType=Other+indirect+tax

        - Monthly payment of €0.55 per kilowatt of the engine rating above 24 kilowatts (based on annual payments)
        - Minimum rate is €0.60 per month. Maximum rate is €66.00 per month for vehicles other than passenger and combination cars.
        - Supplements apply for semi-annual, quarterly or monthly payments (6%, 8% or 10%, respectively).
    - Rates for motor vehicles with more than 3.5 tonnes total weight (2013):
        - Total weight up to 12 t: monthly payments of €1.55 / tonne.
        - Total weight between 12 – 18 t: €1.70 / tonne.
        - Total weight more than 18 t: €1.90 / tonne.
        - Minimum rate is €15.00 per month. Maximum rate is €80.00 per month (€66.00 per month for trailers).
    - Exemptions apply for electric vehicles, vehicles used in official services such as ambulances, vehicles used by people with disabilities, taxis, buses and coaches.
    - Revenue in 2012: €45 million (equivalent to 0.015% of GDP)[663]
- Motor vehicles tax 2 ("Motorbezogene Versicherungssteuer"):[664]
    - This is a monthly tax on vehicles subject to mandatory third-party insurance with a total weight of less than 3.5 tonnes.
    - Rates (2013):
    - Monthly payment of €0.55 per kilowatt of the engine rating above 24 kilowatts (based on annual payments)
    - Minimum rate is €0.60 per month. Maximum rate is €66.00 per month for vehicles other than passenger and combination cars.
    - Motorcycles: €0.022 per ccm (engine size).
    - Supplements apply for semi-annual, quarterly or monthly payments (6%, 8% or 10%, respectively).
    - Exemptions apply for electric vehicles, vehicles used in official services such as ambulances, vehicles used by people with

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[663] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[664] European Commission (2013) *Taxes in Europe Database*, Accessed 13 December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=15/1357119635&taxType=Other+indirect+tax

disabilities, taxis, buses, coaches and motorcycles with an engine size less than 100 ccm.

- Revenue in 2012: €1.7 billion (equivalent to 0.55% of GDP).[665]

- Aviation Taxes:
  - Flight charge ("Flugabgabe")[666]
    - A tax is paid per passenger on flights departing from within Austria. Three rates are charged, depending on the destination of the flight. This tax was introduced in 2011 and rates were lowered in 2012. Rates applying in 2013 are as follows:
    - Short haul flight (European destinations): €7.00 / passenger
    - Medium-haul flight (to destinations in the Middle East and parts of Africa): €15.00 / passenger
    - Long-haul flight (all other destinations): €35.00 / passenger
    - Exemptions are in place for:

i. The departure of passengers under two years old and who do not have their own seat.

ii. The departure of persons belonging to the flight crew, or flown as a flight crew member of another flight to their destination, or from their site.

iii. The departure for training purposes or for the purpose of parachute jumping

iv. The departure exclusively for military, medical or humanitarian purposes.

v. The departure of transit and transfer passengers after a stopover at a domestic airport, which has led to a scheduled stopover of the flight of less than 24 hours

vi. The departure after an unscheduled landing.

vii. The departure of aircraft with a maximum take-off weight of up to 2000 kg

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[665] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[666] Bundesministerium für Finanzen (Federal Ministry of Finance) (no date) *Flugabgabe (Flight Charge)*, Accessed 24 January 2014, https://www.bmf.gv.at/steuern/a-z/flugabgabegesetz/flugabgabe.html

viii. The departure of state aircraft within the meaning of Article 3 of the Convention on International Civil Aviation , Federal Law Gazette No 97/ 1949.

- Revenue in 2012: €107 million (equivalent to 0.035% of GDP).[667]

A.5.3 Pollution and Resources

- Abandoned hazardous site levy:
  - Rates are charged per tonne of material deposited in a landfill and are set based on the environmental impact of the material. This tax is paid at the national level (Zollamt/customs duty office). (2013)[668] [669]:
    - Excavation and construction waste: €9.20/tonne
    - Residual materials: €20.60/tonne
    - Mechanically-biologically pre-treated waste: €29.80/tonne
    - Hazardous waste: €29.80/tonne
    - Deposition of municipal waste or other waste with high portion of biodegradable material in landfill (materials with more than 5% TOC banned from landfill since 2009): €87.00/tonne
    - Incineration of waste (collected as part of the landfill tax since 2006): €8/tonne
  - Revenue in 2012: €43 million (equivalent to 0.014% of GDP)[670]
- Land tax B:

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[667] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

[668] Bundesministerium für Finanzen (Federal Ministry of Finance) (2013) *Altlastenbeitrag (Landfill Tax)*, Accessed 31 December 2013, https://www.bmf.gv.at/zoll/fuer-unternehmen/altlastenbeitrag/altlastenbeitrag.html

[669] ECT/SCP (2013) *Municipal Waste Management in Austria*, Report for European Environment Agency, February 2013, http://www.eea.europa.eu/publications/managing-municipal-solid-waste/austria-country-paper-on-municipal, pp 12-14.

[670] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

- Rates: Standardised value < 3,650: ((standardised value x 0.16%) + 5) (per year). Standardised value > 3,650: ((standardised value x 0.2%) + 5) (per year)
- Revenue in 2012: €586 million (equivalent to 0.19% of GDP).

➢ Hunting and fishing duties:

- Rates set regionally.
- Revenue in 2012: €10 million (equivalent to 0.0033% of GDP).

➢ Vienna Tree Protection Act:

- €1090 / tree with a circumference of more than 40 cm that is cut down without replacement.
- Revenue in 2012: €1 million (equivalent to 0.0003% of GDP).

➢ Levy for landscape protection and nature conservation:

- Different measures per „Bundesland"/region, e.g.:
  - **Lower Austria:**
    - Category 1: gravel, sand, ballast
    - Category 2: limestone (not used for manufactoring of cement, lime or plaster
    - Category 3: limestone with CaCO3 > 95 % and used for manufactoring of cement, lime or plaster
    - Category 4: graphite, kaolin, clay, quartzite
    - Levy:
    - Category 1 and 2: 0,194 EUR/t
    - Category 2 and 3: 0,054 EUR/t
    - Source: Niederösterreichische Landschaftsabgabeverordnung 2012 (http://www.noe.gv.at/Land-Forstwirtschaft/Landwirtschaft/Landschaftsabgabe.html)
  - **Salzburg:**
    - Lockergesteine (gravel, sand, ballast): 0,175 EUR/t
    - Festgesteine (graphite, kaolin, clay, quartzite, limestone, marble, dolomite, gypsum mineral earth/soil: 0,175 EUR/t
    - Turf/peat: 0,3490 EUR/m³
    - Source: Landesgesetzblatt: 18. Verordnung der Salzburger Landesregierung vom 1. März 2013 zur Neufestsetzung der Höhe der

        - Naturschutzabgabe (http://service.salzburg.gv.at/publix/Index?cmd=dokumentansehen&prodextern=true&veroeffentlichungid=4339&gruppeldap=lgbl)
    - **Vorarlberg:**
        - gravel, sand, filling material: 0,7 EUR/t
        - stones: 0,35 EUR/t
        - Source: Amtsblatt für das Land Vorarlberg, Jahrgang 68 / Nr. 42 (http://www.vorarlberg.at/archiv/amtsblatt/amtsblatt_2013_42.pdf)
    - **Tyrol:**
        - Mineral resources: 0,25 EUR/m3
        - Building of ski cableways: 2 EUR/ m liftline/slope
        - Building of sports grounds: 1 EUR/m2, max 40.000 EUR
        - Snow guns/blowers: 30 EUR/ 1.000 m3 water per year
        - Water used for electricity production plant/generator: 1 EUR/ litre per second water flow
        - Source: Tiroler Naturschutzgesetz 2005, Fassung vom 18.01.2014
        - http://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrT&Gesetzesnummer=20000252
    - **Kärnten/Carinthia:**
        - extraction of mineral resources except turf/peat: 0,146 EUR/t
        - turf/peat: 0,291 EUR/t
        - Source: Kärntner Naturschutzgesetz 2002 - K-NSG 2002
        - http://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrK&Gesetzesnummer=20000118
- Revenue in 2012: €9 million (equivalent to 0.003% of GDP).

➢ Levy on dangerous waste:

- Rate: set locally, paid to municipality.
- Revenue in 2012: €1 million (equivalent to 0.0003% of GDP).

A.5.4 Water Charges

In Austria, water charges exist as a form of "ecologically relevant payment". Rates are set by municipal governments and vary greatly across federal states. Groundwater rights are related to land ownership, whereas abstraction from surface waters is strictly regulated.

Agricultural use of water is charged with a mix of a volumetric element and a flat rate based on the area used for crops. Charges include a connection fee ("Anschlussgebühr") and a user fee which depends on the amount of water used. [671] Additionally, a wastewater surcharge has been implemented in many municipalities. Such charges must be below a federal regulatory limit. On average, it is estimated that water charges cover 85% of annual costs to municipalities for providing water services. Households contribute 70-75% to cost recovery of water services, industry 20-25% and agriculture 2-5%.[672]

Revenues were €1.1 billion (equivalent to 0.36% of GDP) from wastewater charges and €422 million (equivalent to 0.14% of GDP) from water charges in 2011 (the latest year for which figures are available).[673]

[671] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Austria*, Report for European Commission - DG Environment, July 2013, page 8.

[672] OECD (2013) *OECD Environmental Performance Reviews: Austria 2013*, 2013, page 90.

[673] Statistik Austria (2013) *Österreichs Steuereinnahmen Berechnet nach dem Europäischen System der Volkswirtschaftlichen Gesamtrechnungen (ESVG '95) (Austria's Tax Revenue Calculated According to the European System of National and Regional Accounts (ESA '95))*, Accessed 23 January 2014, http://www.statistik.at/web_de/statistiken/oeffentliche_finanzen_und_steuern/oeffentliche_finanzen/steuereinnahmen/index.html

A.5.5 Change in Tax Bases

Table 150: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	7,163	7,016	-148
Petrol	million litres	1,902	1,902	0
Kerosene	million litres	755	755	0
LPG	thousand tonnes	118	110	-8
Heavy Fuel Oil	thousand tonnes	347	343	-4
Natural Gas	TJ (GCV)	175,659	174,434	-1,225
Coal	thousand tonnes	443	427	-16
Electricity	GWh	52,921	52,921	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[674] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[674] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 25: Change in Internal Passenger Flights, flights per year

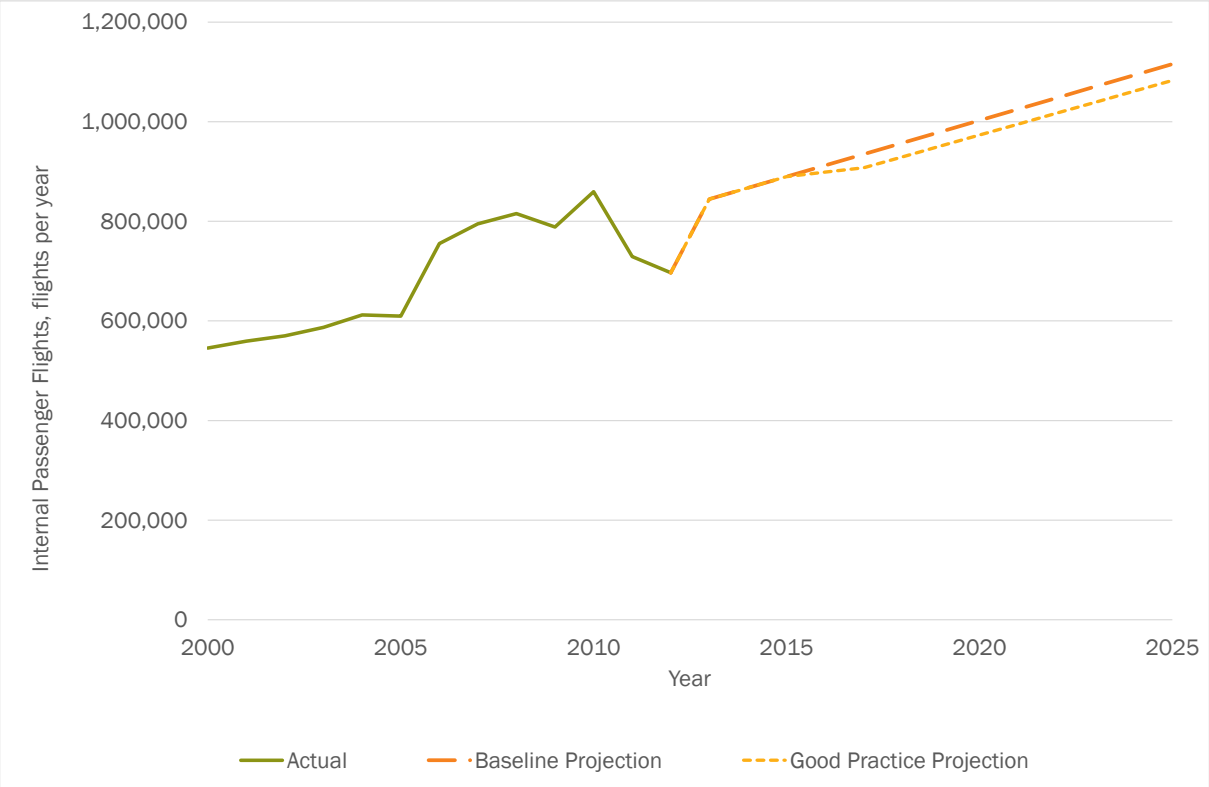


Figure 26: Change in Intra-EU Passenger Flights, flights per year

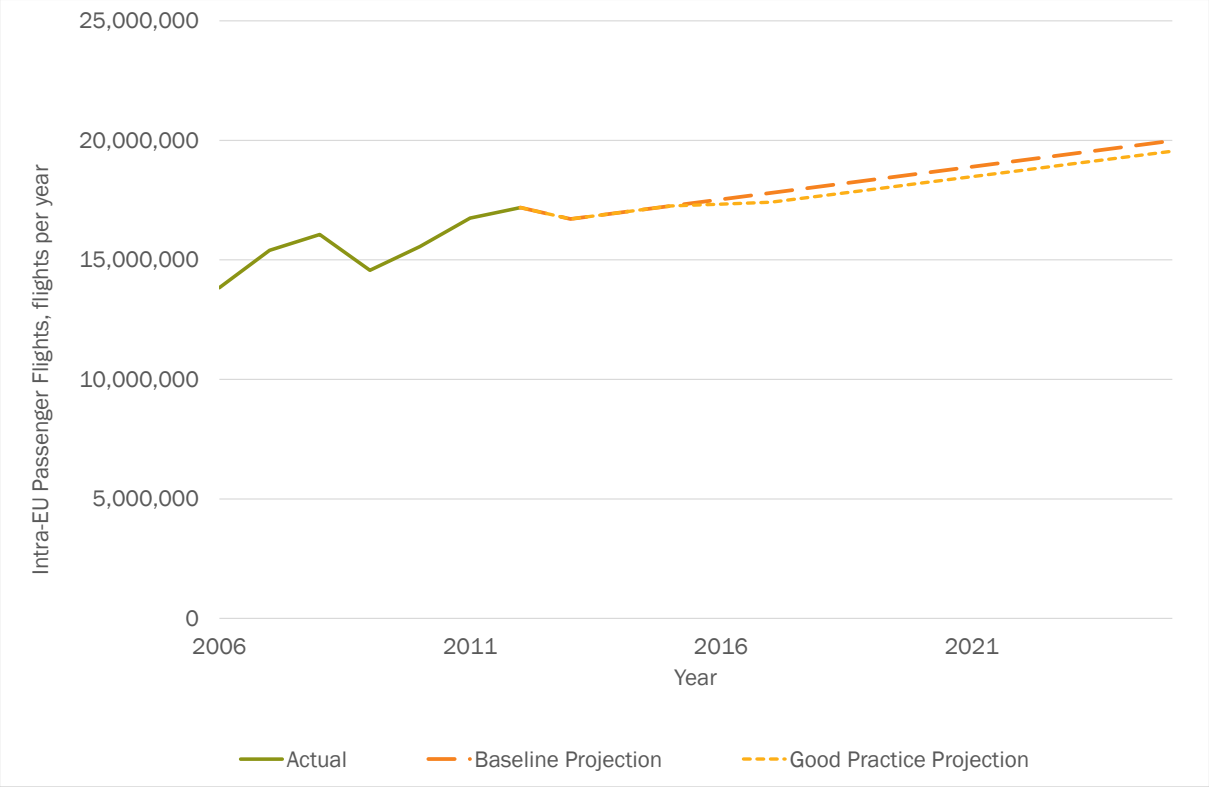


Figure 27: Change in Extra-EU Passenger Flights, flights per year

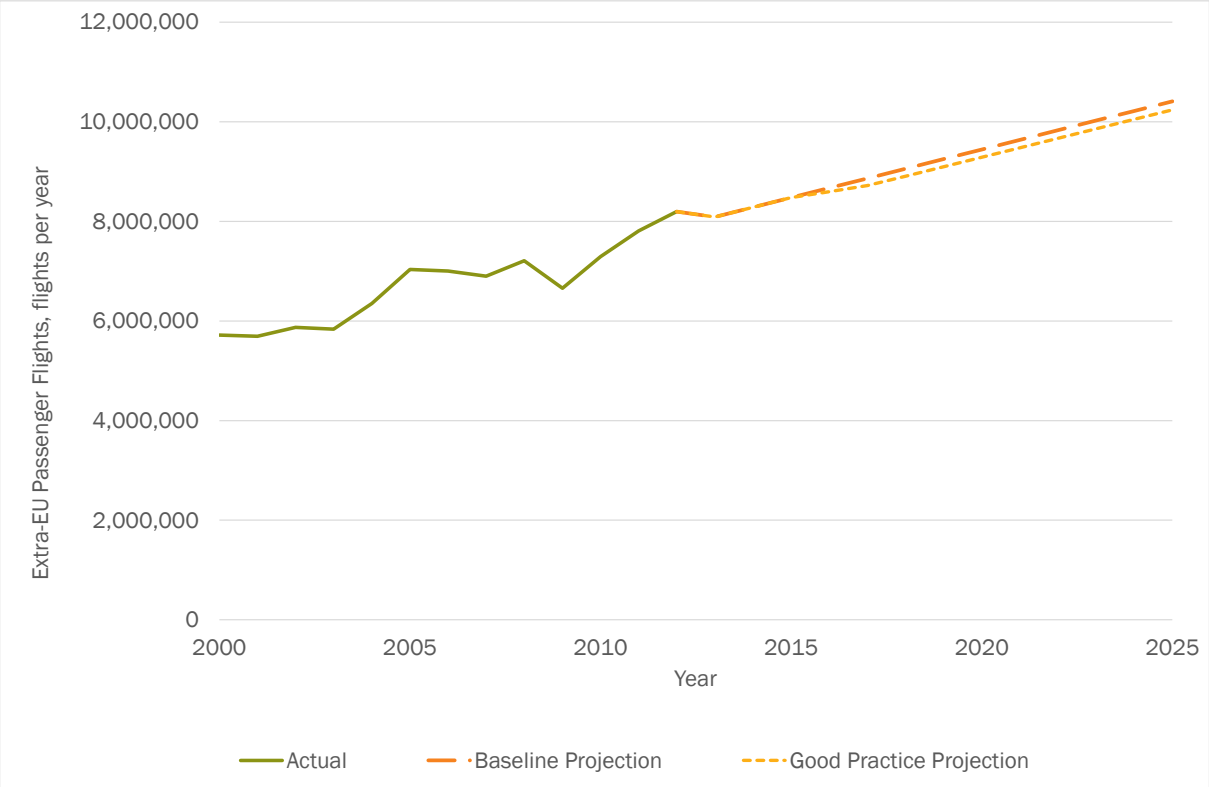


Figure 28: Change in Internal Air-freight, tonnes

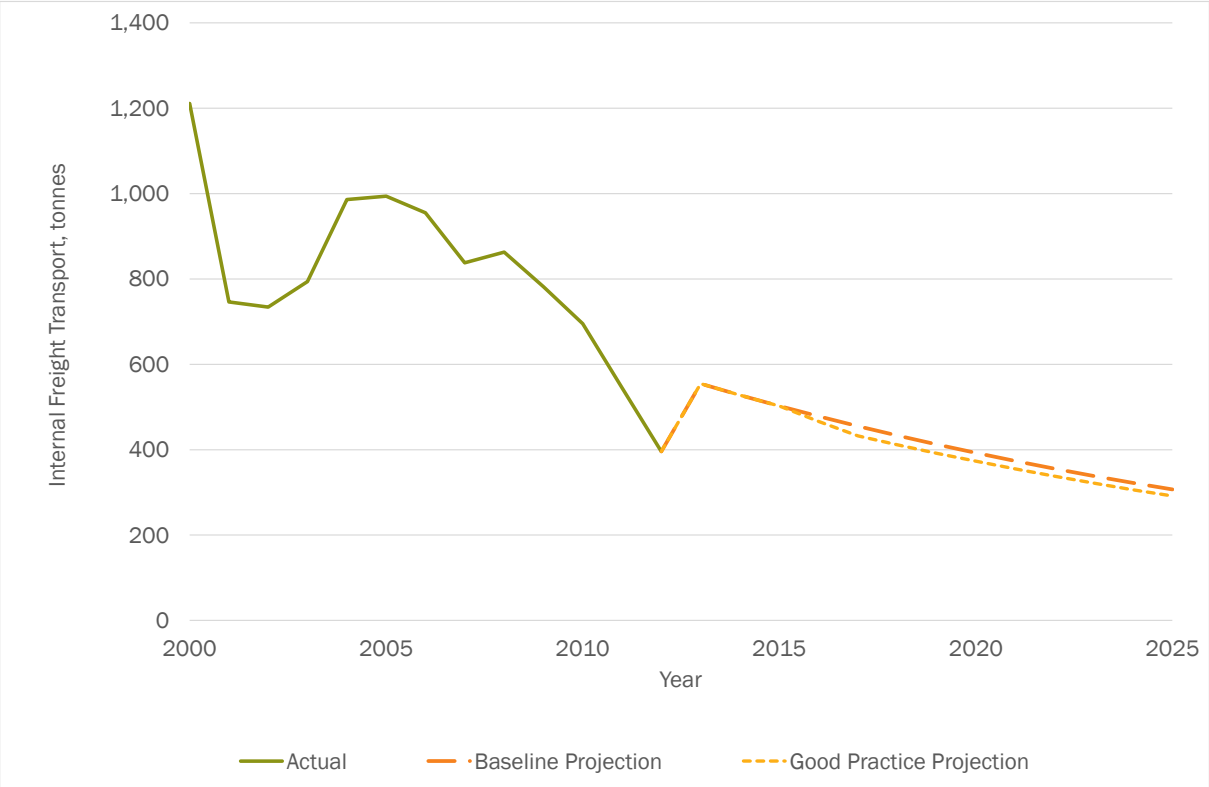


Figure 29: Change in Intra-EU Air-freight, tonnes

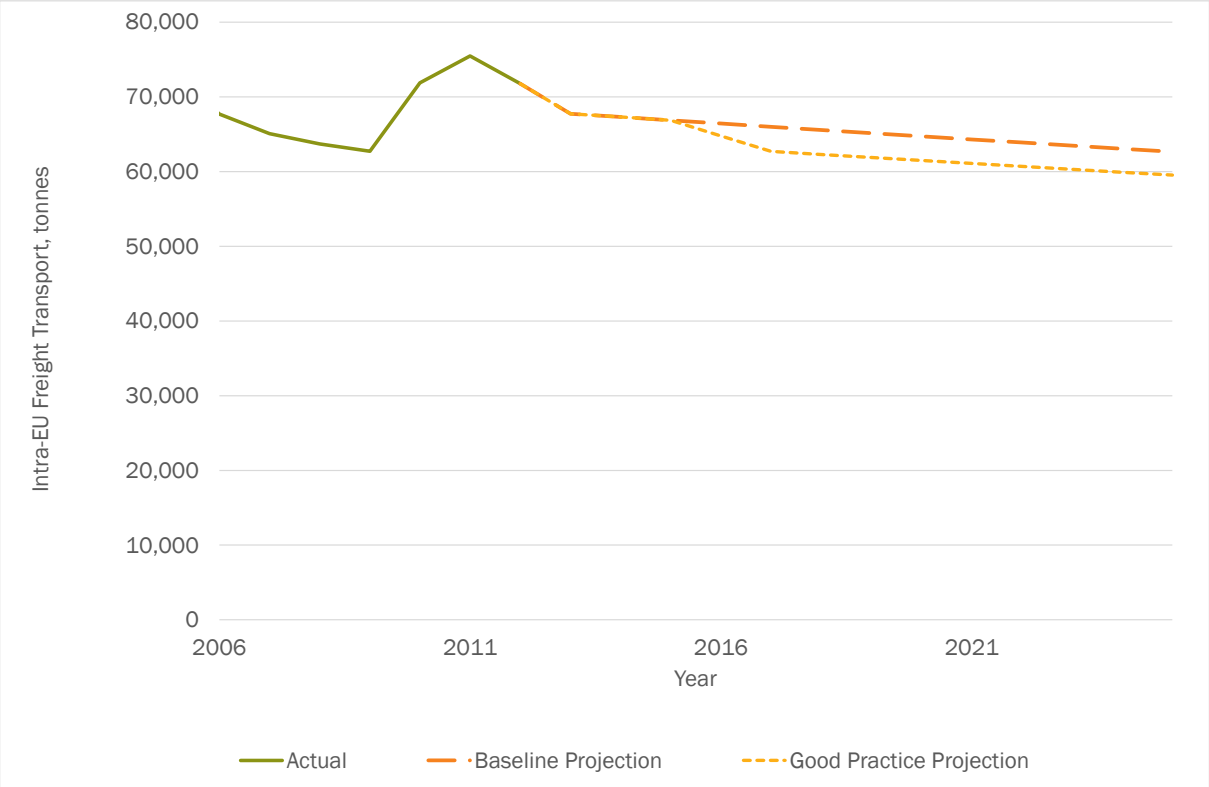


Figure 30: Change in Extra-EU Air-freight, tonnes

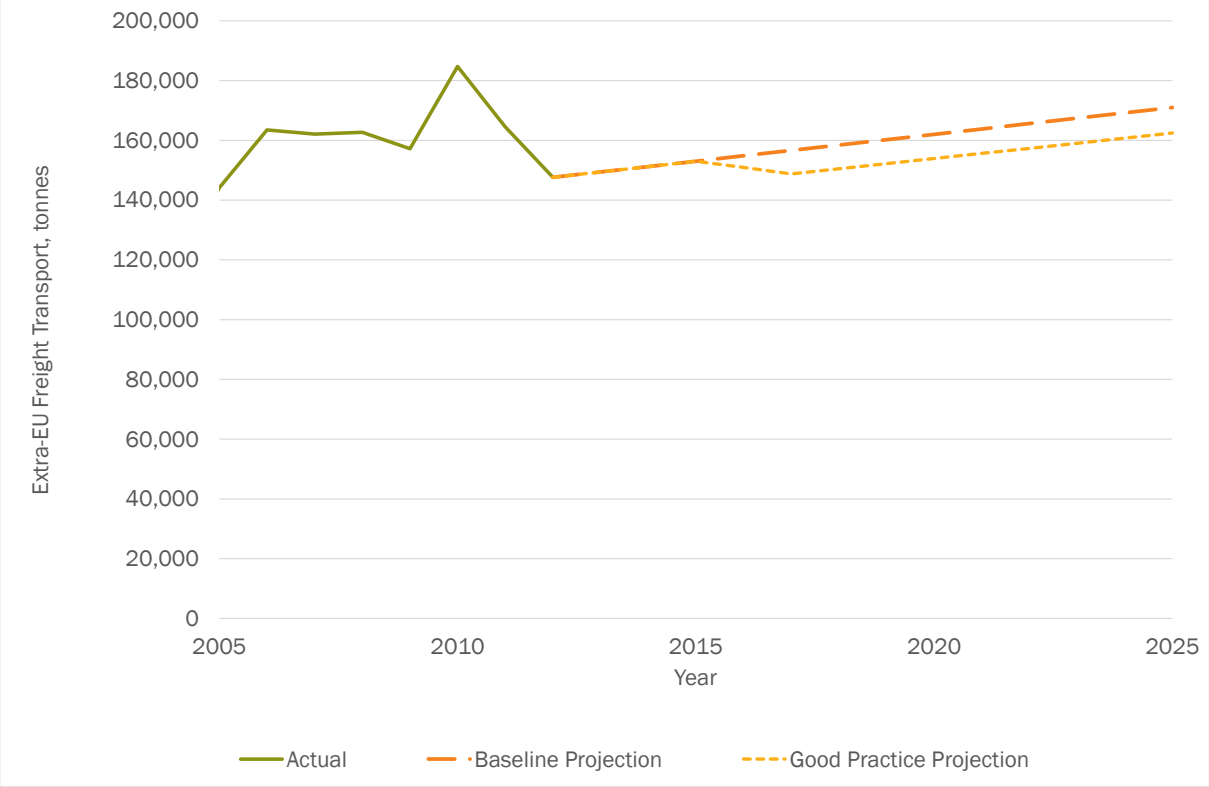


Figure 31: Change in MBT/ Incineration, thousand tonnes

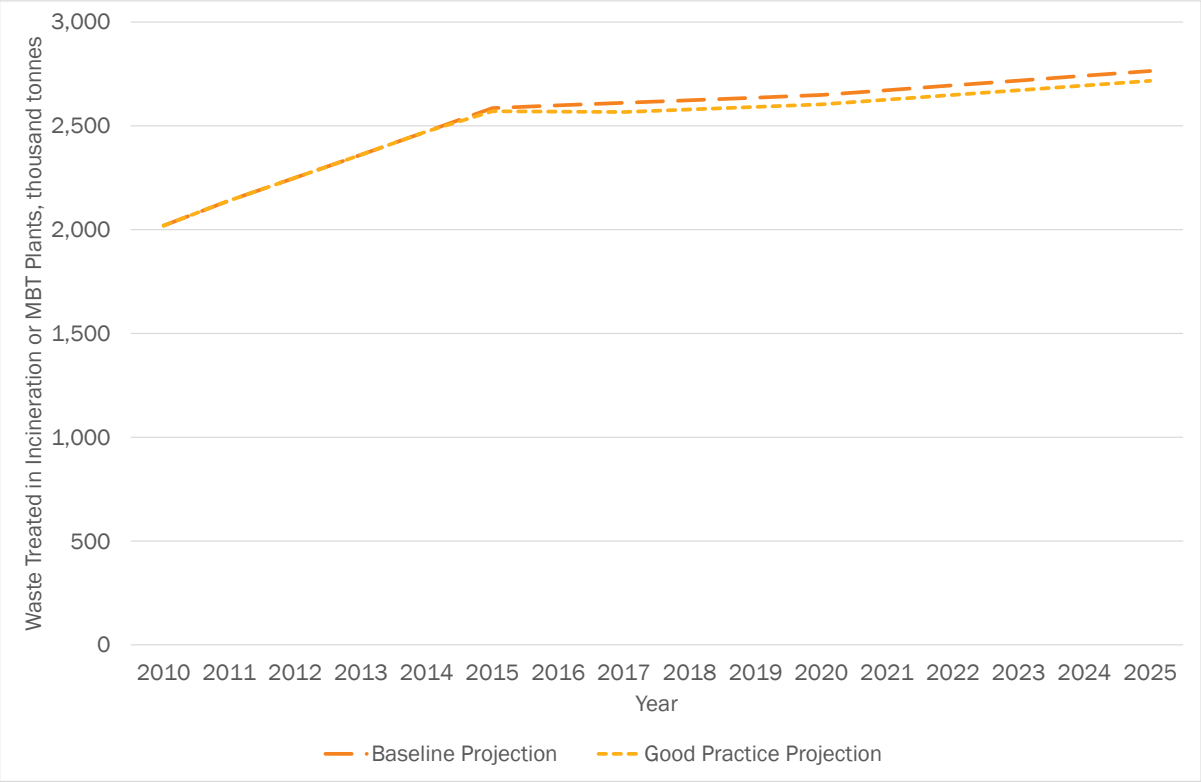


Figure 32: Change in SOx Emissions, tonnes

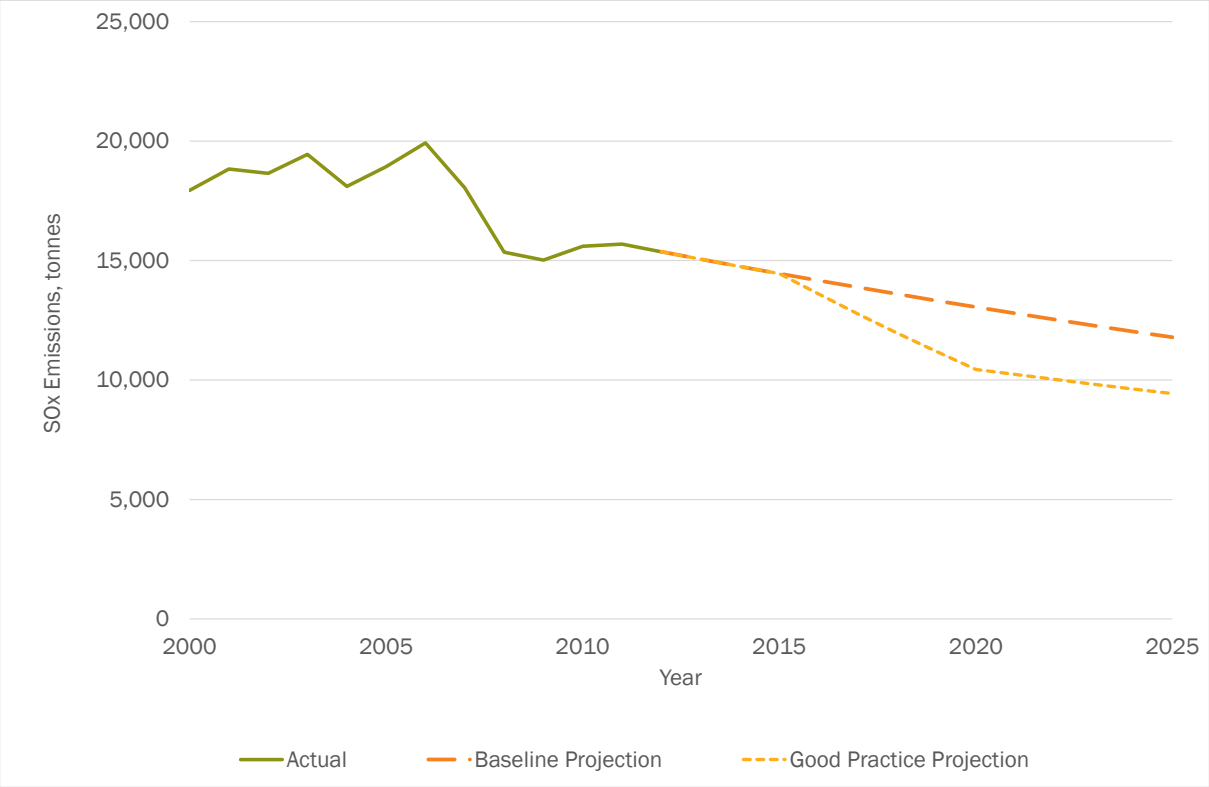


Figure 33: Change in NOx Emissions, tonnes

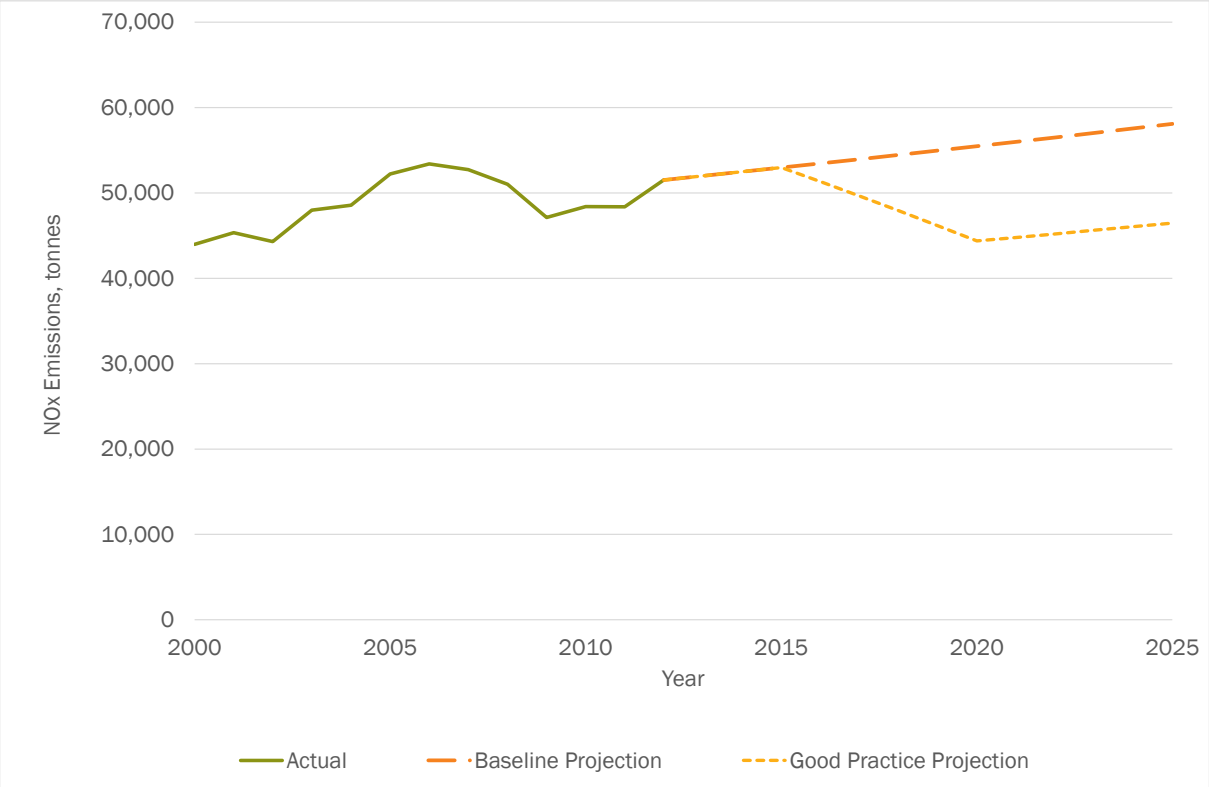


Figure 34: Change in PM_{10} Emissions, tonnes

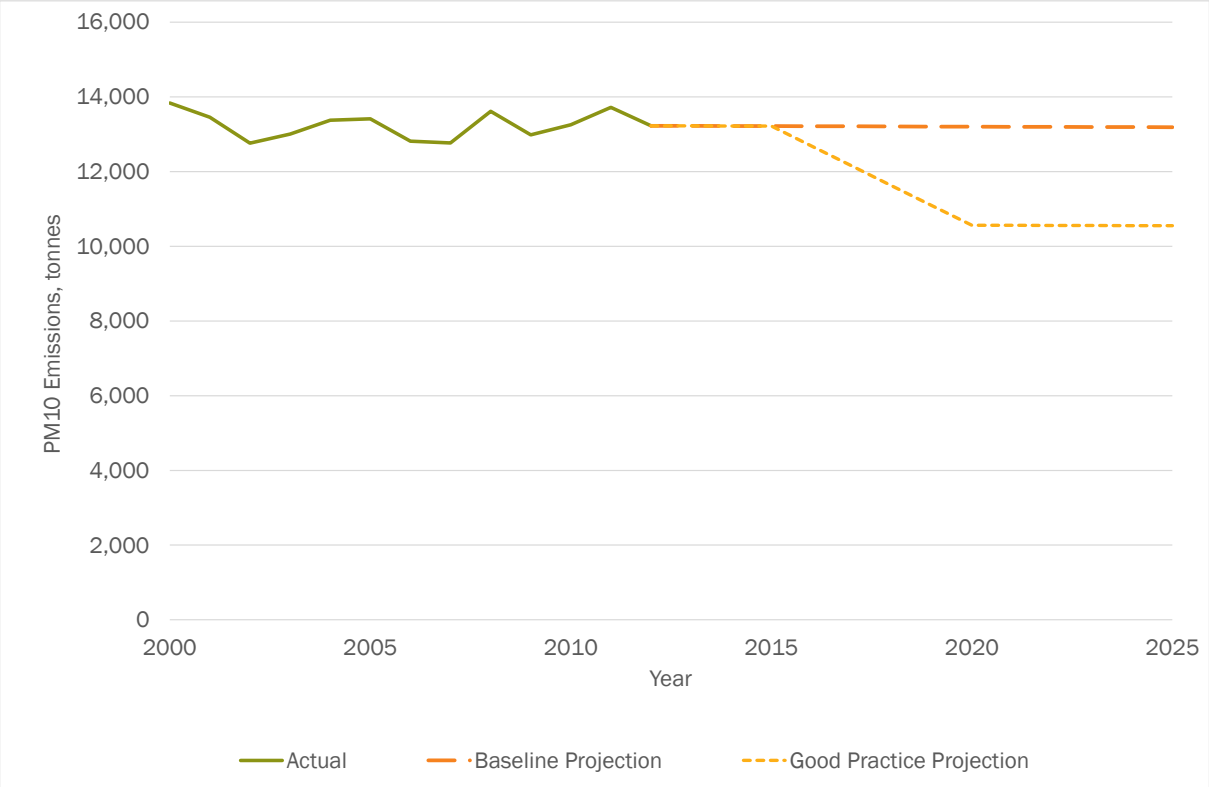


Figure 35: Change in Groundwater Abstraction – Public Supply, million cubic metres

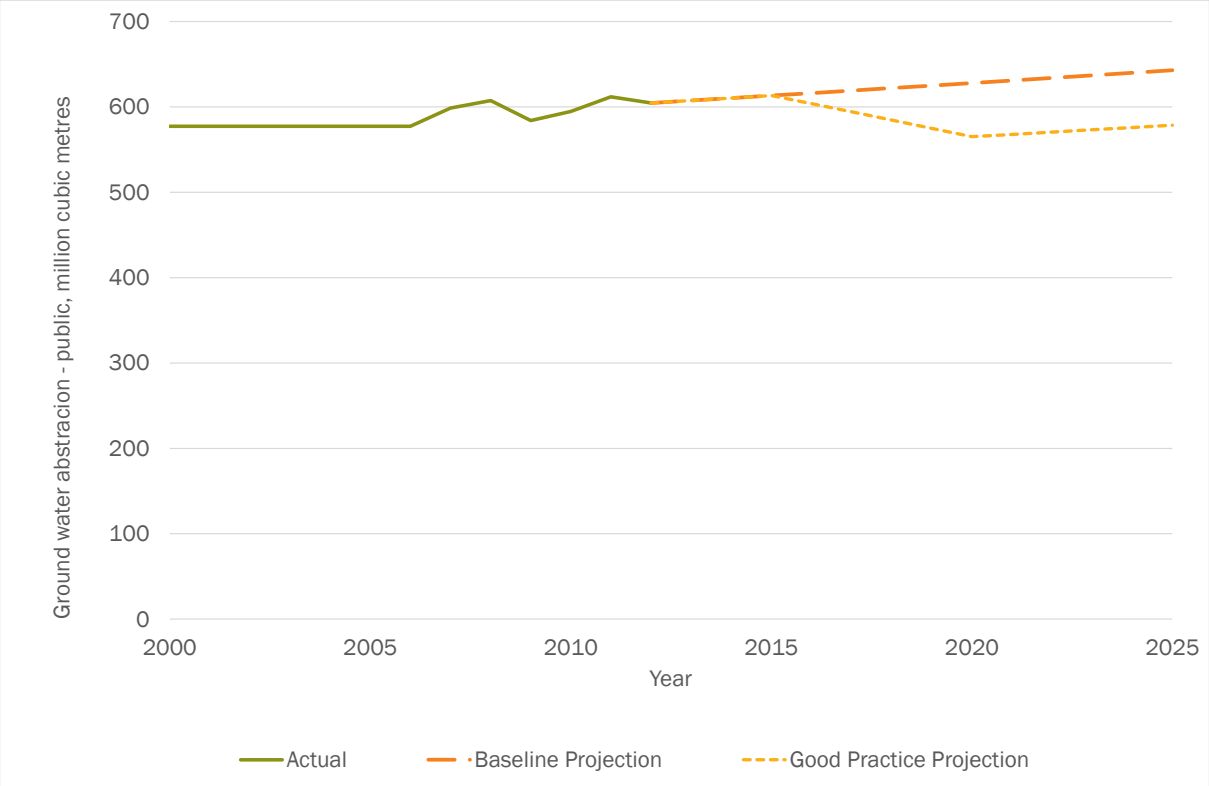


Figure 36: Change in Groundwater Abstraction – Manufacturing, million cubic metres

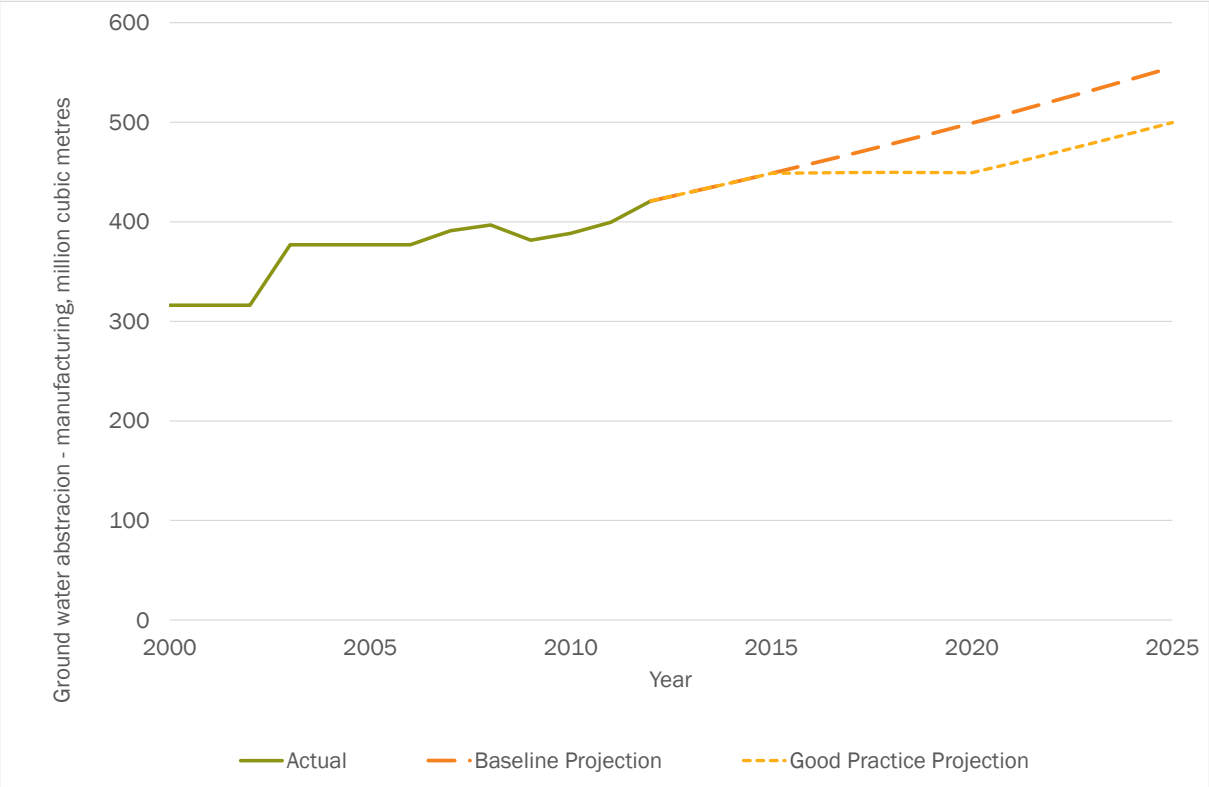


Figure 37: Change in Groundwater Abstraction – Agriculture, million cubic metres

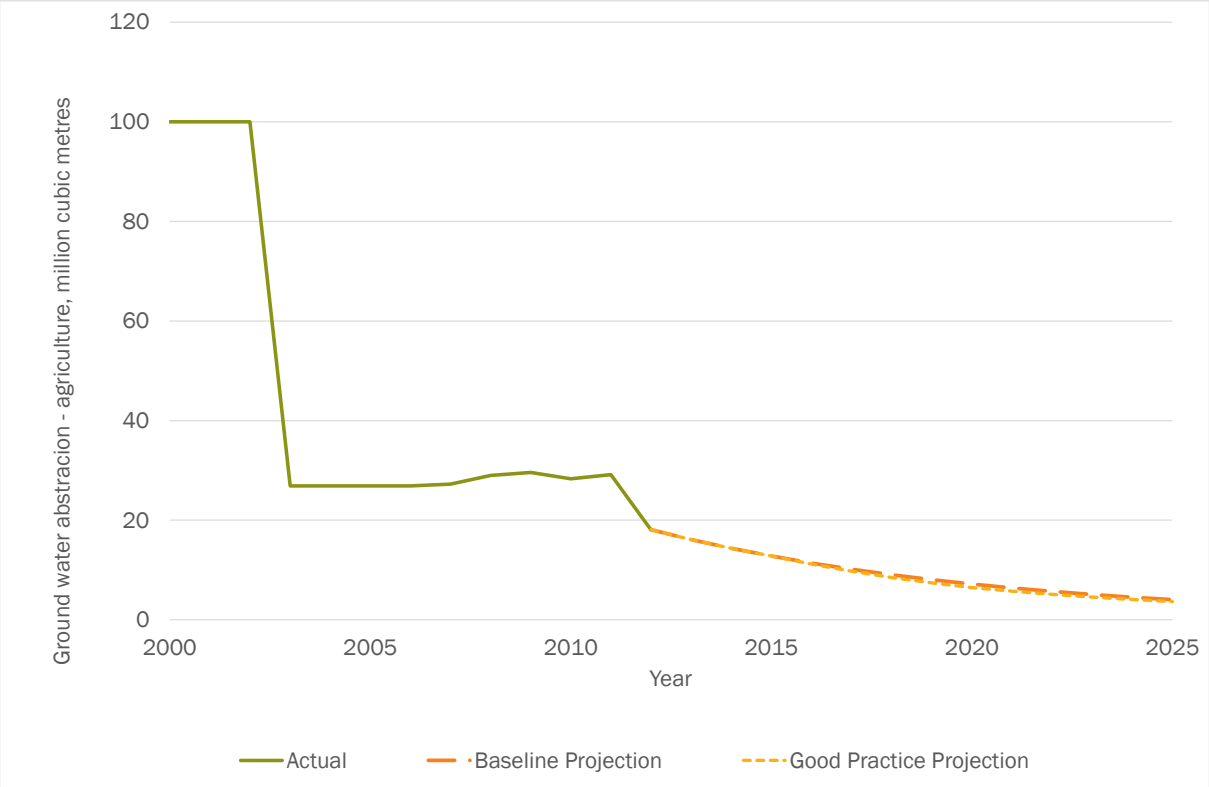


Figure 38: Change in Surface Water Abstraction – Public Supply, million cubic metres

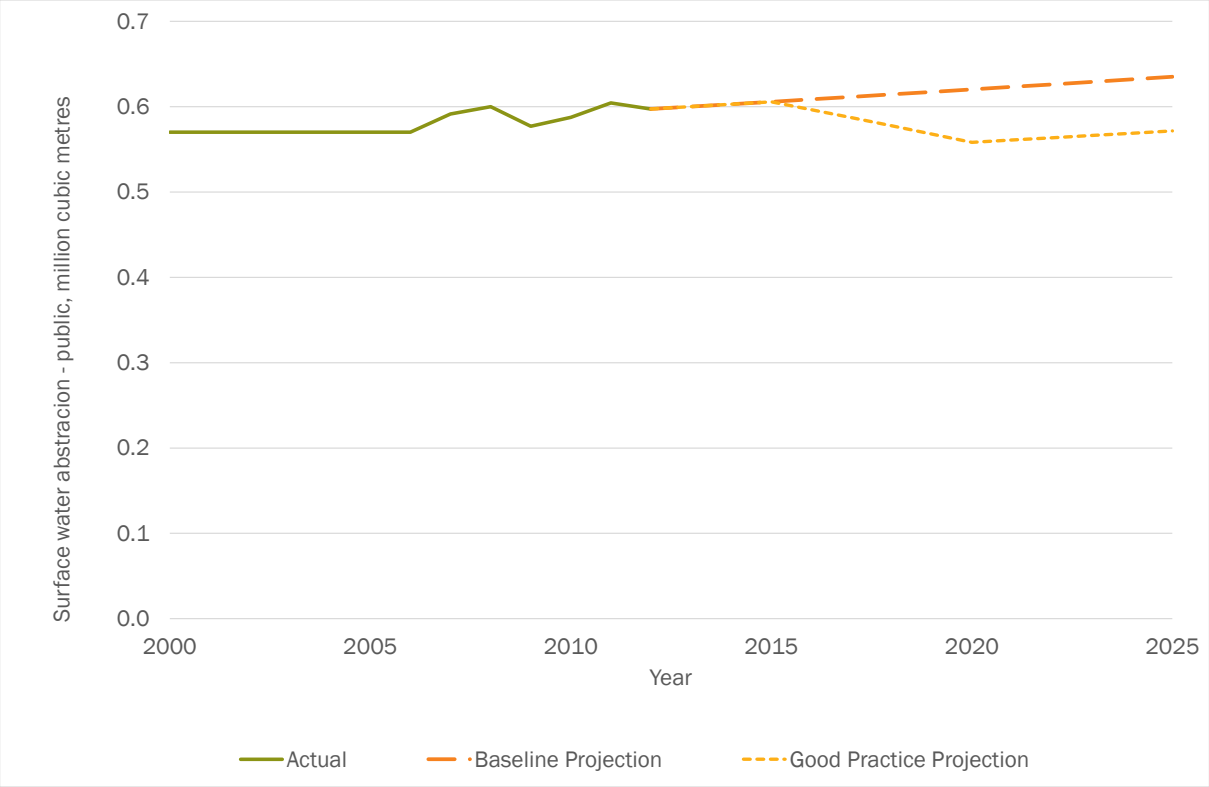


Figure 39: Change in Surface Water Abstraction – Manufacturing, million cubic metres

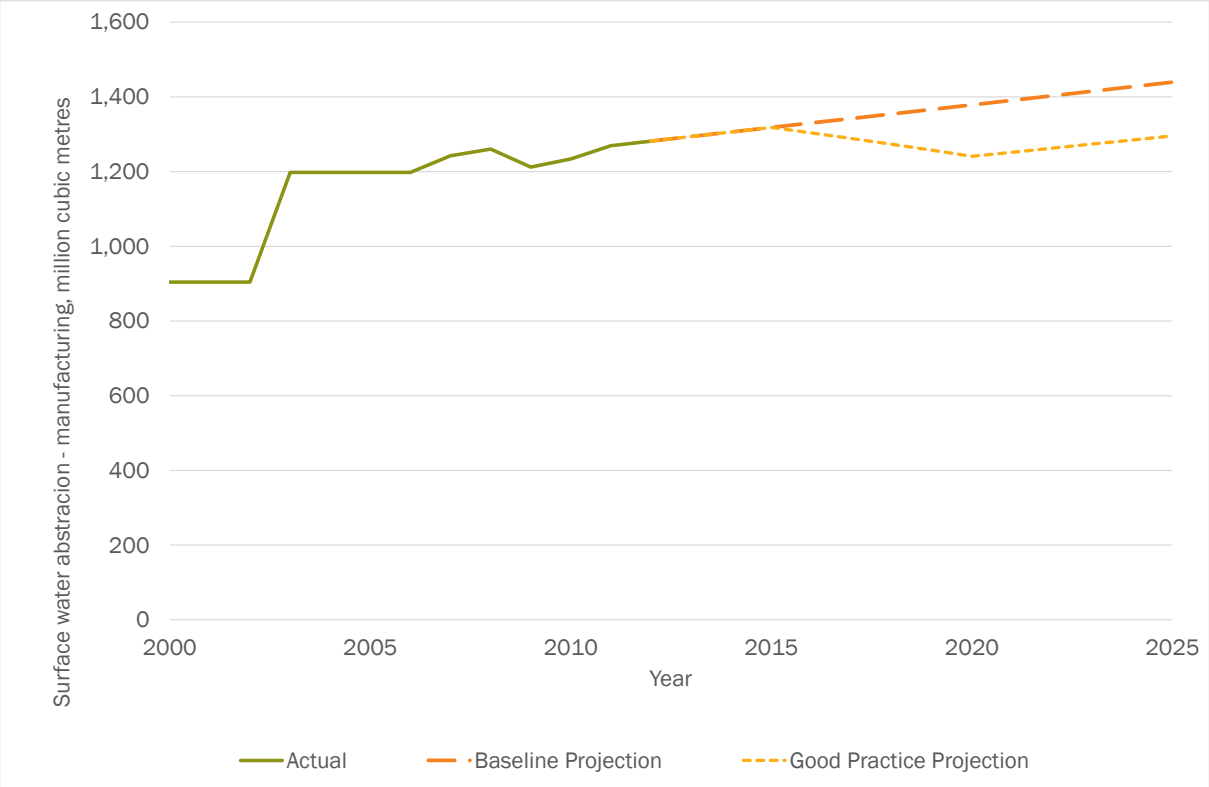


Figure 40: Change in Surface Water Abstraction – Agriculture, million cubic metres

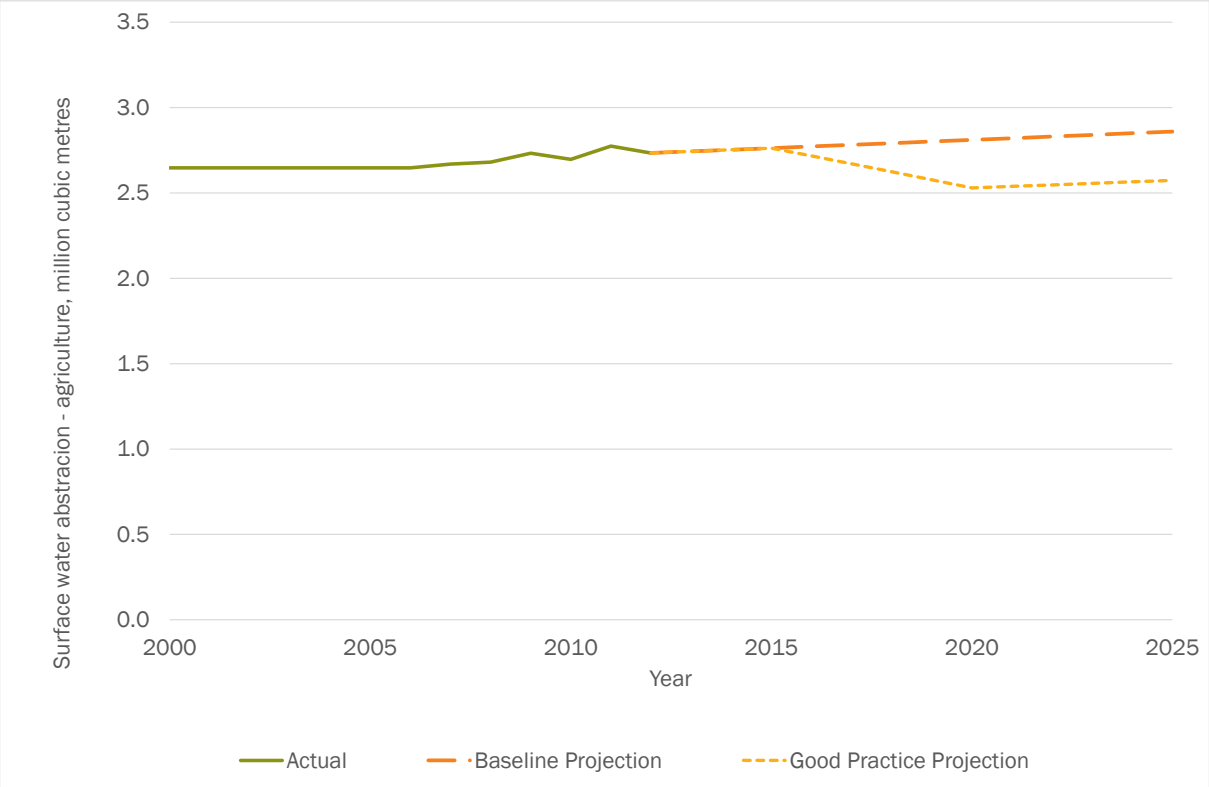


Figure 41: Change in Active Ingredients in Pesticides, tonnes

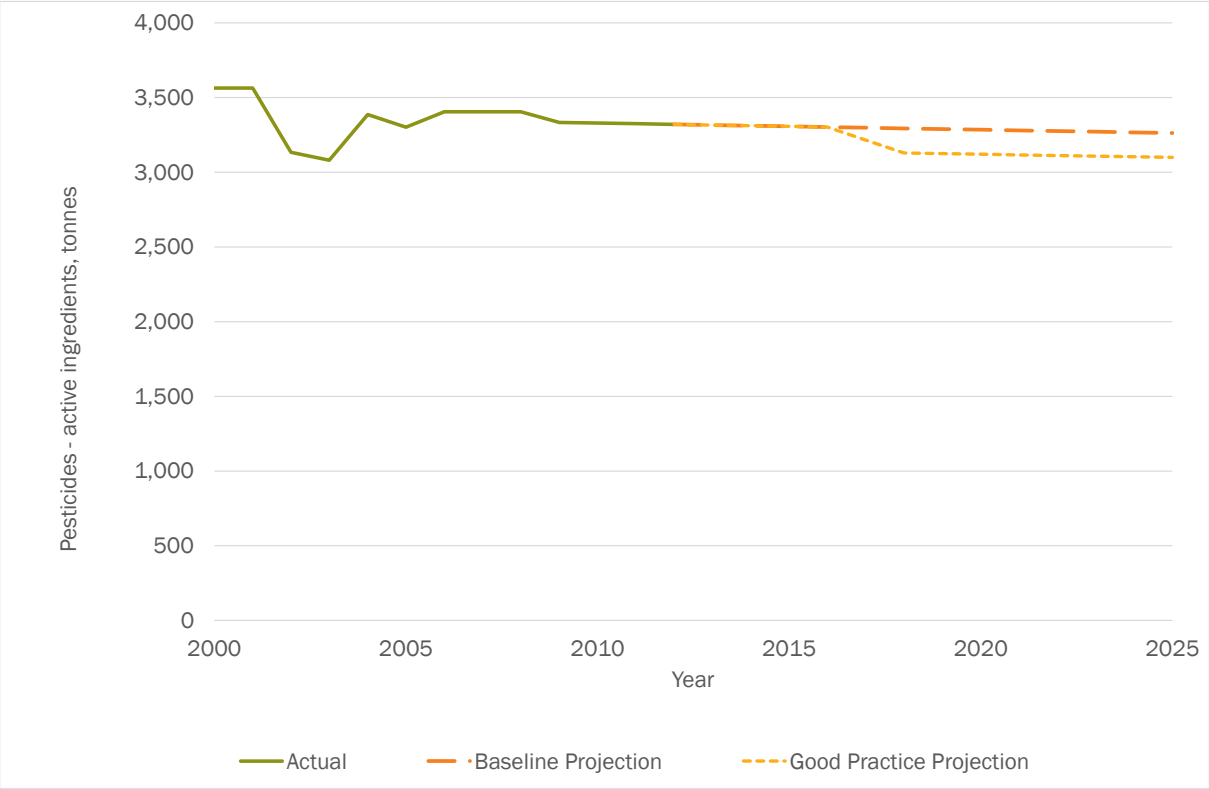


Figure 42: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

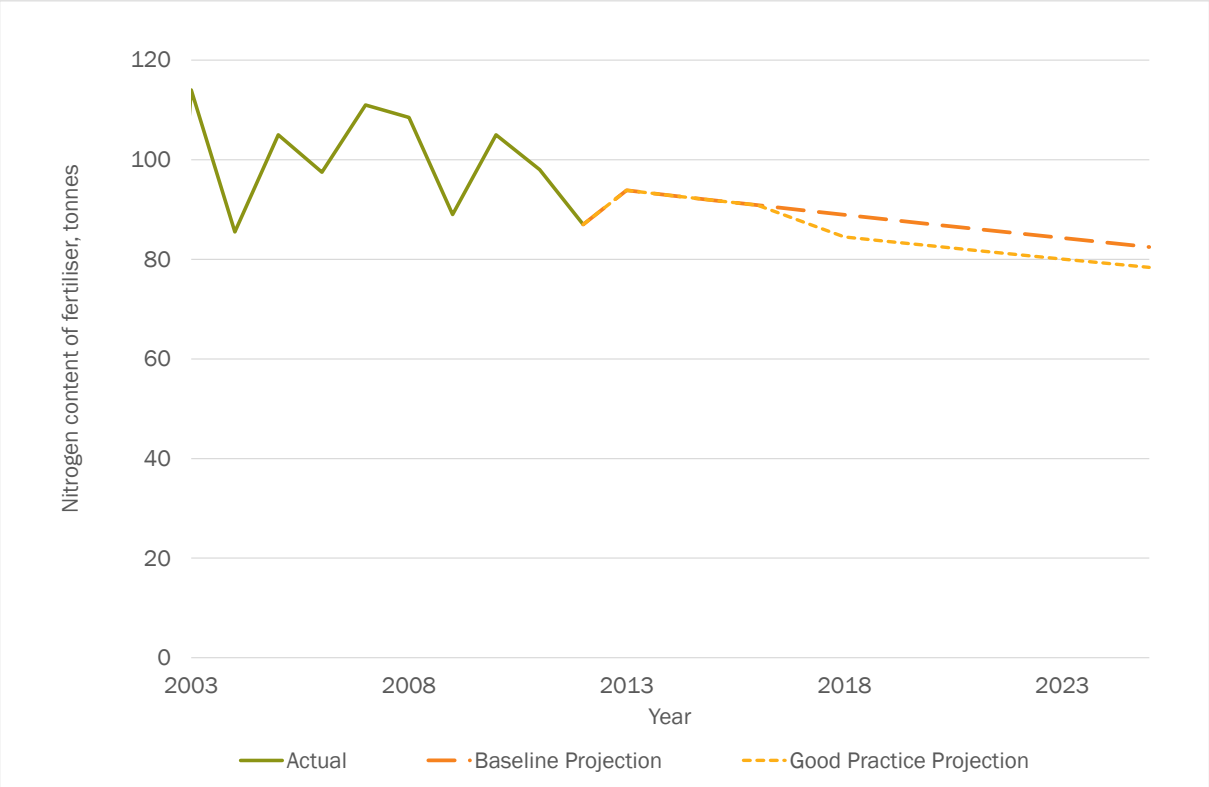


Figure 43: Change in Aggregates Extraction, thousand tonnes

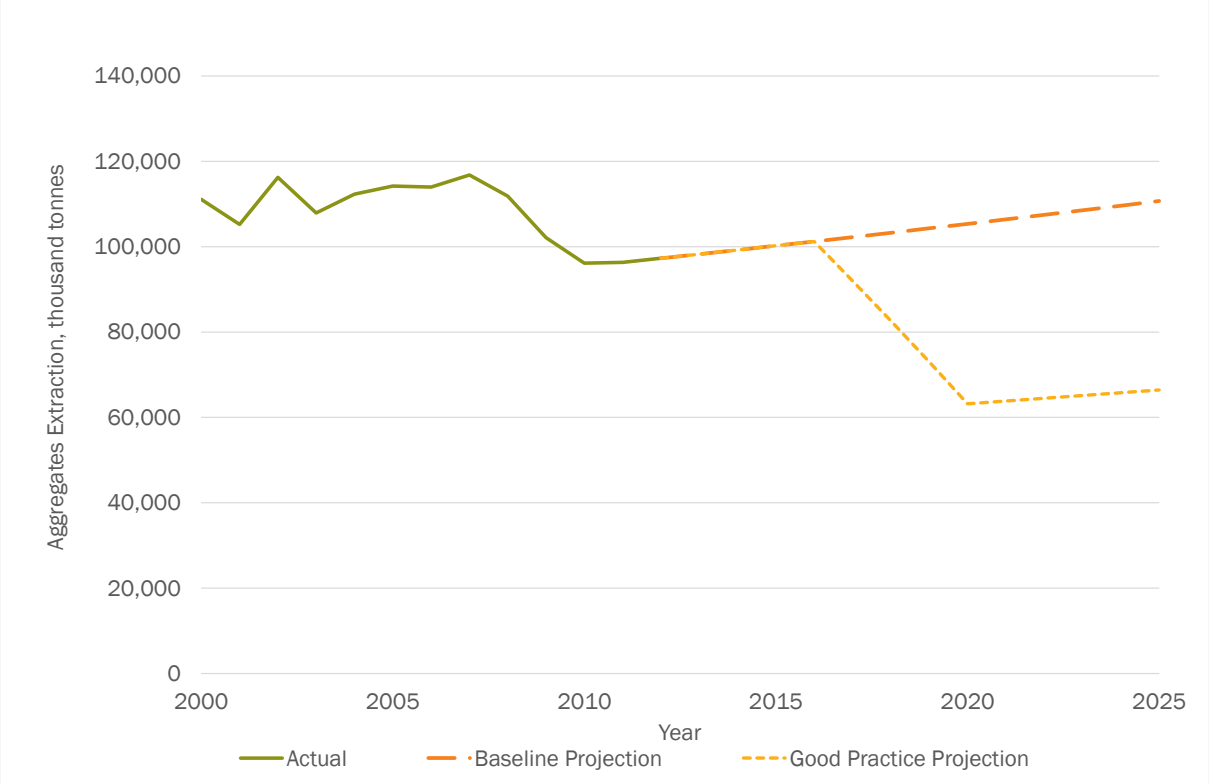


Figure 44: Change in Paper & Card Packaging Generation, thousand tonnes

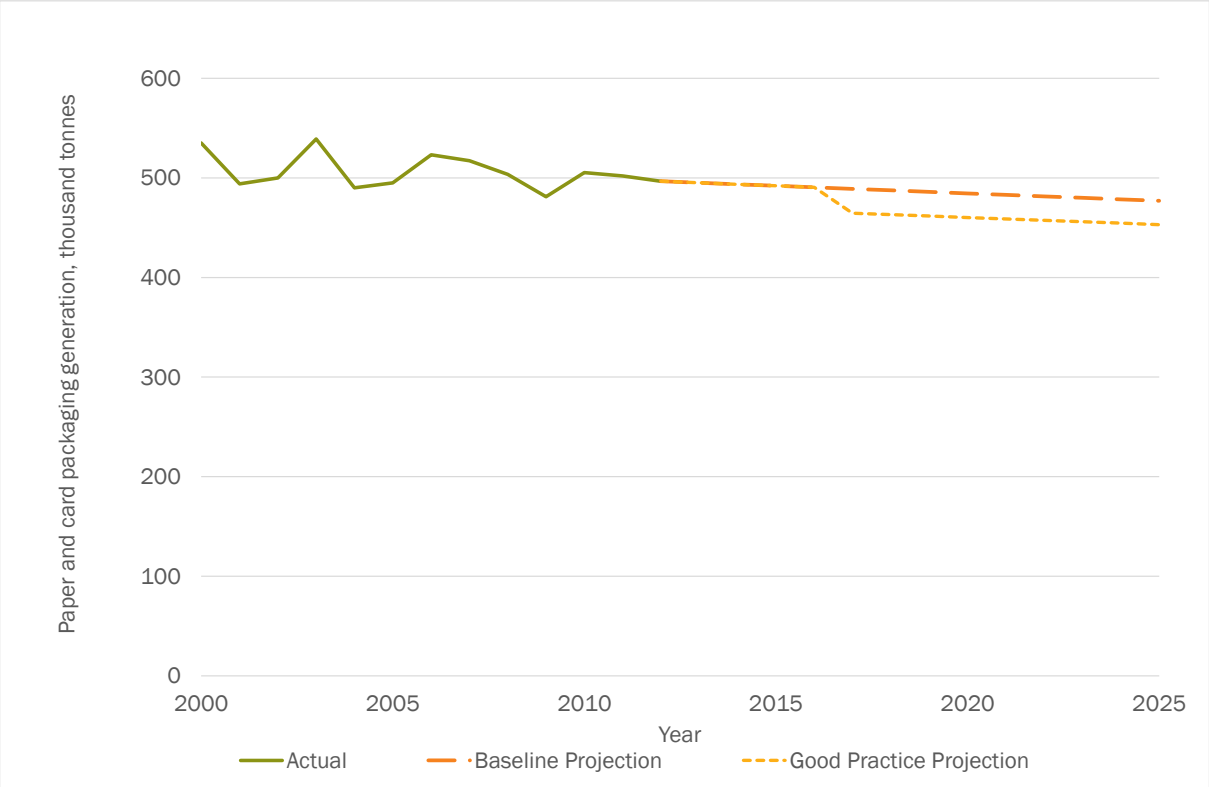


Figure 45: Change in Plastic Packaging Generation, thousand tonnes

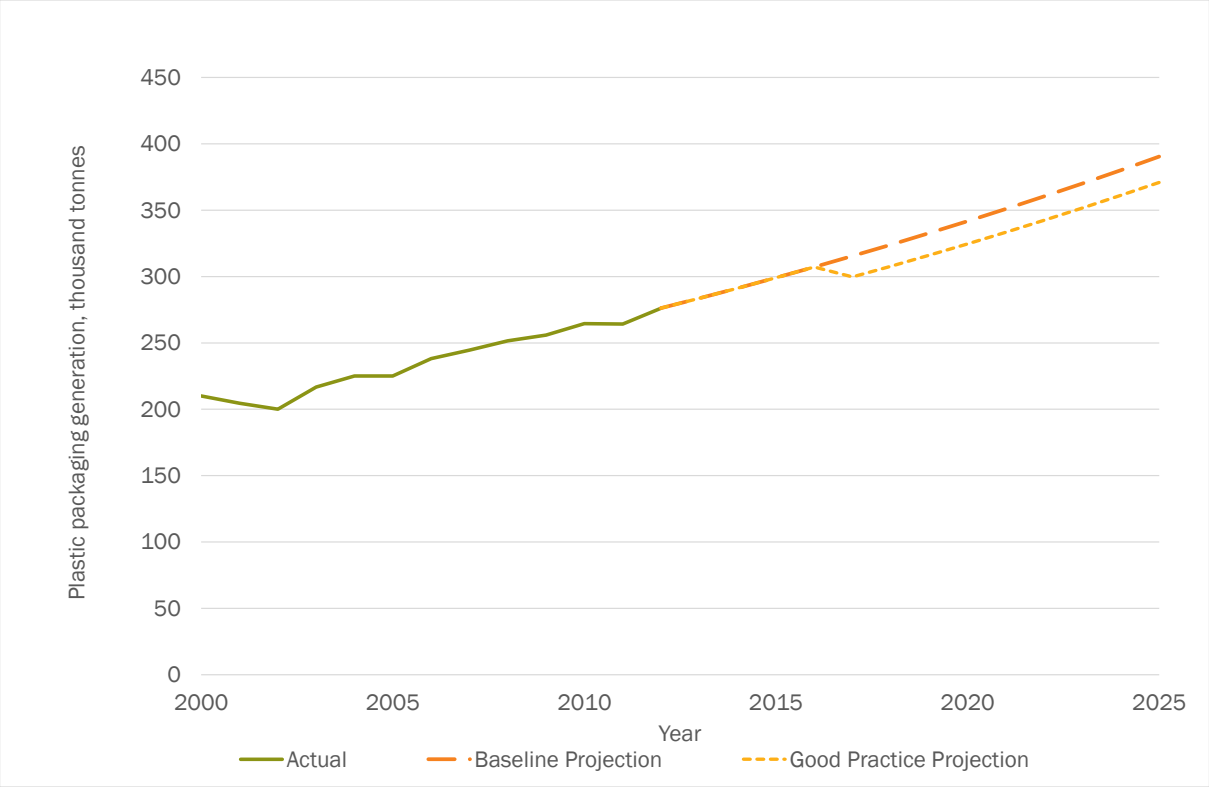


Figure 46: Change in Wood Packaging Generation, thousand tonnes

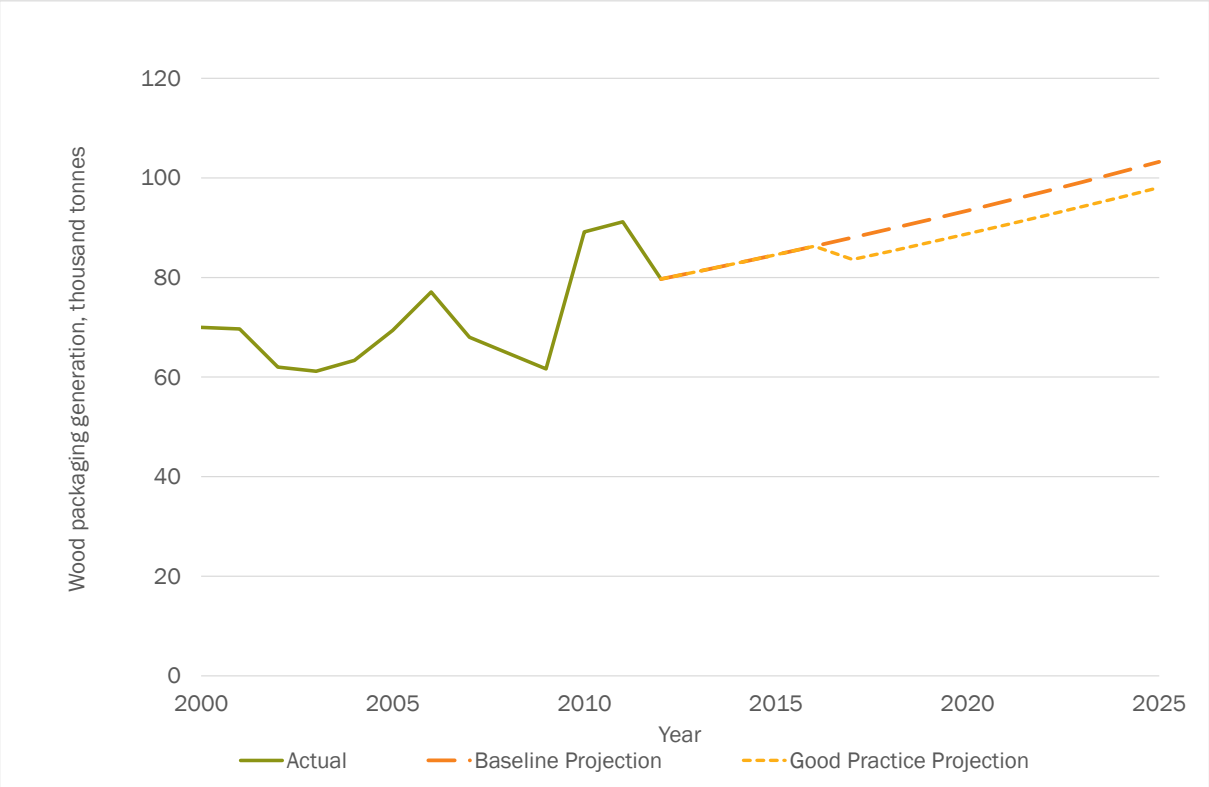


Figure 47: Change in Metal Packaging Generation, thousand tonnes

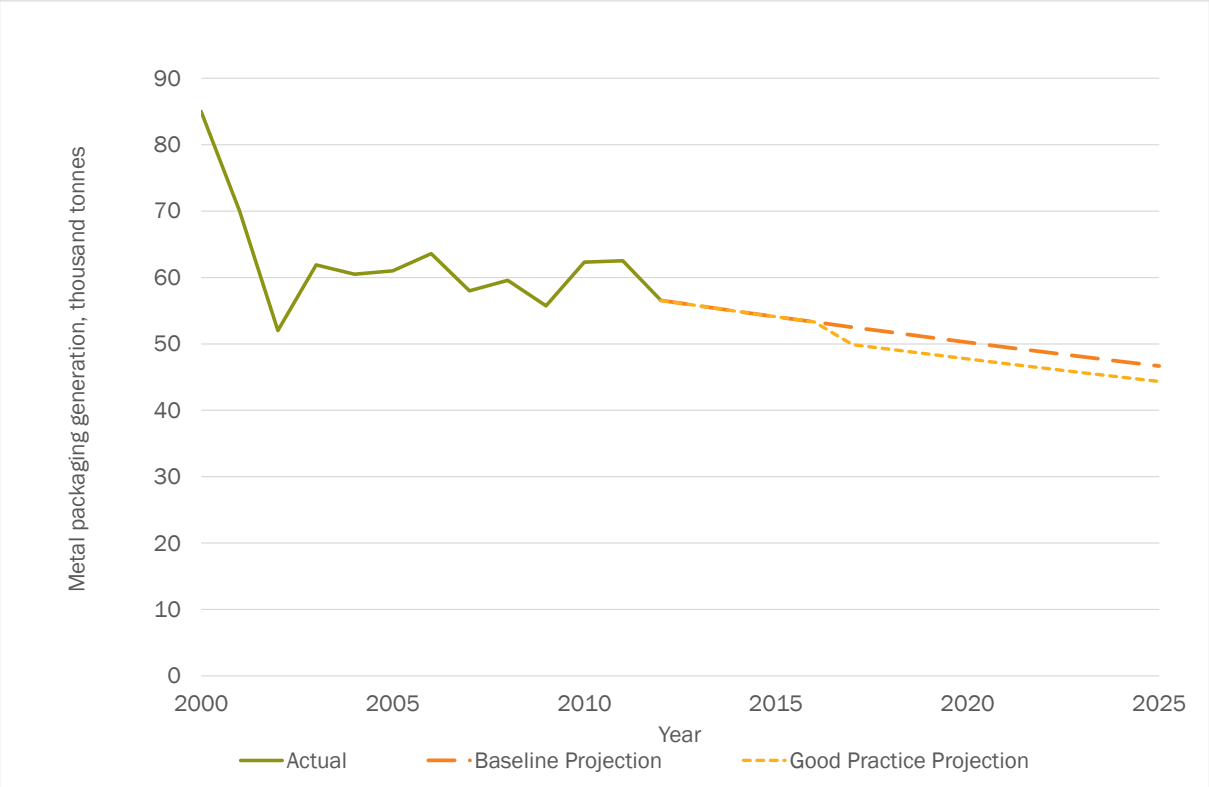


Figure 48: Change in Glass Packaging Generation, thousand tonnes

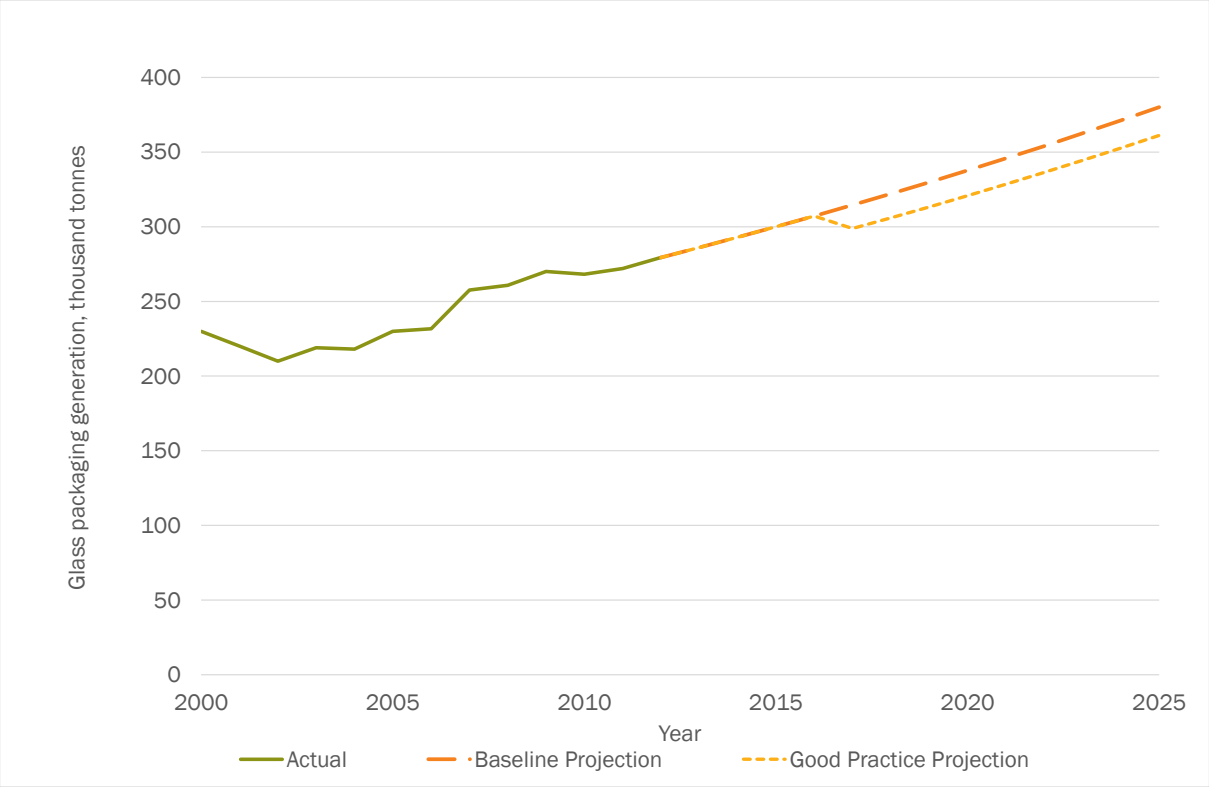
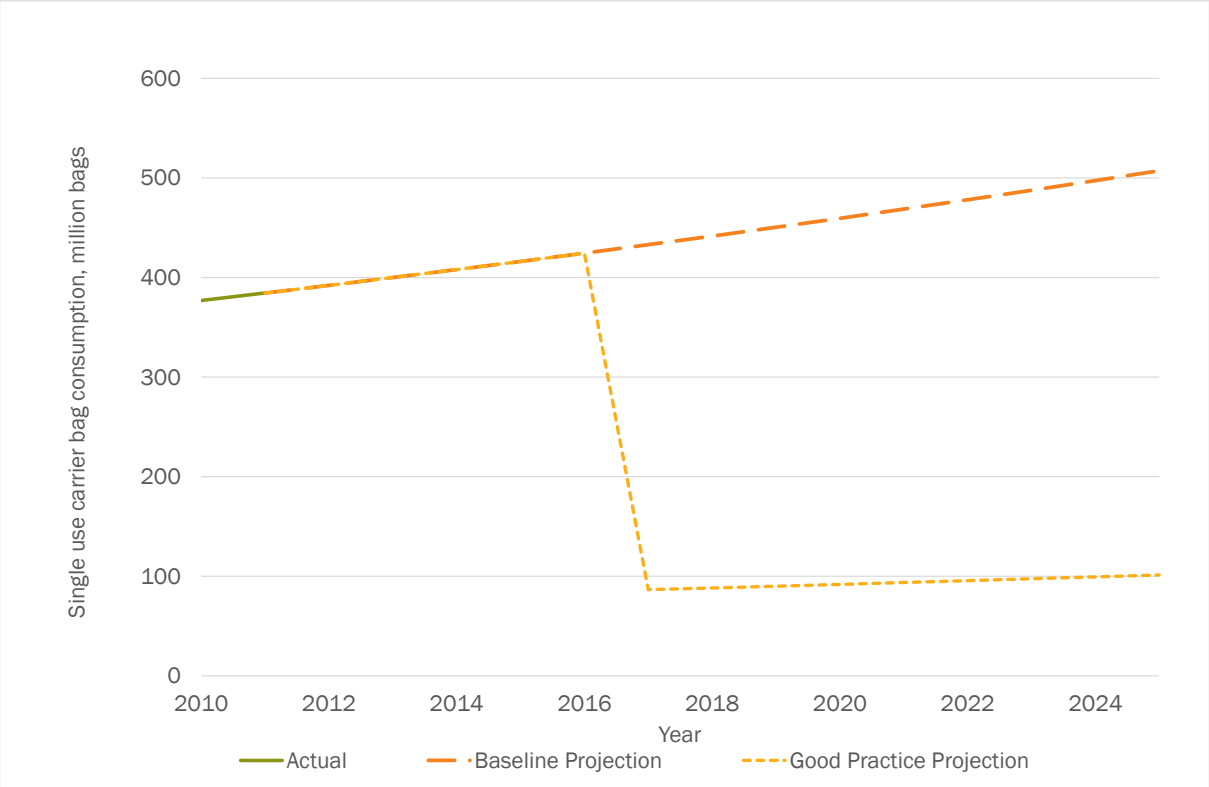


Figure 49: Change in Consumption of Single Use Carrier Bags, million bags



A.5.6 Full Revenue Outputs

Table 151: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	106	211	315	417	519	620	721	820	820	820
	C&I / Heating	0	0	2	5	7	9	12	14	16	18	18	18
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million EUR	*0*	*0*	*108*	*215*	*322*	*427*	*531*	*634*	*737*	*839*	*839*	*839*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.0%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	274	554	838	1,128	1,474	1,500	1,527	1,555	1,583	1,611
	Passenger Aviation Tax	0	0	371	739	752	766	780	794	807	821	835	849
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Transport, million EUR	*0*	*0*	*646*	*1,293*	*1,591*	*1,894*	*2,254*	*2,294*	*2,335*	*2,376*	*2,418*	*2,460*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.4%*	*0.5%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0	0

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	6	12	18	18	18	18	18	18	18	18	19
	Air Pollution Tax	0	19	36	52	67	80	76	76	76	77	77	77
	Water Abstraction Tax	0	50	99	147	194	240	237	239	242	244	246	249
	Waste Water Tax	0	14	27	39	38	38	38	38	38	38	38	38
	Pesticides Tax	0	0	17	32	31	31	31	31	31	31	31	31
	Aggregates Tax	0	0	234	211	189	166	142	143	145	146	148	149
	Packaging Tax	0	0	41	39	40	40	41	42	42	43	44	44
	Single Use Bag Tax	0	46	47	10	10	10	10	10	11	11	11	11
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	*0*	*135*	*512*	*549*	*586*	*622*	*593*	*598*	*603*	*608*	*613*	*618*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*
	Total, million EUR	0	135	1,266	2,057	2,498	2,943	3,378	3,526	3,674	3,823	3,869	3,917

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.0%	0.4%	0.6%	0.7%	0.8%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%

A.6.0 Belgium: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

A.6.1 Energy

- Excise taxes on energy in Belgium include three subcategories: 1. standard excise duties; 2. the so-called 'specific' excise tax and; 3. a federal energy contribution.[675] A full breakdown of tax rates and revenues are presented in Table 152. Further to this information, a variety of exemptions apply for a number of business sectors. The specific excise duties are as follows:
    - An excise duty on the following mineral oils: petrol, gas oil, kerosene, heavy fuel oil and liquid petroleum gas (LPG).
    - An excise duty on electricity supplied to businesses.
    - An excise duty on natural gas and other gases. Natural gas used as motor fuel is exempt from excise duties.
    - An excise duty on coal, coke and lignite. An exemption exists for use by households.[676]

[675] Department of the Federal Public Service Finance (2013) *Tax Survey Nr.25 (Update)*, October 2013, http://docufin.fgov.be/intersalgen/thema/publicaties/memento/pdf/TS2013_V10_entire.pdf

[676] Belgian Federal Public Service Finance (2013) *T5 Tax Survey, Nr. 25 (update) 2013*, October 2013, http://docufin.fgov.be/intersalgen/thema/publicaties/memento/pdf/TS2013_V10_entire.pdf

Table 152: Excise Duty Rates (1st October 2013)

Tax Type	Tax Object	Additional Details	Unit	Tax Rate (€)	Tax Revenue 2012	
					(€ million)[1]	GDP Equivalent[2]
Excise Duty on Mineral Oils	Petrol – Leaded		per 1000 litres	637.6701	1.91	0.001%
	Petrol - Unleaded	<98 octane	per 1000 litres	613.5701	936.58	0.25%
		>= 98 octane low sulphur	per 1000 litres	613.5701		
		>=98 octane high sulphur	per 1000 litres	628.5701		
		Petrol with min 7% biofuel[3]	per 1000 litres	570.6202		
	Gas Oil - Propellant use	>10mg/kg sulphur content	per 1000 litres	442.6880	3,351.33	0.89%
		<=10mg/kg sulphur content	per 1000 litres	427.6880		
		<=10mg/kg sulphur content with min 5% vol FAME	per 1000 litres	406.3036		
	Gas Oil - Industrial/Commercial use	>10mg/kg sulphur content	per 1000 litres	22.6800		
		<=10mg/kg sulphur content	per 1000 litres	22.6800		
		Energy intensive business[4]	per 1000 litres	0		
		Non-energy intensive business[5]	per 1000 litres	11.3400		
	Gas Oil - Heating (business)	>10mg/kg sulphur content	per 1000 litres	18.4854		
		<=10mg/kg sulphur content	per 1000 litres	17.1022		
		Energy intensive business[4]	per 1000 litres	0		
		>10mg/kg sulphur content, non-energy intensive business[5]	per 1000 litres	9.2427		
		<=10mg/kg sulphur content, non-energy intensive business[5]	per 1000 litres	8.5511		
	Gas Oil - Heating (non-business)	>10mg/kg sulphur content	per 1000 litres	18.4854	71.92	0.019%
		<=10mg/kg sulphur content	per 1000 litres	17.1022		
	Kerosene - Propellant use		per 1000 litres	626.8781	0.27	0.0001%
	Kerosene - Industrial/Commercial use	Energy intensive business[4]	per 1000 litres	0		

Tax Type	Tax Object	Additional Details	Unit	Tax Rate (€)	Tax Revenue 2012	
					(€ million)[1]	GDP Equivalent[2]
		Non-energy intensive business[5]	per 1000 litres	11.3400		
		Other businesses	per 1000 litres	22.6800		
	Kerosene - Heating (business)	Energy intensive business[4]	per 1000 litres	0		
		Non-energy intensive business[5]	per 1000 litres	9.6917		
		Other businesses	per 1000 litres	19.3833		
	Kerosene - Heating (non-business)		per 1000 litres	19.3833	1.31	0.0003%
	Heavy Fuel Oil - Heating (business)	Energy intensive business[4]	per 1000 kg	0		
		Non-energy intensive business[5]	per 1000 kg	8.1000		
		Other businesses	per 1000 kg	16.2000		
		Production of electricity	per 1000 kg	16.2000		
	Heavy Fuel Oil - Non-business		per 1000 kg	16.2000	0.6	0.0002%
	LPG - Propellant use		per 1000 kg	0	0.48	0.0001%
	LPG - Industrial/Commercial use	Energy intensive business[4]	per 1000 kg	0		
		Non-energy intensive business[5]	per 1000 kg	22.1400		
		Other businesses	per 1000 kg	44.2800		
	LPG - Heating (business)	Propane	per 1000 kg	18.7407	2.4	0.0006%
		Butane	per 1000 kg	18.4731		
		Energy intensive business[4]	per 1000 kg	0		
		Propane - non-energy intensive business[5]	per 1000 kg	9.3703		
		Butane - non-energy intensive business[5]	per 1000 kg	9.2365		
	LPG - Heating (non-business)	Propane	per 1000 kg	18.7407		

Tax Type	Tax Object	Additional Details	Unit	Tax Rate (€)	Tax Revenue 2012	
					(€ million)[1]	GDP Equivalent[2]
		Butane	per 1000 kg	18.4731		
Excise Duty on Natural Gas	Propellant use		per MWh	0	0.01	0.000003%
	Industrial/Commercial use		per MWh	0		
	Heating (business)	Energy intensive business[4]	per MWh	0		
		Non-energy intensive business[5]	per MWh	0.0942		
		Other businesses	per MWh	0.9889		
	Heating (non-business)		per MWh	0.9889	69.98	0.019%
Excise Duty on Electricity	Business use	Supplied to end user connected to high-voltage transport or distribution network > 1 kV	per MWh	0	50.19	0.013%
		Supplied to end user connected to high-voltage transport or distribution network ≤ 1 kV, energy intensive businesses[4]	per MWh	0		
		Supplied to end user connected to high-voltage transport or distribution network ≤ 1 kV, non-energy intensive businesses[5]	per MWh	0.9544		
		Supplied to end user connected to high-voltage transport or distribution network ≤ 1 kV, other businesses	per MWh	1.9088		
	Non-business use		per MWh	1.9088		
Excise Duty on Solid Fuels	Heating (business)		tonne	11.6526	12.4	0.003%
	Heating (non-business)		tonne	0		
Excise Duty on other Energy Products					369.47	0.098%

Tax Type	Tax Object	Additional Details	Unit	Tax Rate (€)	Tax Revenue 2012	
					(€ million)[1]	GDP Equivalent[2]

Notes:

1. *Revenues provided on request by the Department of the Federal Public Service Finance.*
2. *All % GDP values in this section are calculated using data from: Eurostat (2013) GDP and Main Components - Current Prices [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAMA_GDP_C.*
3. *Biofuel - tariff for petrol mixed with a fixed percentage of bio-ethanol (at least 7% volume) produced by authorized production units*
4. *Energy intensive businesses – only applies to businesses with an environmental objectives agreements or who have implemented tradable permit schemes.*
5. *Non-energy intensive businesses – only applies to businesses with an environmental objectives agreements or who have implemented tradable permit schemes.*

Source: Belgian Federal Public Service Finance (2013) T5 Tax Survey, Nr. 25 (update) 2013, *October 2013, http://docufin.fgov.be/intersalgen/thema/publicaties/memento/pdf/TS2013_V10_entire.pdf, p. 234-241.*

All end users pay federal contributions on electricity; however, large-quantity users are charged a degressive rate. Reductions of up to 45% (for the highest energy consumption bracket) are possible, and taxes are paid up to a ceiling of €250 thousand (i.e. companies do not have to pay for any taxes above this maximum amount).[677] It is worth noting that this ceiling is not set per facility, but per location, so, for example, one company with two energy-intensive plants in Belgium would benefit from this ceiling more than once.

- The federal contribution rates and revenues are presented in Table 153. The following reductions apply:
  - 20 MWh per year to 50 MWh per year: 15% reduction on the normal rate;
  - 50 MWh per year to 1,000 MWh per year: 20% reduction on the normal rate;
  - 1,000 MWh per year to 25,000 MWh per year: 25% reduction on the normal rate; and
  - Over 25,000 MWh per year: 45% reduction on the normal rate.

Table 153: Tax Rates and Revenues for Federal Contributions on Electricity (2013)

Tax Type	Tax Rate (€/MWh)	Tax Revenue 2012	
		(€ million)[678]	GDP Equivalent
Funding of the Commission for the regulation of electricity and natural gas (CREG)	0.1424	7.50	0.002%
Surcharge for protected customers	0.9786	70.78	0.019%
Financing denuclearization	1.4001	50.80	0.014%
Charge for federal climate politics	0	18.10	0.005%
Social public service charge	0.4570	30.32	0.008%
Heating subsidy	0	3.84	0.001%
Total Federal Contribution	2.9781	181.34	0.048%

Source: CREG (2013) Federal Contribution Electricity, January 2013, Accessed 2nd January 2014, p.1, http://www.creg.be/nl/cotfede1.html

- Federal contributions on gas are paid by all users with no degressivity. The federal contribution rates and revenues are presented in Table 154.

[677] CREG (2013) *Federal Contribution*, Accessed 2nd January 2014, www.creg.be/nl/cotfede1.html

[678] CREG (2013) *CREG Annual Report 2012*, April 2012, www.creg.be/nl/ra.html

Table 154: Tax Rates and Revenues for Federal Contributions on Gas (2013)

Tax Type	Tax Rate (€/MWh)	Tax Revenue 2012	
		(€ million)[679]	GDP Equivalent
Funding of the Commission for the regulation of electricity and natural gas (CREG)	0.0253	7.43	0.002%
Social public service charge	0.1102	22.14	0.006%
Surcharge for protected customers	0.3419	131.00	0.035%
Heating subsidy	0	3.31	0.001%
Total Federal Contribution	0.4774	163.88	0.044%

Source: CREG (2013) Federal Contribution, Accessed 2nd January 2014, http://www.creg.be/nl/cotfede1.html

- Various other charges are in place at federal and regional levels. Tax rates and revenues are listed in Table 155.

[679] CREG (2013) *CREG Annual Report 2012*, April 2012, www.creg.be/nl/ra.html

Table 155: Tax Rates and Revenues for other Energy Taxes (2013)

Tax Object	Tax Type	Federal or Regional	Further Details	Unit	Current Tax Rate (€)	Tax Revenue 2012	
						(€ million)[1]	GDP Equivalent
Electricity	Charge for the public service obligation for the funding of the connection of the offshore wind power plants to the grid	Federal		Per MWh	0.1395		
	Charge for the public service obligation for the funding of the (federal) green certificates	Federal		Per MWh	2.2133		
	Charge for the funding of energy efficiency measures	Flanders	Large industrial consumers (high-voltage) are exempt	Per MWh	0.0245		
	Charge for the funding of renewable energy production measures	Flanders	Large industrial consumers (high-voltage) are exempt	Per MWh	0.5171		
	Electricity: charge for the funding of renewable energy policy	Wallonia	Large industrial consumers (high-voltage) are exempt	Per MWh	13.8159		
Petrol and gas oil for motor vehicles and heating oil	FAPETRO charge (mineral oil quality check)	Federal	Payable by producers of oil products	Per 1000 litres	0.25		
Petrol	APETRA (international obligation of stockholding of crude oil)	Federal	Payable by producers of oil products	Per 1000 litres	11.30[2]	185.40[3]	0.05%
Gas oil		Federal	Payable by producers of oil products	Per 1000 litres	12.25[2]		

Tax Object	Tax Type	Federal or Regional	Further Details	Unit	Current Tax Rate (€)	Tax Revenue 2012	
						(€ million)[1]	GDP Equivalent
Kerosene		Federal	Payable by producers of oil products	Per 1000 litres	6.13[2]		
Oil Fuel		Federal	Payable by producers of oil products	Per 1000 litres	9.97[2]		
Petrol	BOFAS charge (soil sanitation)	Federal	Payable by producers of oil products	Per 1000 litres	1.97		
Diesel		Federal	Payable by producers of oil products	Per 1000 litres	3.22		

Notes:

1. *Revenues provided on request by the Department of the Federal Public Service Finance*
2. *Tax rates for 01/01/14 – 31/03/201*
3. *Revenues obtained from APETRA (2012) Verslag va de Raad van Bestuur aan de ALgemene Vergadering Betreffende de Jaarrekening 2012 va APETRA, Naamloze Vennootschap van Publiek Recht me Sociaal Oogmergk, www.apetra.be/images/stories/20130426_verslag_rvb_aan_de_av_jaarrekening_2012.pdf*

Sources:

Electricity: ELIA (2013) "Rates for Public Service Obligations" and "Taxes and Charges", Accessed 2nd January 2014, pp.1-4, http://www.elia.be/nl/producten-en-diensten/toegang/~/media/files/Elia/Products-and-services/Tarieven/Toeslagen_2013_NL_v2.pdf

FAPETRO: Economie (2013) FAPETRO, Accessed 2nd January 2014, http://economie.fgov.be/nl/ondernemingen/energie/Niet-hernieuwbare_energie_Aardolie/Fapetro/

APETRA: Economie (2013) APETRA, Accessed 2nd January 2014, http://economie.fgov.be/nl/ondernemingen/energie/Niet-hernieuwbare_energie_Aardolie/APETRA/#.UsahHLTvgyw

BOFAS: Economie (2013) BOFAS, Accessed 2nd January 2014, http://economie.fgov.be/nl/ondernemingen/energie/Niet-hernieuwbare_energie_Aardolie/BOFAS/

A.6.2 Transport (excl. transport fuels)

- Registration:
  - A tax is levied on the entry, re-entry, of vehicles into service on public roads and applies to both new and second hand cars. The basis of assessment for the tax varies across regions. The Walloon region, for example, uses a system which includes the ecobonus and ecomalus schemes. An ecobonus is granted, or an ecomalus is levied under certain circumstances. Both are payable upon the entry of a new or used vehicle into service, with a rate dependent upon the emissions category of the vehicle. The tax rates for each type of vehicle have a complex structure and interested readers are referred to the cited reference for further details.[680] Tax revenues in 2012 totalled €371 million, equivalent to 0.10% of GDP.[681]
- Circulation:
  - An annual motor vehicle tax (tax on traffic circulation) is levied on all motor vehicles used for the carriage of passengers or goods by road. The tax rate varies according to the size and type of vehicle. Various exemptions apply depending on the region. The tax rates for each type of vehicle have a complex structure The tax rates for each type of vehicle have a complex structure and interested readers are referred to the cited reference for further details.[682] Tax revenues derived from businesses in 2012 totalled €505 million, equivalent to 0.14% of GDP.[683] Revenues from households
  - in the same year amounted to a total of €1,017 million, equivalent to 0.27% of GDP.[684] The total revenue derived from circulation taxes therefore amounted to €1,521 million (equivalent to 0.40% of GDP).
- Charges and fees:

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[680] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=38/1357119656&taxType=Other+indirect+tax

[681] National Bank of Belgium (2014) *Macroeconomic Statistics*, Accessed 25th January 2014, www.nbb.be/belgostat/PublicatieSelectieLinker?LinkID=972000064|910000082&Lang=E

[682] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=39/1357119656&taxType=Other+indirect+tax

[683] National Bank of Belgium (2014) *Belgostat Online*, Accessed 25th January 2014, www.nbb.be/belgostat/PublicatieSelectieLinker?LinkID=972000064|910000082&Lang=E

[684] National Bank of Belgium (2014) *Belgostat Online*, Accessed 25th January 2014, www.nbb.be/belgostat/PublicatieSelectieLinker?LinkID=972000064|910000082&Lang=E

- The eurovignette consists of a levy on motor vehicles and combinations of vehicles which are exclusively used for the transportation of goods by road and whose maximum authorized mass is at least 12 tonnes. Rates are dependent on the number of axles as well as the emissions category of the vehicle (Table 156).[685] Tax revenues in 2012 totalled €114 million, equivalent to 0.03% of GDP.[686]

Table 156: Eurovignette Tax Rates (€, 2013)

Vehicle Emissions Rating	Annually		Quarterly (*)		Monthly		Weekly		Daily
	Number of Axels								
	≤ 3	≥ 4	≤ 3	≥ 4	≤ 3	≥ 4	≤ 3	≥ 4	
For vehicles registered in Belgium									
Emission norm non-EURO	960	1,550	288	465	-	-	-	-	-
Emission norm EURO I	850	1,400	255	420	-	-	-	-	-
Emission norm EURO II and cleaner	750	1,250	225	375	-	-	-	-	-
For vehicles registered in other countries but covered by a Belgian trader's number plate or a temporary number plate									
Emission norm non-EURO	960	1,550	-	-	96	155	26	41	8
Emission norm EURO I	850	1,400	-	-	85	140	23	37	8
Emission norm EURO II and cleaner	750	1,250	-	-	75	125	20	33	8

A.6.3 Pollution and Resources

- Taxes on landfilling and incineration are in place in both Flanders and Wallonia. Brussels Capital Region is understood to be in the process of introducing a tax on incineration at €6 per tonne. The incineration taxes vary between €1 and €30 per tonne, depending on the region and the type of

[685] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=737/1357119656&taxType=Other+indirect+tax

[686] National Bank of Belgium (2014) *Belgostat Online*, Accessed 25th January 2014, www.nbb.be/belgostat/PresentationLinker?Presentation=HTML&TableId=972000066&Lang=E

waste being incinerated (see Table 157).[687,688] Landfill tax for non-hazardous residual waste in Flanders is currently (2014) €87.62 per tonne and in Wallonia it is slightly lower at €75.71 per tonne.[689] Tax revenues in 2012 for all landfill and incineration taxes totalled €52.90 million, equivalent to 0.014% of GDP.[690]

- Both Flanders and Wallonia operated a banded system and charge different landfill tax rates depending on the waste stream being landfilled. These rates are not summarised here but can be viewed in the cited references (2014 figures).[691]

Table 157: Incineration Taxes in Wallonia and Flanders

Waste Stream	Tax Rate (€ per tonne)
Wallonia (2014 rates)	
Non-hazardous waste with energy recovery	€9.89
Hazardous waste with energy recovery	€29.31
Non-hazardous waste without energy recovery	€61.06
Hazardous waste with energy recovery	€73.27
Healthcare and hospital waste	€0 (exempted from the tax)
Co-incineration of hazardous wastes	€8.24
Non-hazardous waste, unauthorised	€183.2
Hazardous waste, unauthorised	€732.7
Wastes from soil remediation operations with / without energy recovery	€2.2 / €3.3
Flanders (2014 rates)	
Hazardous or non-household	€8.18
Commercial waste	€8.18
Recycling residues	€2.34

687 Bruxelles Environnement (2010) *Plan de Prévention et de Gestion des Déchets*, May 2010, www.bruxellesenvironnement.be/Templates/etat/niveau2.aspx?id=3048&langtype=2060, p. 45.

688 OVAM (2013), Wetgeving Milieuheffingen (*Legislation Environmental Levies*), Acessed 24th January 2014, www.ovam.be/jahia/Jahia/cache/offonce/pid/176?actionReq=actionPubDetail&fileItem=2981

689 European Environment Agency (2013) Typical Charge (Gate Fee and Landfill Tax) for Legal Landfilling of Non-hazardous Municipal Waste in EU Member States and Regions, February 2013, http://www.eea.europa.eu/data-and-maps/figures/typical-charge-gate-fee-and

690 National Bank of Belgium (2014) *Belgostat Online*, Accessed 25th January 2014, www.nbb.be/belgostat/PresentationLinker?Presentation=HTML&TableId=972000066&Lang=E

691 Milieuheffingen 2014; Region Wallonne, Moniteur Belge, 22.01.2014, pp.5494-5497.

Source: Flanders: OVAM (2013), Wetgeving Milieuheffingen (Legislation Environmental Levies), Acessed 24th January 2014, www.ovam.be/jahia/Jahia/cache/offonce/pid/176?actionReq=actionPubDetail&fileItem=2981;Wallonia: Region Wallonne, Moniteur Belge, 22.01.2014, pp.5494-5497.

- Beverage packaging is subject to a levy.[692] The tax rate is €9.86 per hectolitre for non-reusable packaging, and €1.41 per hectolitre for reusable packaging.[693] Tax revenues in 2012 totalled €317.69 million, equivalent to 0.085% of GDP.[694]
- A number of disposable products are subject to an environmental levy. The following rates apply: plastic bags (€3 per kg); disposable cutlery (€3.6 per kg); aluminium foils (€4.5 per kg); other foils (€2.7 per kg).[695] Tax revenues in 2012 totalled €13.58 million, equivalent to 0.0036% of GDP.[696]
- A regional tax applies to the disposal of wastewater. In Flanders the tax rate is set at €0.84 per m^3 of wastewater disposed.[697] In Wallonia, the tax rate is set at €0.5542 per m^3 for domestic wastewater disposal where this does not originate from the public water supply. For waste from the public waste water supply, the applicable rate since January 2013 is €1.565 per m^3 , whilst a rate of €8.92 per 'unit of pollution' applies for industrial wastewater. For this tax, the pollutant load (N) is calculated using the following formula : N = N1 + N2 + N3 + N4, where:
    - - N1 is the number of unit pollutant loads due to the presence of suspended matter and oxidizable materials ;
    - - N2 is the number of unit pollutant loads due to the presence of heavy metals;
    - - N3 is the number of unit pollutant loads associated with the presence of nutrients ;
    - - N4 is the number of unit pollutant loads related to the difference in temperature between the wastewaters and receiving waters.

The values of the parameters N1 to N4 are the maximum values in the permit.

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692 OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

693 Federal Public Service Finance (2013) *Customs Duties, Excise and Various*, Accessed 10th January 2014, http://docufin.fgov.be/intersalgnl/thema/stat/Excel/TABDOU_w.XLS

694 Revenues provided on request by the Department of the Federal Public Service Finance.

695 Federal Public Service Finance (2013) *Customs Duties, Excise and Various*, Accessed 10th January 2014, http://docufin.fgov.be/intersalgnl/thema/stat/Excel/TABDOU_w.XLS

696 Federal Public Service Finance, Belgium (2013) Data Table Downloaded on 24th January 2014 from, http://docufin.fgov.be/intersalgnl/thema/stat/pdf/TABDOU_w.pdf

697 VMM (2013) *Tax FAQs*, Accessed 10th January 2014, www.heffingen.be/faq/faqs#wat-zijn-de-eenheidstarieven

- Agricultural waste water disposal is taxed at a rate dependent on the type of wastewater and the use or not of the wastewater for manure spreading.[698] Tax revenues in 2012 totalled €118.50 million, equivalent to 0.032% of GDP.[699]
- All 'packaging responsible businesses' are liable to pay an annual packaging prevention and management levy, set at €0.53 per inhabitant.[700] Tax revenues in 2012 totalled €3.22 million, equivalent to 0.00086% of GDP.[701]
- Flanders has in place a levy on the withdrawal of groundwater used for drinking purposes, with a tax rate of €0.095715 per litre.[702] A levy is also charged on the withdrawal of groundwater for agricultural and industrial uses, with a more complex tax rate structure. Tax revenues in 2012 totalled €24.55 million, equivalent to 0.007% of GDP.[703] Wallonia has an abstraction tax of 0.0756 €/m³ applied to "water intakes aimed at drinking water production" (prises d'eau potabilisable) and tariffs from 0.0248 €/m³ to 0.0744 €/m³ applied to "groundwater intakes for non-drinking water production", this rate increasing with volumes abstracted (volumes under 3,000 m³ are exempted)
-
  -
- A gravel levy, set at €0.6729 per tonne for valley gravel, and €0.456 per tonne for mountain gravel, is in place in Flanders.[704] Tax revenues in 2012 totalled €120 thousand, equivalent to 0.00003% of GDP.[705] Comments from a Wallonian representative indicate also that there may be local taxes in place on mines, but the details of these are not clear.

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[698] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[699] National Bank of Belgium (2014) *Belgostat Online*, Accessed 25th January 2014, http://www.nbb.be/belgostat/PresentationLinker?Presentation=HTML&TableId=972000066&Lang=E

[700] IVCIE (2013) *Cooperation Agreement*, November 2008, http://www.ivcie.be/admin/upload/page/file/395.pdf

[701] Department of Environment, Nature and Energy (2013) *DAB Minafonds: Jaarverslag 2012*, www.lne.be/beelden-en-documenten/jaarverslag_minafonds2012.pdf

[702] VMM (2013) *The Calculation of the Tax on the Extraction of Groundwater*, Accessed 10th January 2014, *http*://heffingen.be/gemeenschappelijk-landbouw-onderneming/de-berekening-van-de-heffing-op-de-winning-van-grondwater

[703] Department of Environment, Nature and Energy (2013) *DAB Minafonds: Jaarverslag 2012*, www.lne.be/beelden-en-documenten/jaarverslag_minafonds2012.pdf

[704] Flemish Environmental Administration (2013) *Decision of the Flemish Government Establishing the Charge Coefficient on Gravel*, December 2012, hwww.lne.be/themas/natuurlijke-rijkdommen/pdf-files/heffingscoefficientgrind.pdf

[705] Belgian Court of Audit (2013) Balans, www.rekenhof.be/Docs/Rekboek2012/083R_GRIND.pdf

A.6.4 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 7.2.2, we list here a complete list of subsidies identified in Belgium by the IEEP, and identified from information gathered from the Belgium country expert and from TAXUD Excise Duty Tables, for which financial information is not available:

Table 158: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
Subsidies for delivery vans	Country Expert	
Exemption of circulation tax for cars more than 25 years old	Country Expert	
Reduced energy taxes for large-scale users	Country Expert	The exemptions are for both energy and non-energy intensive businesses that have entered into agreements or are part of the ETS.
VAT exemption on air tickets	IEEP	
Exemptions on VAT on shipping	Country Expert	
Fuel-Tax Exemption for Regional Bus Transport	IEEP	
Subsidies that stimulate urban sprawl	IEEP	
Nuclear power - Limited liability for nuclear operators/producers.	IEEP	Operators are only obliged to cover EUR 330 million of the potential costs of a nuclear accident.
Subsidies for the modernisation of fishing vessels	IEEP	The grant represents up to 40% of the approved eligible costs. This subsidy has the potential to increase the ability of fishing vessels to catch fish, which may increase pressure on fish stocks to unsustainable levels.
Commercial diesel tax rate	TAXUD	€330 per 1000 litres ((from €406.3036 - 442.6880 per 1000 litres)
Energy tax exemption for energy products with dual use	Country Expert	(both motor or heating fuel and other purposes, e.g. for chemical reduction and metallurgic processes)
Energy tax exemption for electricity that is primarily used for chemical reduction and metallurgic processes	Country Expert	
Energy tax exemption for electricity and energy products used for mineralogical processes	Country Expert	
Energy tax exemption for energy products used for experiments to develop environmentally-friendly products or with renewable energy	Country Expert	
Energy tax exemption for electricity produced with renewable energy or CHP for own consumption	Country Expert	
Energy tax exemption for electricity and energy products used for combined heat power (CHP)	Country Expert	
Energy tax exemption for diesel, kerosene and heavy fuel used for dredging activities	Country Expert	

Sources: See Table 4 in IEEP (2013) Steps to Greening Country Report: Belgium, Report for the European Commission, p.13.

DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 159.

Table 159: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (€ million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for gas oil used for rail transport	TAXUD	Gas Oil - Transport - Railways	56	1000t	67,470	1000l	427.69	0	28.9
Excise tax exemption for fuels used in domestic navigation	OECD	Gas Oil - Transport - Domestic Navigation	37	1000t	44,578	1000l	427.69	0	19.1
Excise tax exemption for the residential use of coal	OECD	Coal and Coke and Lignite - Other - Households	159	1000t	41,022,000	GJ	0.40	0	16.4

Sources: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 75 - 81, dx.doi.org/10.1787/9789264187610-en

See Table 4 in IEEP (2013) Steps to Greening Country Report: Belgium, Report for the European Commission, p.13.

Eurostat (2013) Energy Balance Sheets 2010-11, 2013, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EN-13-001/EN/KS-EN-13-001-EN.PDF

A.6.5 Change in Tax Bases

Table 160: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	9,007	8,710	-297
Petrol	million litres	1,123	1,123	0
Kerosene	million litres	1,264	1,264	0
LPG	thousand tonnes	101	94	-7
Heavy Fuel Oil	thousand tonnes	158	153	-5
Natural Gas	TJ (GCV)	381,964	370,150	-11,814
Coal	thousand tonnes	1,292	1,185	-107
Electricity	GWh	53,831	53,831	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[706] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[706] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 50: Change in Internal Passenger Flights, flights per year

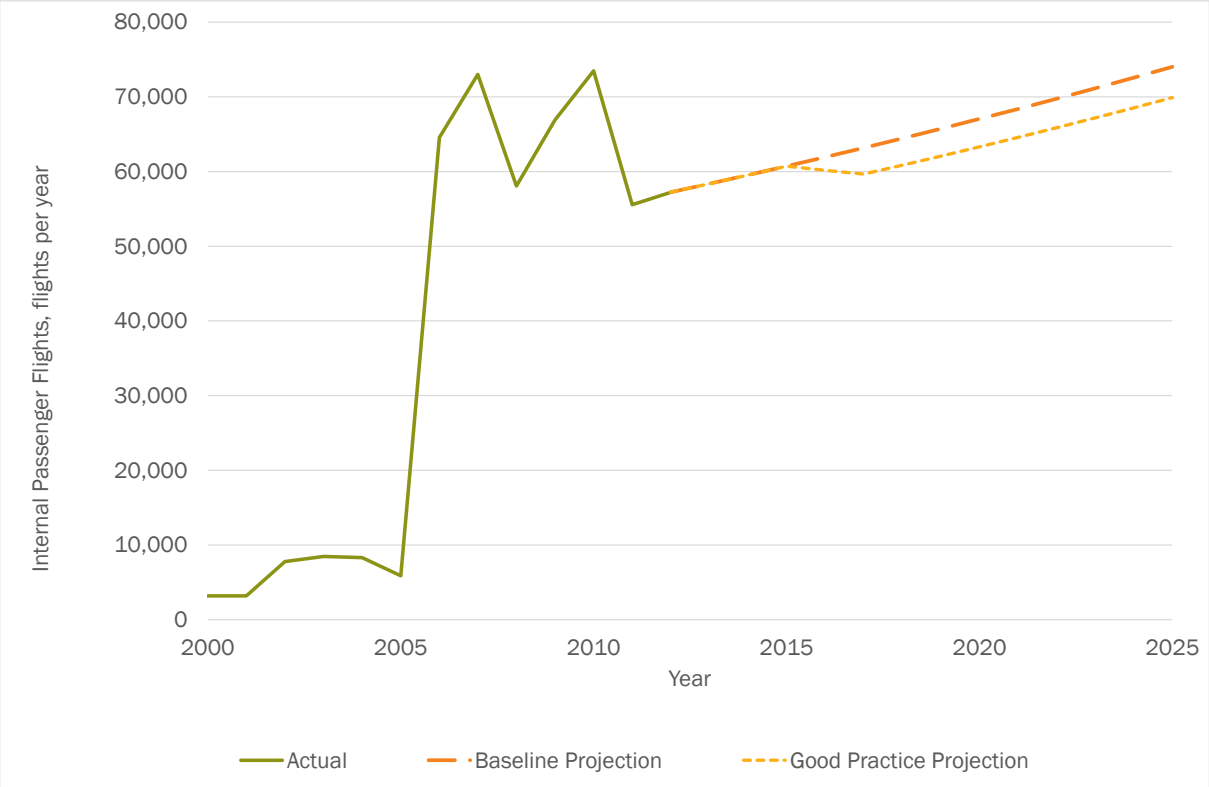

Figure 51: Change in Intra-EU Passenger Flights, flights per year

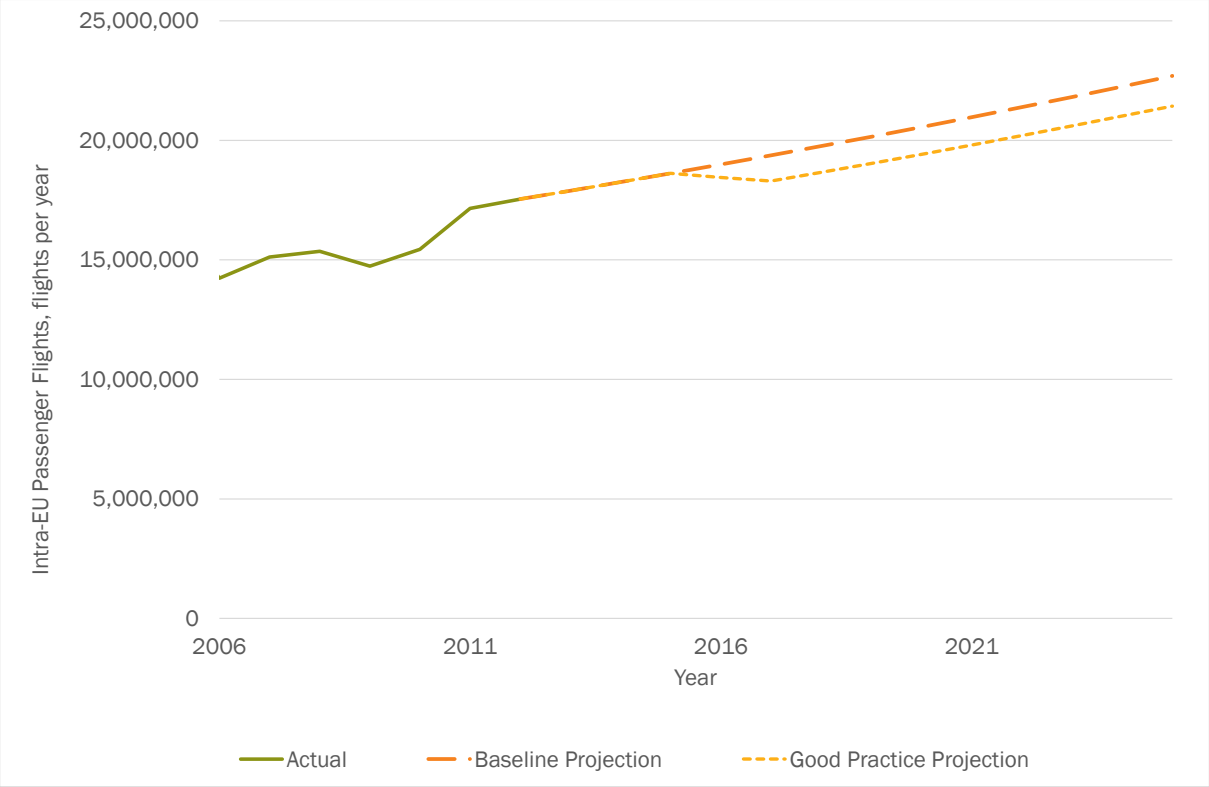

Figure 52: Change in Extra-EU Passenger Flights, flights per year

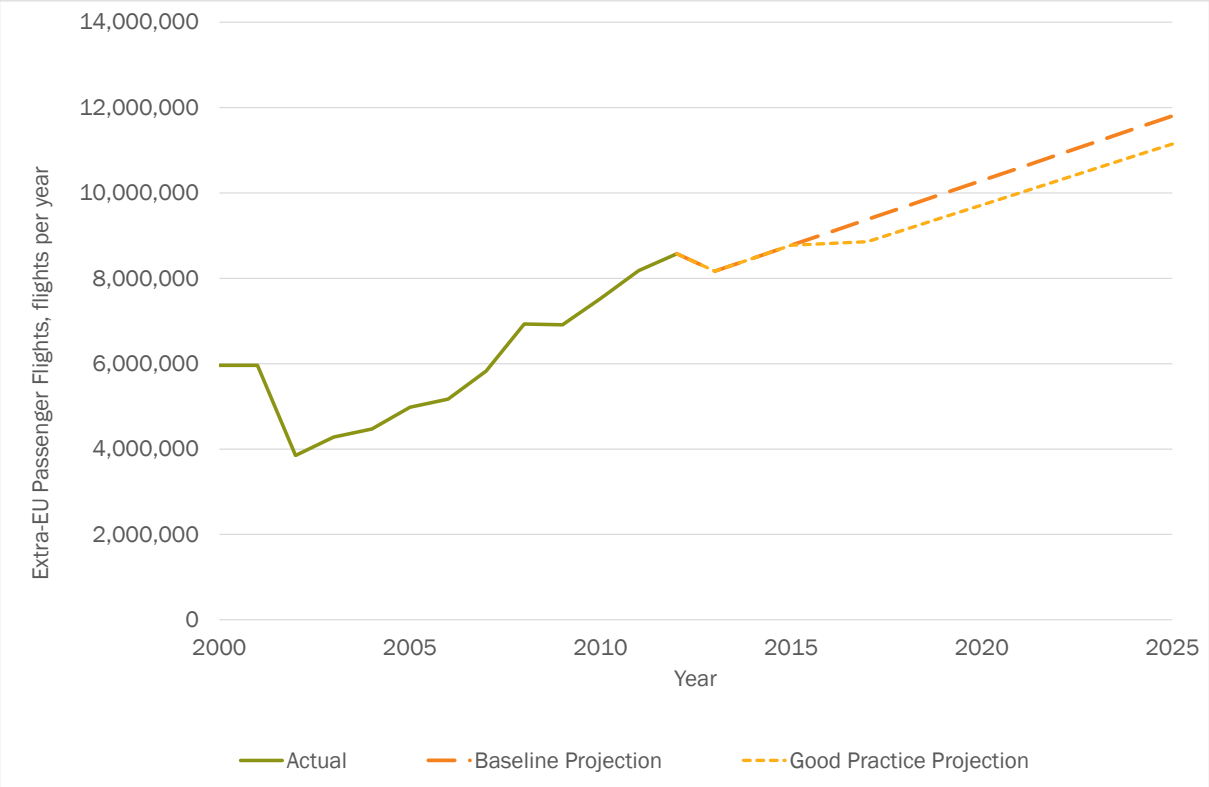

Figure 53: Change in Internal Air-freight, tonnes

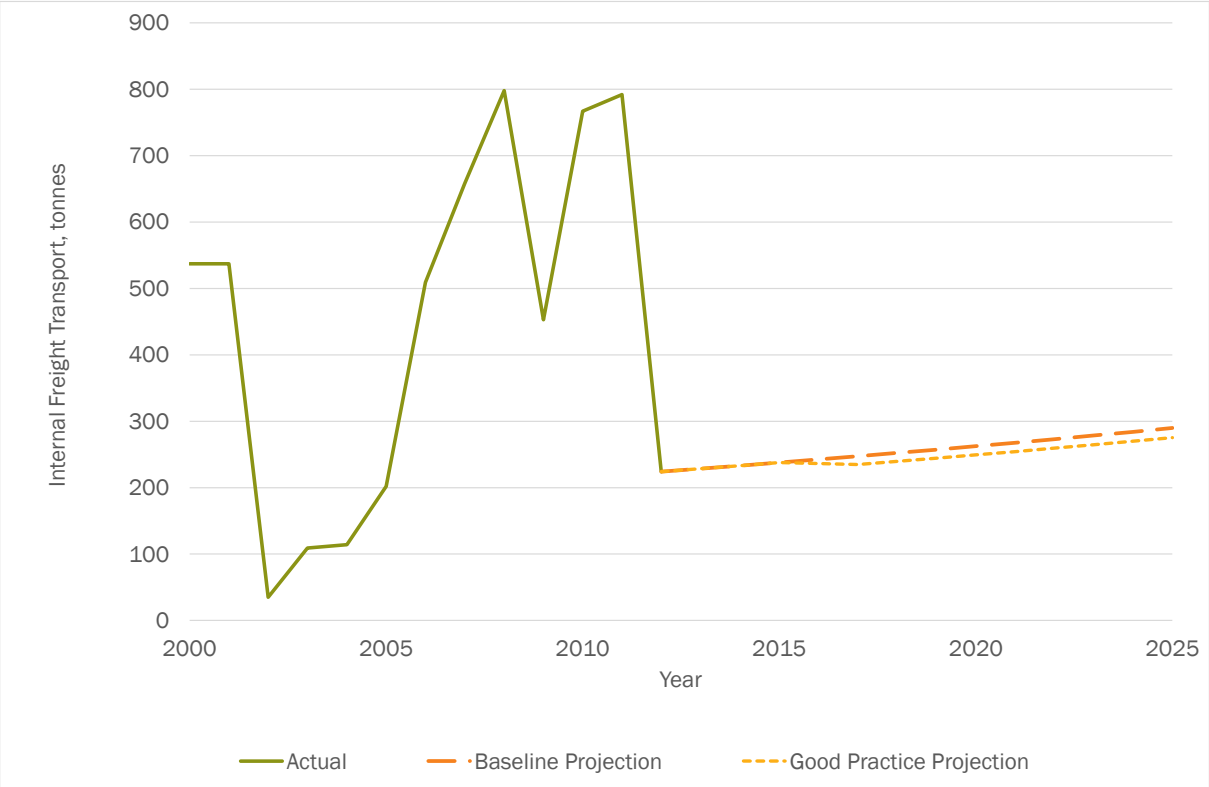

Figure 54: Change in Intra-EU Air-freight, tonnes

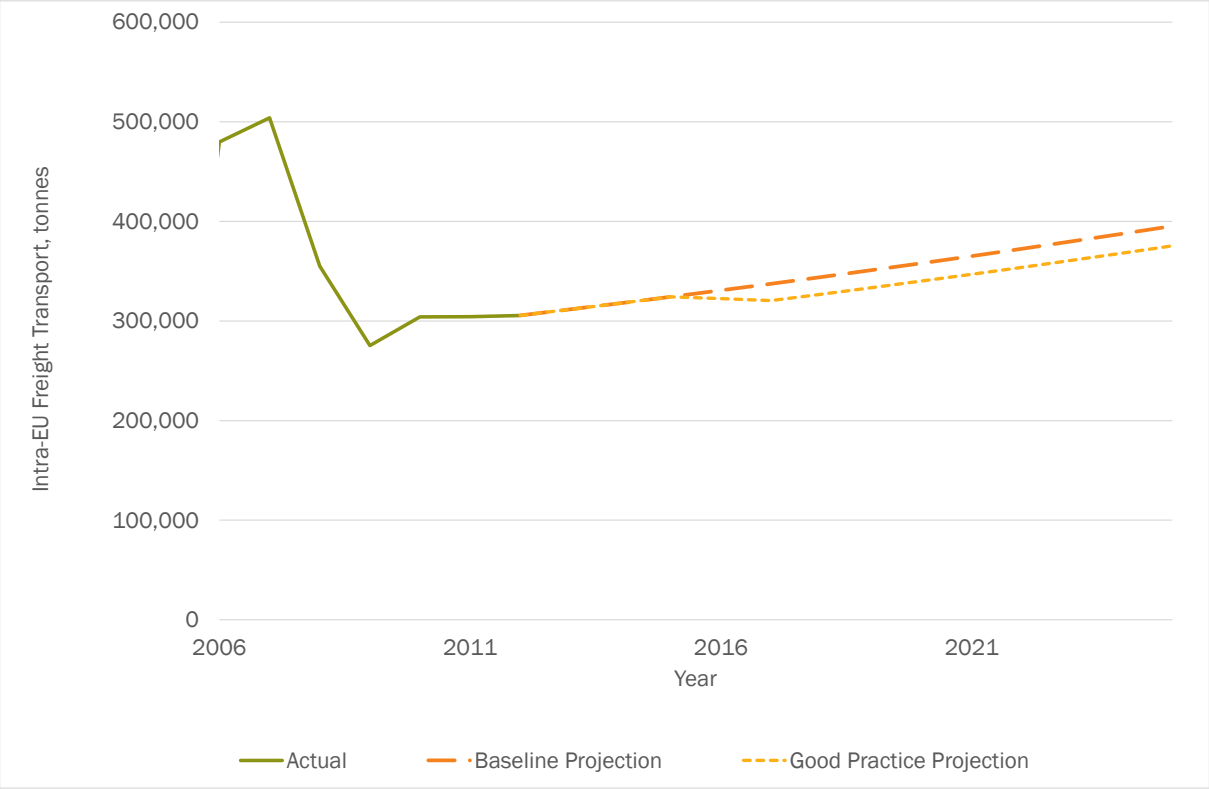

Figure 55: Change in Extra-EU Air-freight, tonnes

Figure 56: Change in MBT/ Incineration, thousand tonnes

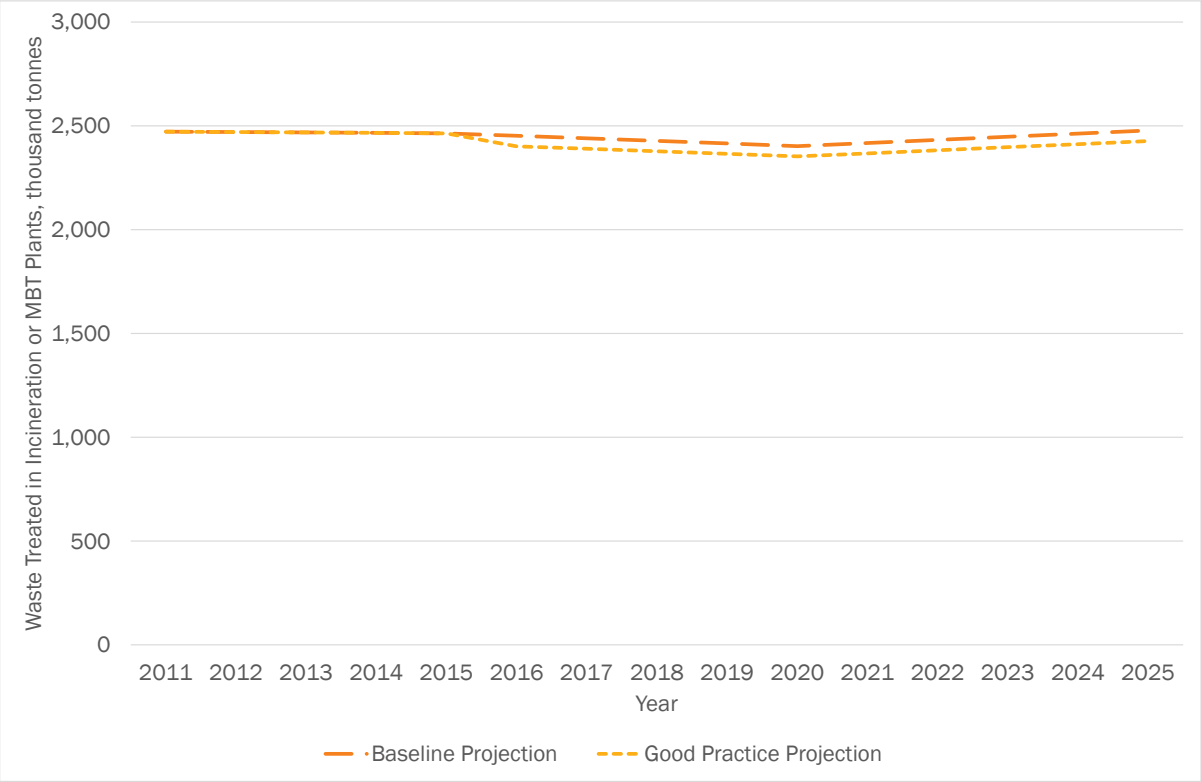

Figure 57: Change in SOx Emissions, tonnes

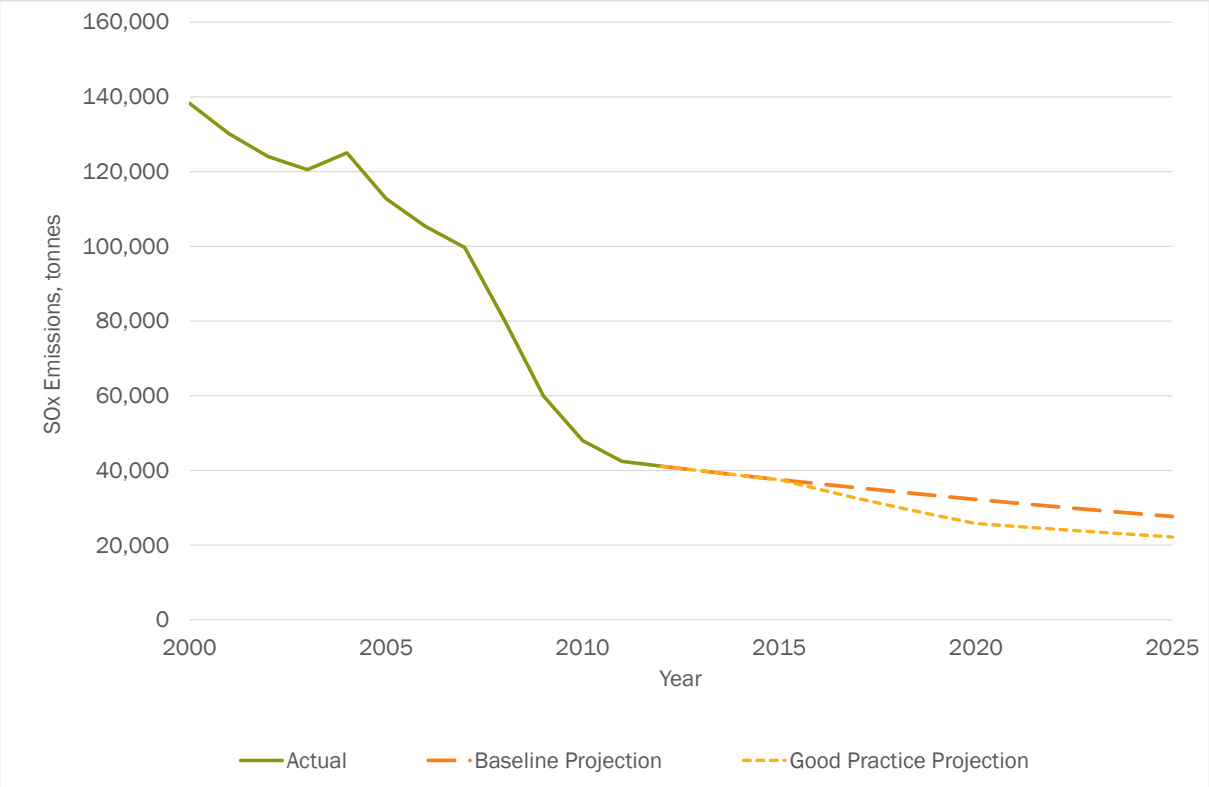

Figure 58: Change in NOx Emissions, tonnes

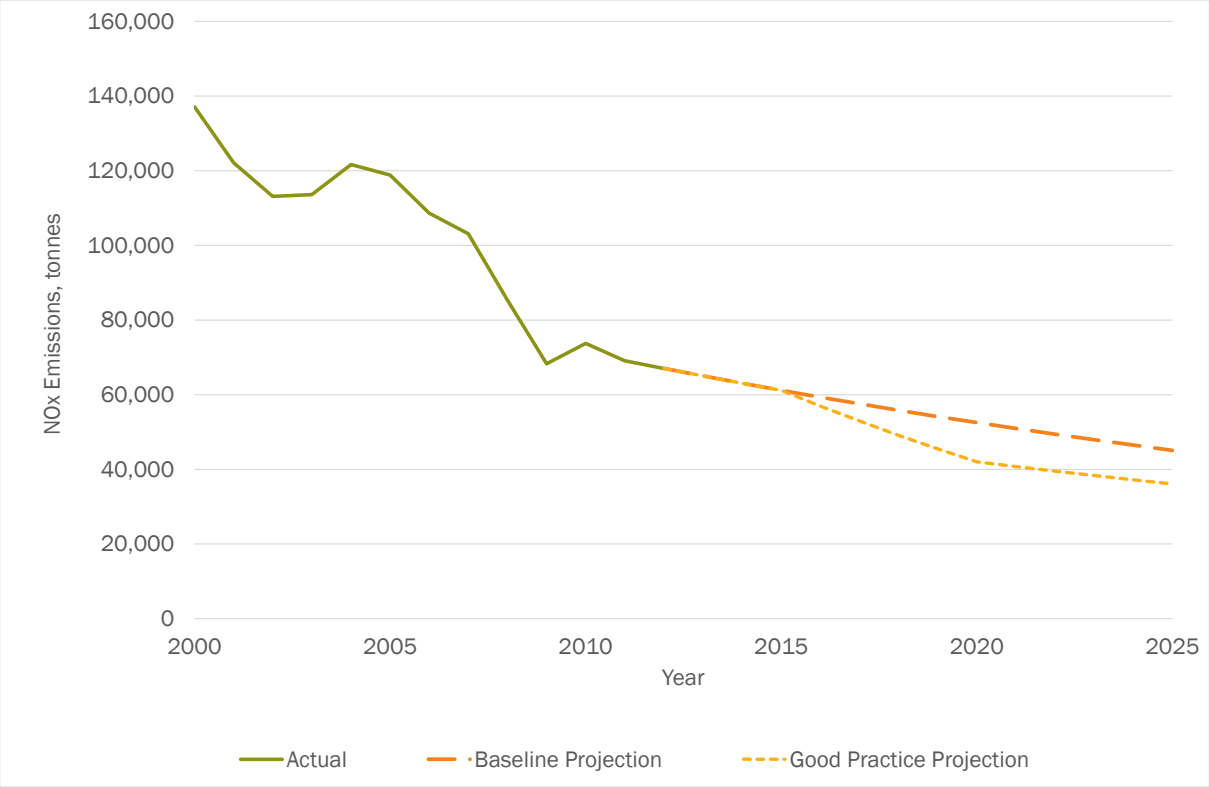

Figure 59: Change in PM_{10} Emissions, tonnes

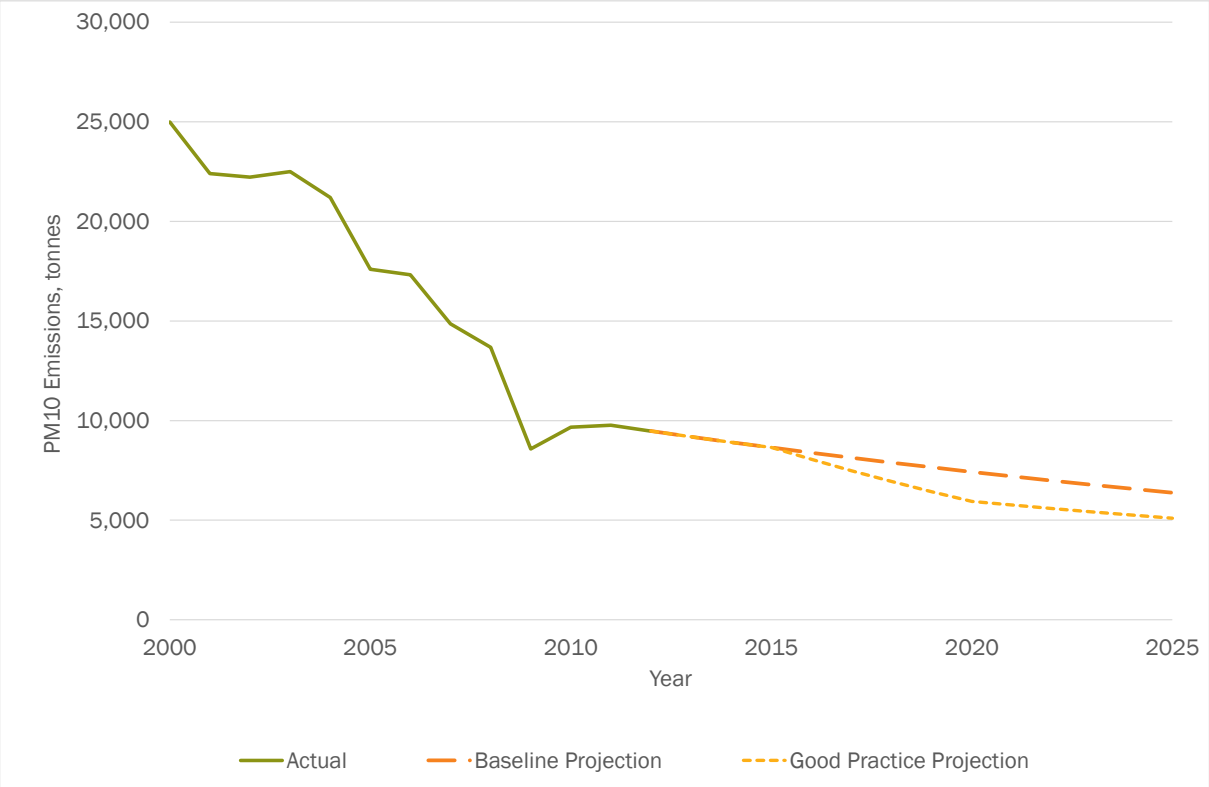

Figure 60: Change in Groundwater Abstraction – Public Supply, million cubic metres

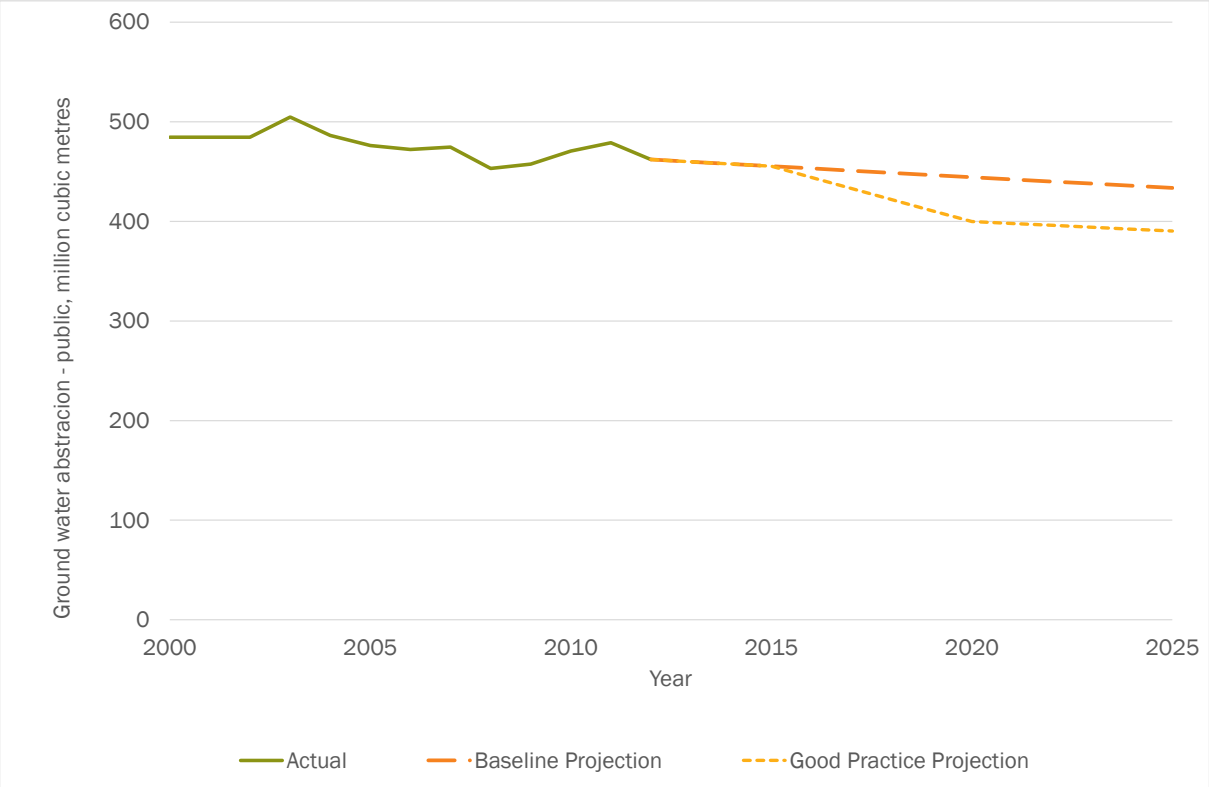

Figure 61: Change in Groundwater Abstraction – Manufacturing, million cubic metres

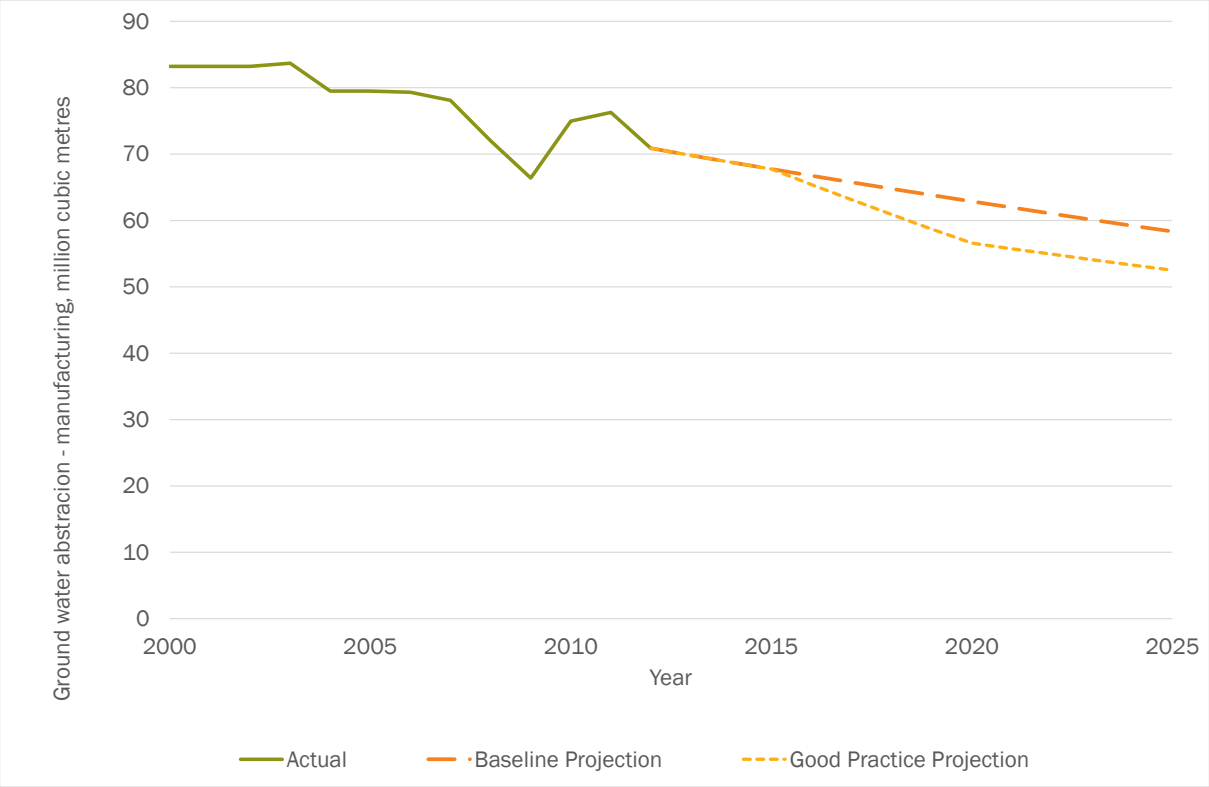

Figure 62: Change in Groundwater Abstraction – Agriculture, million cubic metres

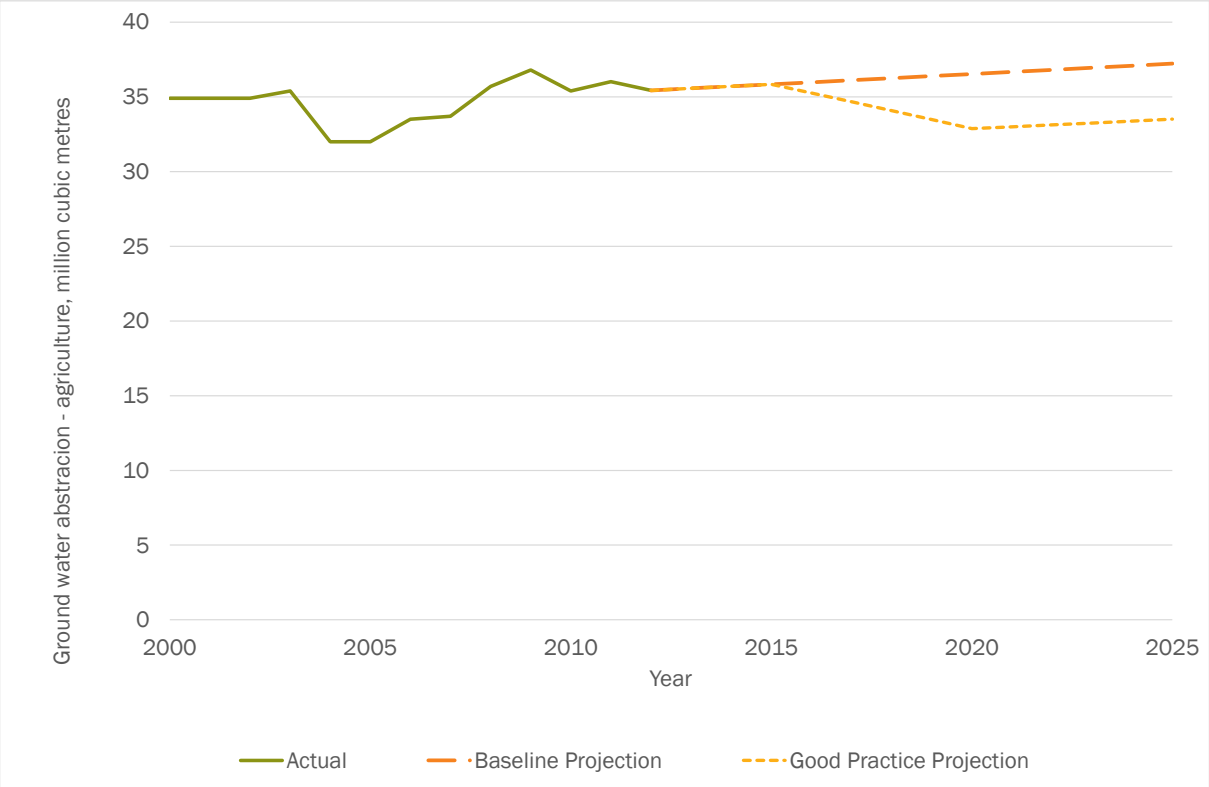

Figure 63: Change in Surface Water Abstraction – Public Supply, million cubic metres

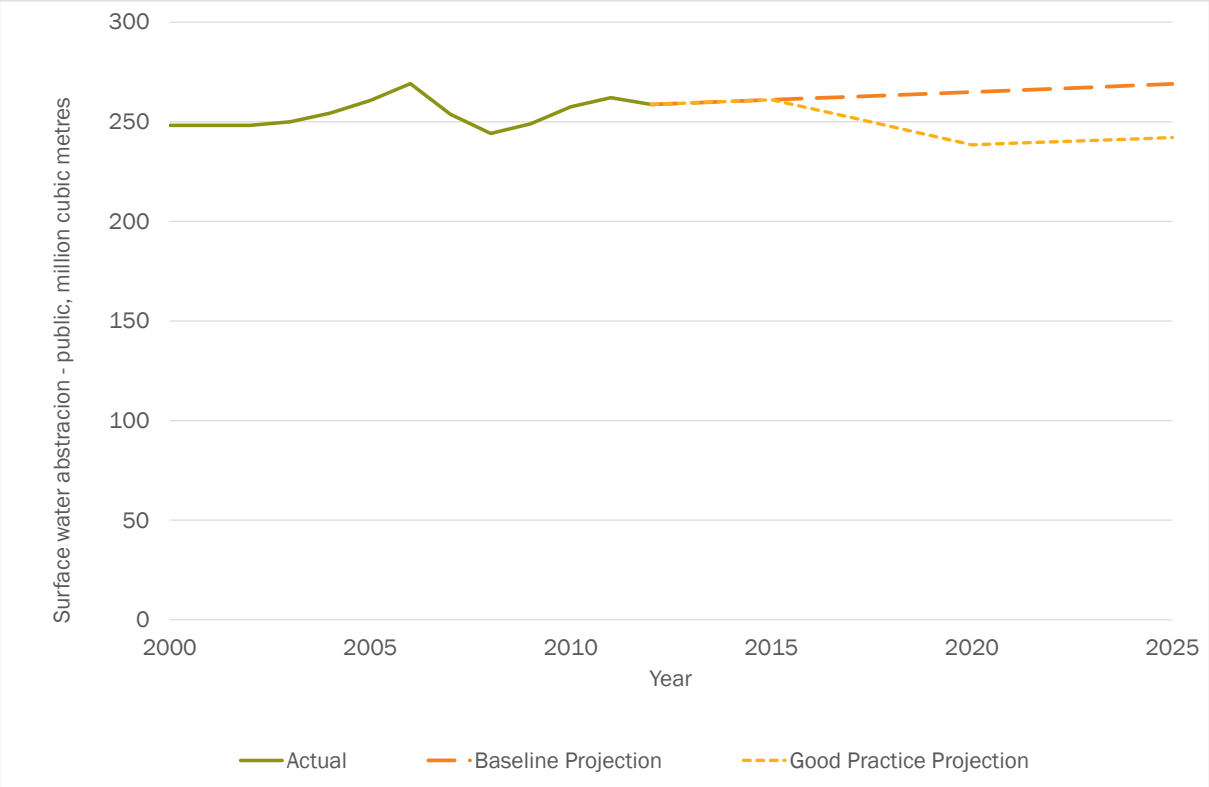

Figure 64: Change in Surface Water Abstraction – Manufacturing, million cubic metres

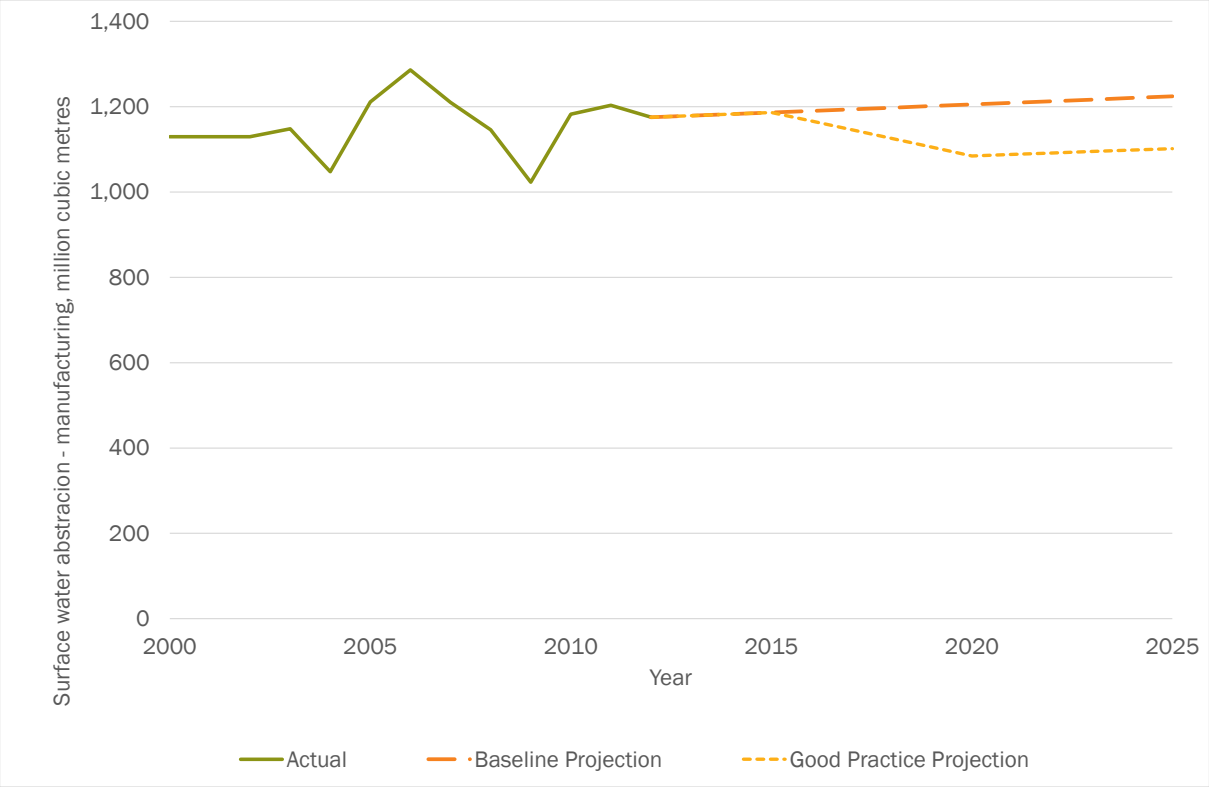

Figure 65: Change in Surface Water Abstraction – Agriculture, million cubic metres

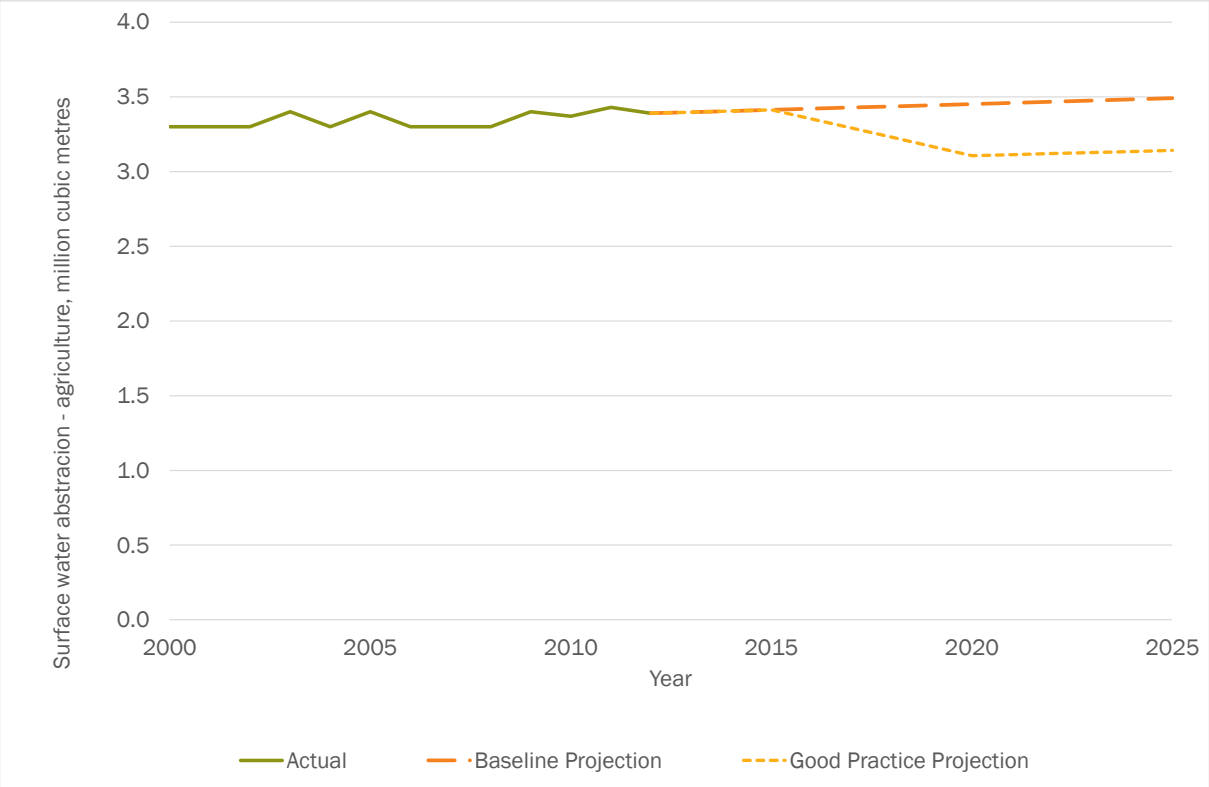

Figure 66: Change in Active Ingredients in Pesticides, tonnes

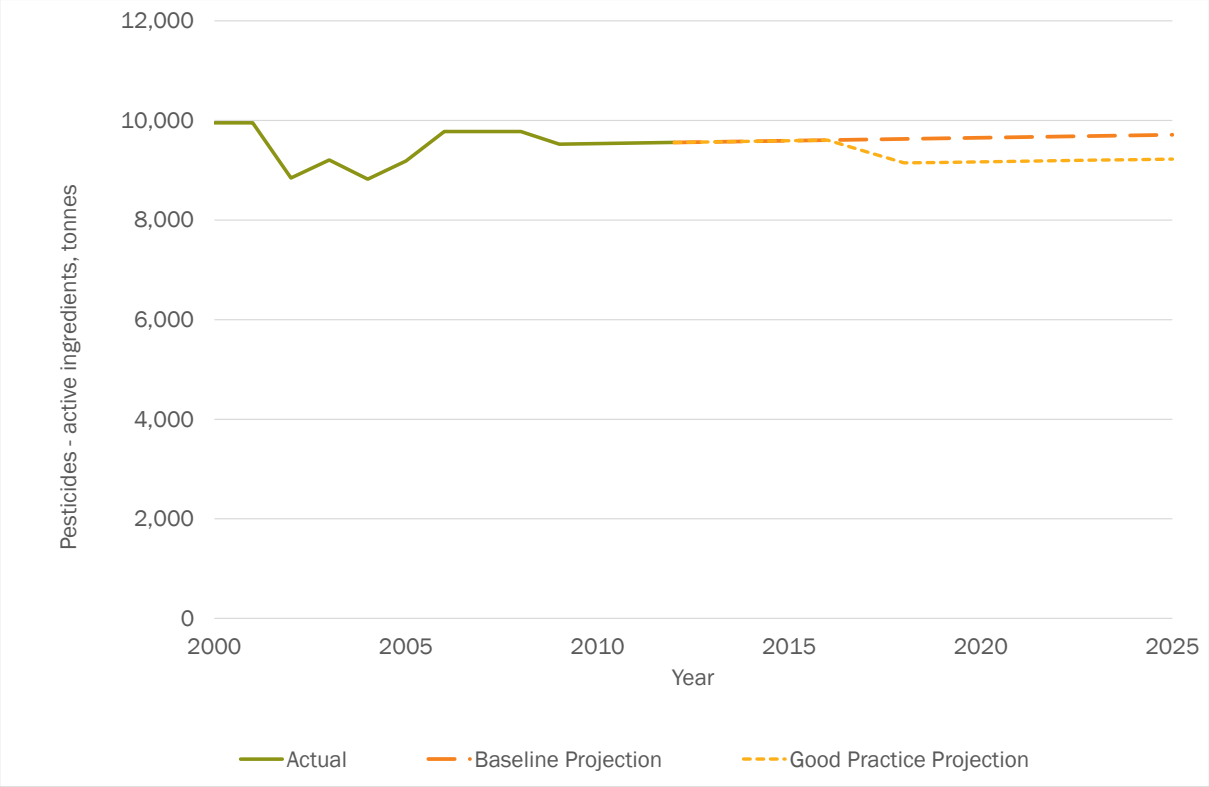

Figure 67: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

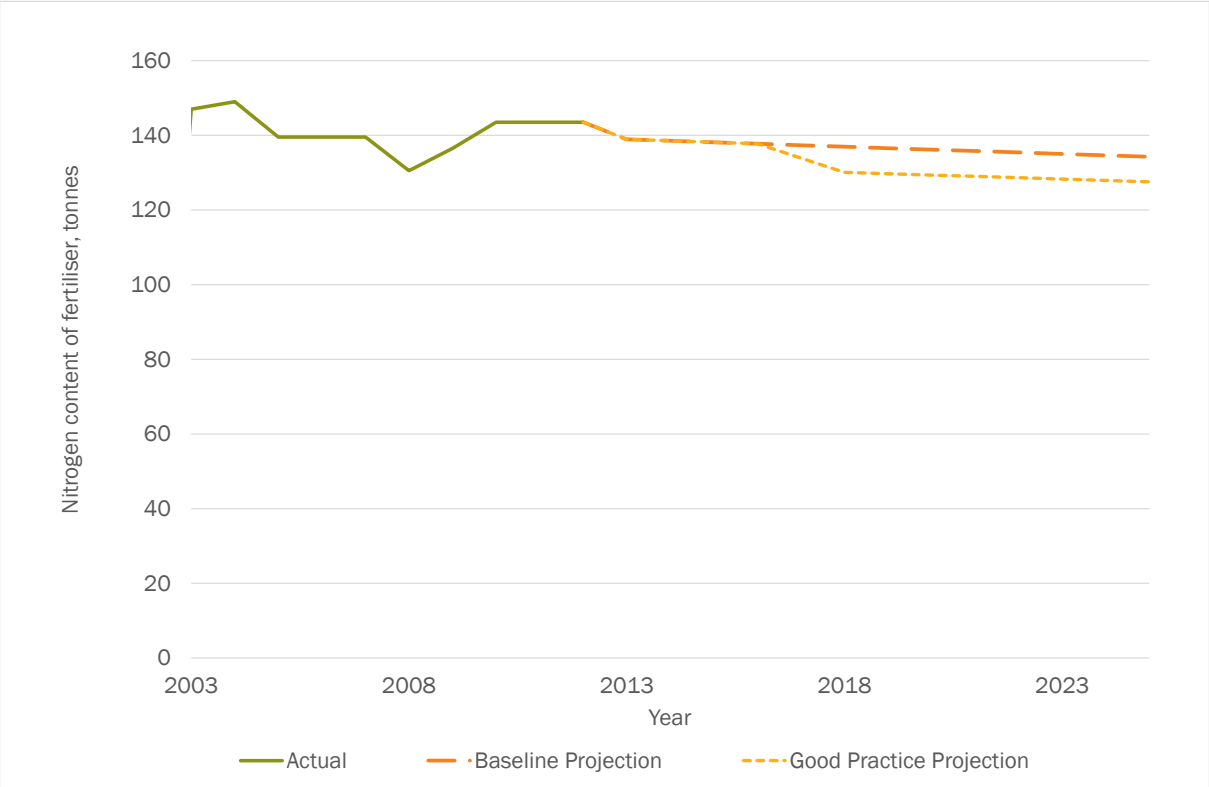

Figure 68: Change in Aggregates Extraction, thousand tonnes

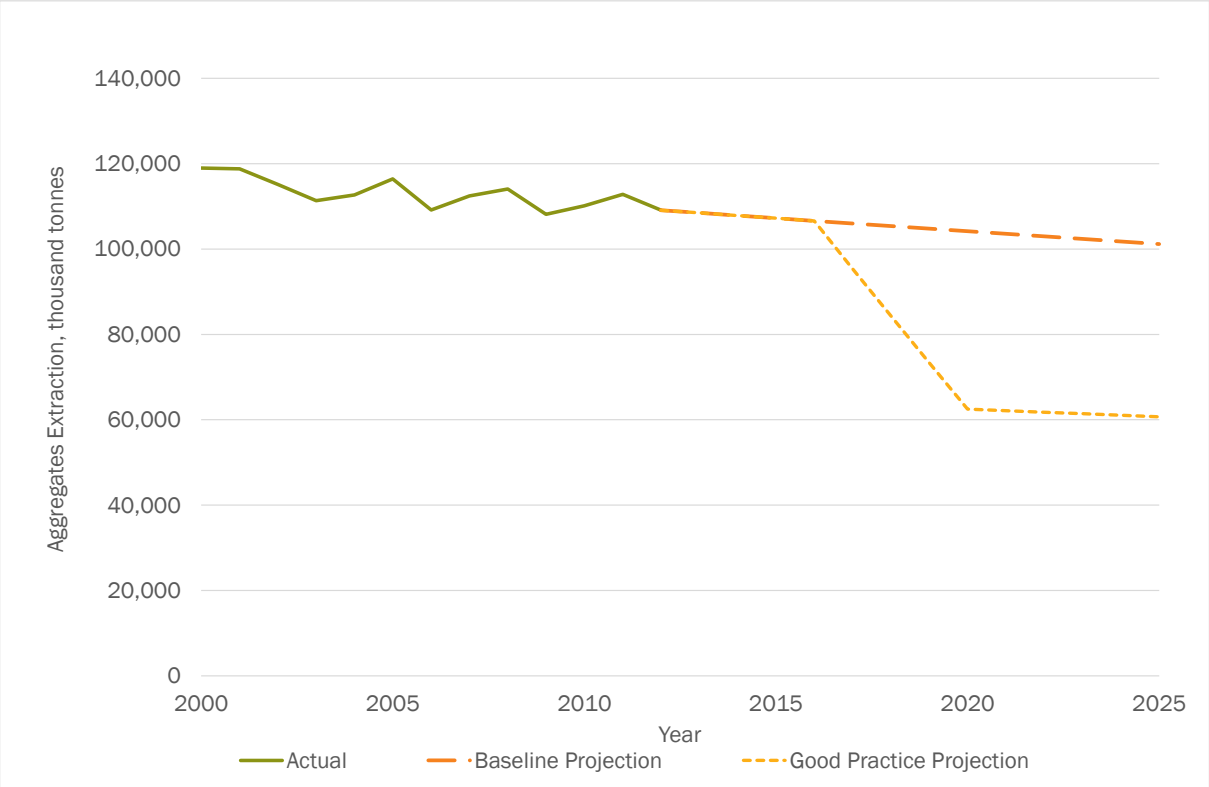

Figure 69: Change in Paper & Card Packaging Generation, thousand tonnes

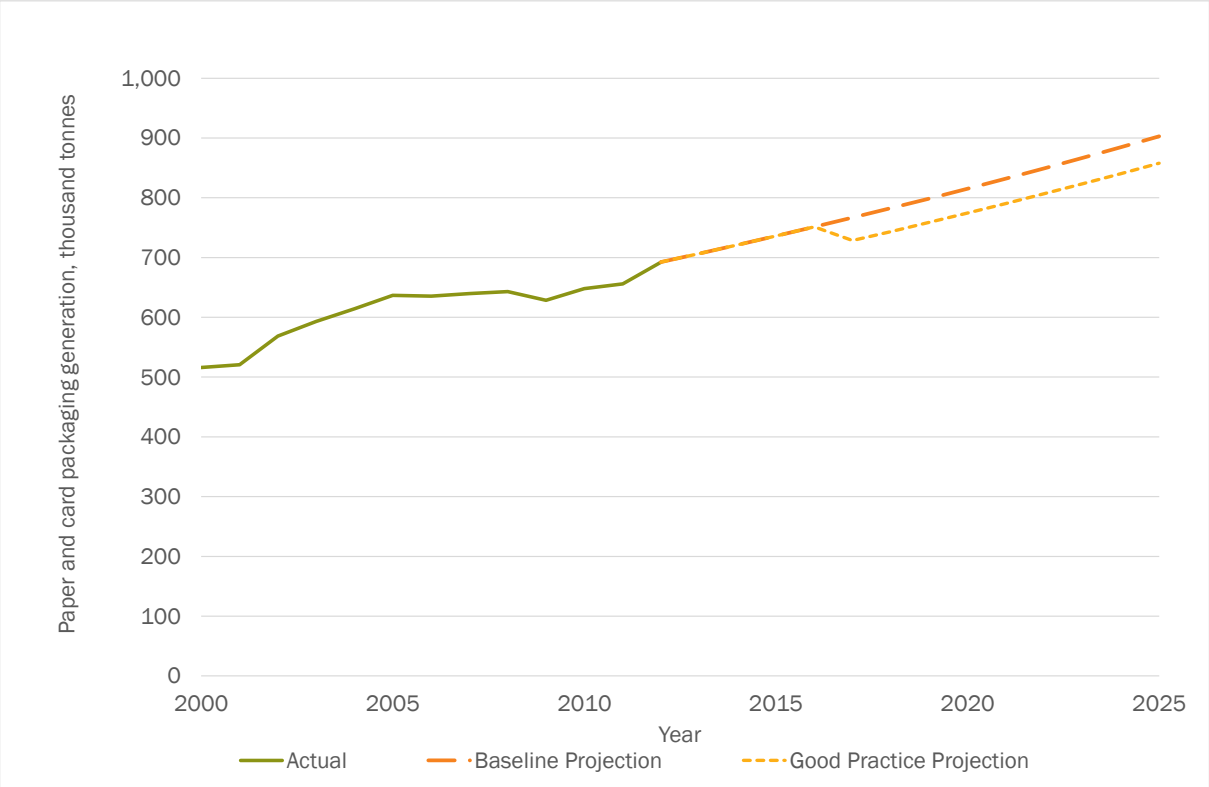

Figure 70: Change in Plastic Packaging Generation, thousand tonnes

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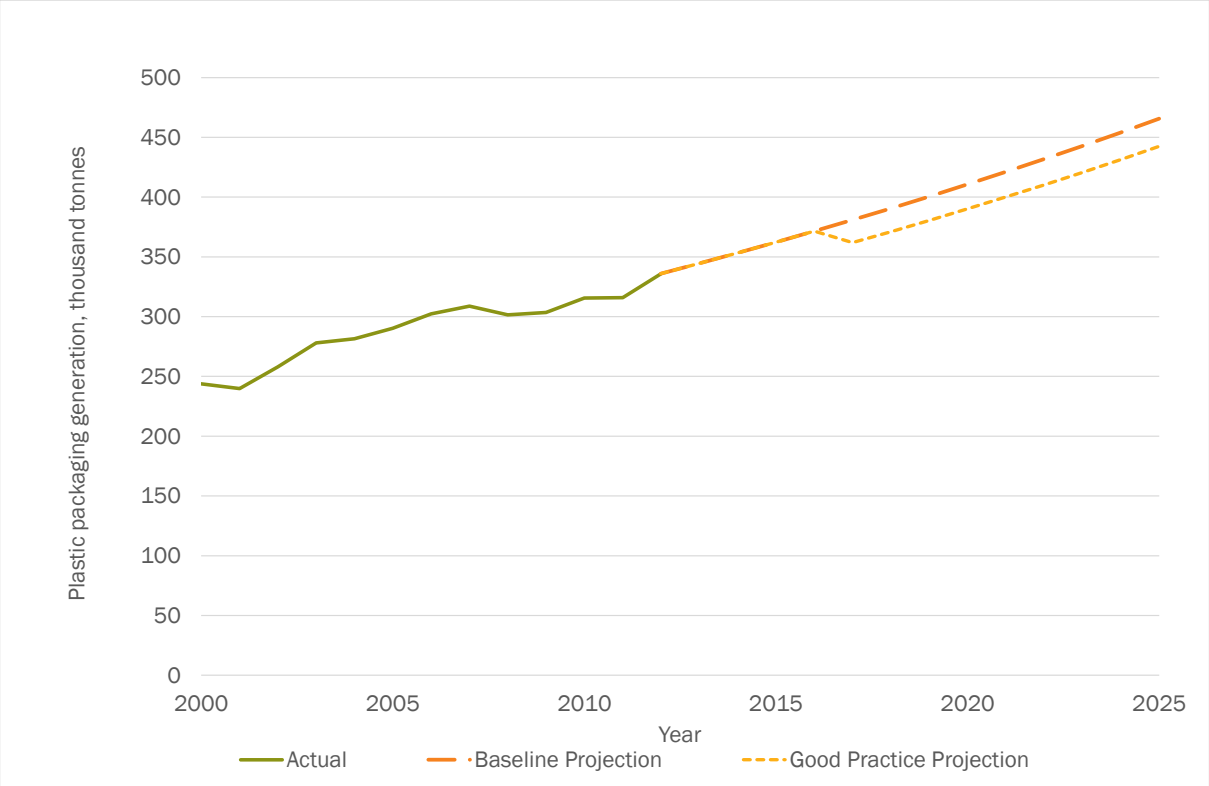


Figure 71: Change in Wood Packaging Generation, thousand tonnes

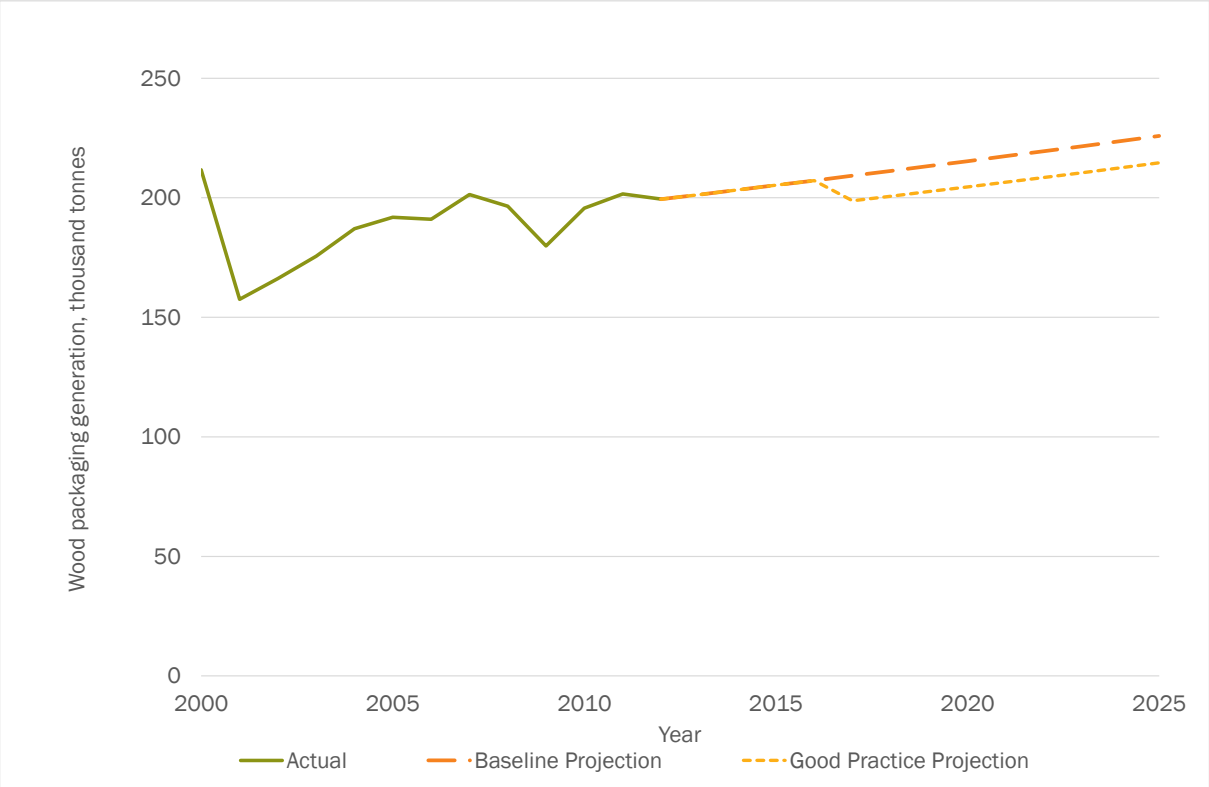


Figure 72: Change in Metal Packaging Generation, thousand tonnes

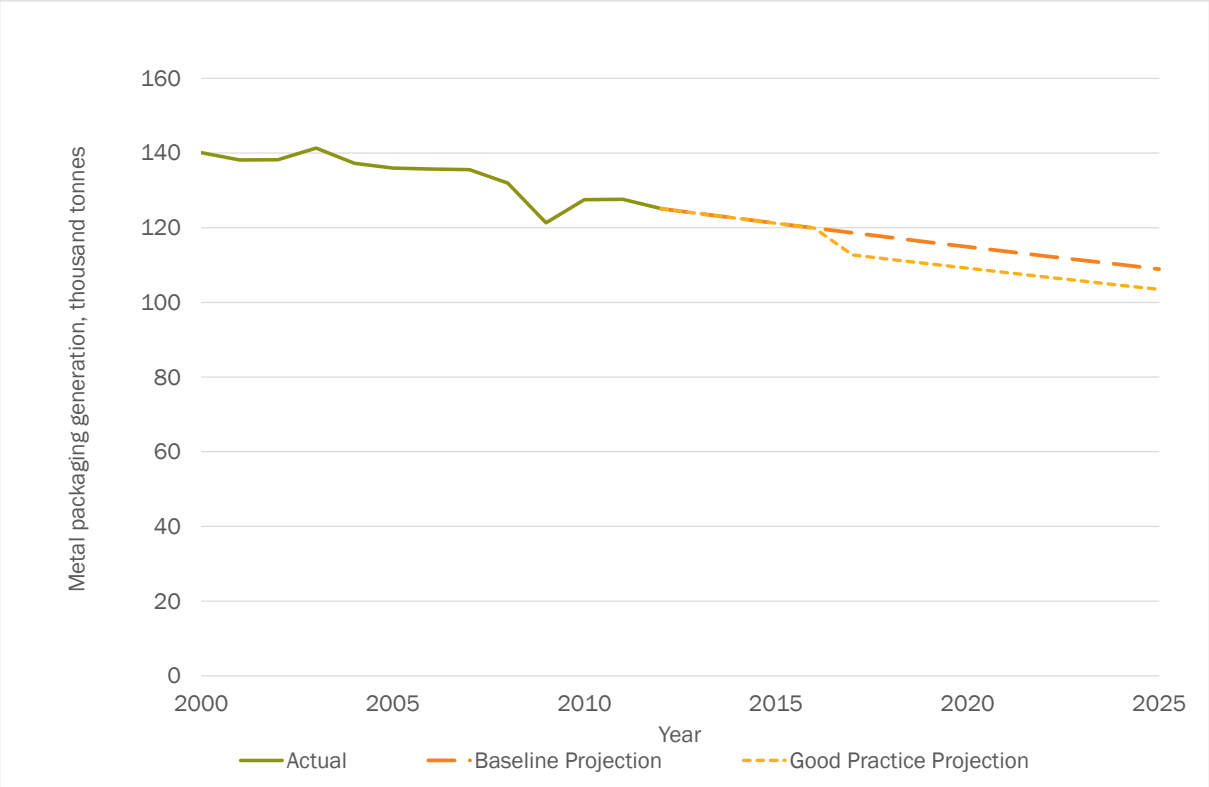


Figure 73: Change in Glass Packaging Generation, thousand tonnes

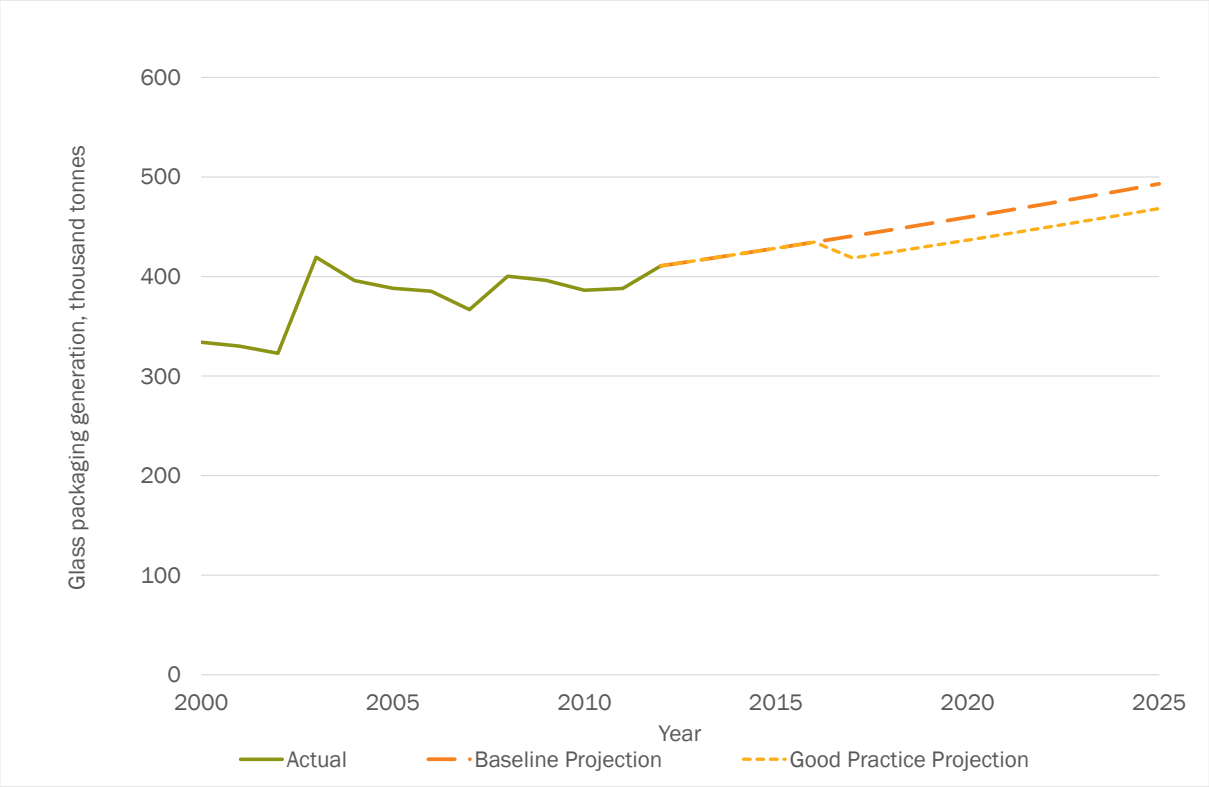
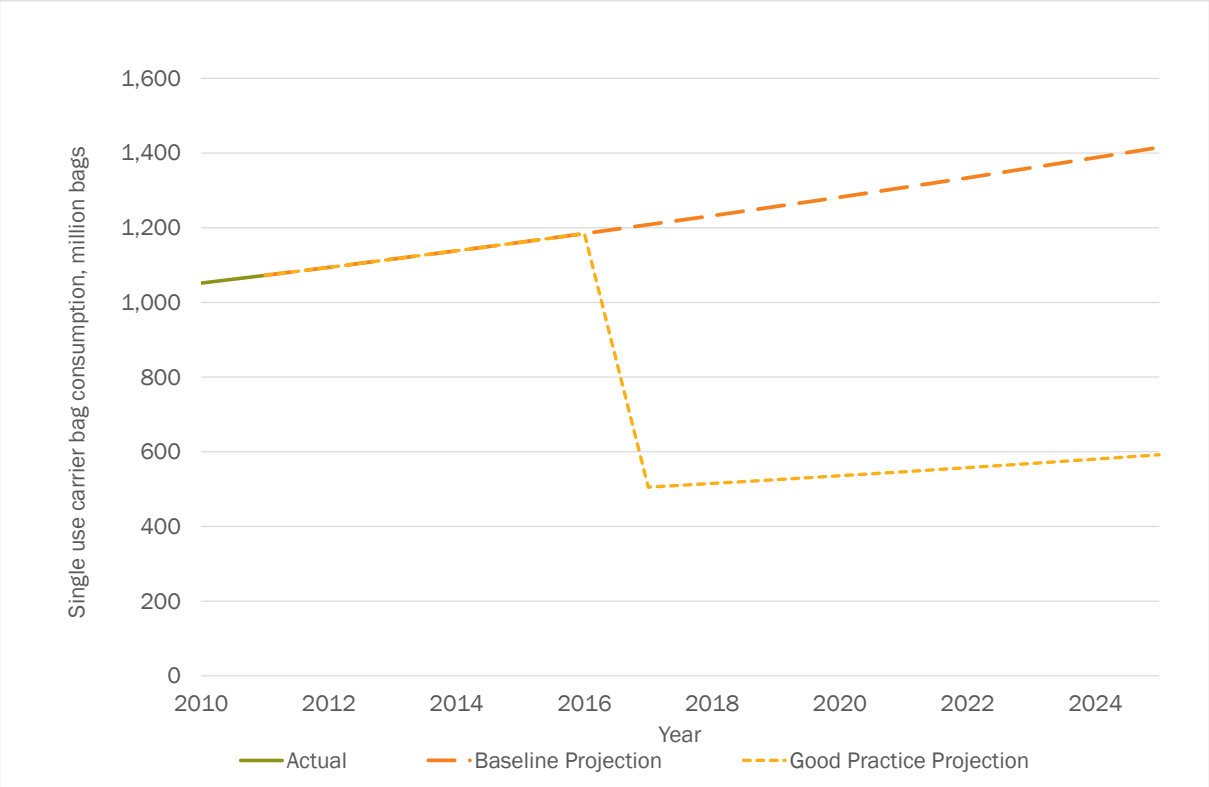


Figure 74: Change in Consumption of Single Use Carrier Bags, million bags



A.6.6 Full Revenue Outputs

Table 161: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	153	304	455	603	751	897	1,042	1,186	1,186	1,186
	C&I / Heating	0	0	186	368	546	546	546	546	546	546	546	546
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million EUR	*0*	*0*	*339*	*673*	*1,001*	*1,150*	*1,297*	*1,444*	*1,589*	*1,732*	*1,732*	*1,732*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.2%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	508	1,022	1,543	2,070	2,671	2,708	2,746	2,784	2,823	2,863
	Passenger Aviation Tax	0	0	451	901	925	948	972	996	1,020	1,045	1,069	1,094
	Freight Aviation Tax	0	0	1	1	1	1	1	2	2	2	2	2
	Sub-total Transport, million EUR	*0*	*0*	*960*	*1,925*	*2,469*	*3,020*	*3,644*	*3,706*	*3,768*	*3,831*	*3,894*	*3,959*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.5%*	*0.6%*	*0.7%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0	0

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	0	16	16	16	16	16	16	16	16	16	16
	Air Pollution Tax	0	23	43	60	75	86	80	77	75	73	71	68
	Water Abstraction Tax	0	141	277	407	531	650	635	636	636	636	636	636
	Waste Water Tax	0	15	30	43	41	41	41	41	41	41	41	41
	Pesticides Tax	0	0	84	164	160	160	160	161	161	161	161	161
	Aggregates Tax	0	0	256	229	202	176	150	149	148	147	146	146
	Packaging Tax	0	0	59	57	58	59	60	61	62	63	64	65
	Single Use Bag Tax	0	97	99	23	23	24	24	25	25	26	26	27
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	*0*	*276*	*863*	*999*	*1,106*	*1,212*	*1,167*	*1,165*	*1,164*	*1,163*	*1,162*	*1,161*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.1%*	*0.2%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*
	Total, million EUR	0	276	2,162	3,596	4,577	5,382	6,108	6,315	6,521	6,726	6,789	6,852

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.1%	0.5%	0.9%	1.1%	1.3%	1.4%	1.5%	1.5%	1.5%	1.5%	1.5%

A.7.0 Croatia: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

The following section outlines environmental taxes and charges in place in Croatia. Rates and revenues are given both in Croatian Kuna (HRK) and in Euros.[707]

A.7.1 Energy

- Excise duty on energy products ("Trošarina na energente i električnu energiju"):
  - This tax is paid on the use of mineral oil and other energy products. The revenue from this tax goes to the state.
  - Rates: see Table 162 for details of rates. Note that a number of special rates and reductions apply, for example, for households' usage of electricity and natural gas.
  - Revenue in 2012 was HRK 5.68 billion (€755 million), equivalent to 1.7% of GDP.[708]
  - Main exemptions:[709]

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[707] Currency conversions from HRK to € are calculated using exchange rates for the relevant year from the following source:

Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[708] See Table 2 in Ministry of Finance (Republic of Croatia) (2013) *Statistical Review: Ministry of Finance Monthly Statistical Review - Number 215*, August 2013, p. 4, http://www.mfin.hr/adminmax/docs/215%20AUGUST%202013.pdf.

[709] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Energy products used as fuel in air navigation, with the exception of private pleasure flights;
- Energy products used as fuel in international navigation with the exception of vessels for private purposes;
- Energy products used for further processing or the production of other energy products and electricity, except when used as an motor fuel for means of transport;
- Energy products used for purposes other than motor fuel or heating fuel; and
- Energy products used for cogeneration of heat and electricity.

Table 162: Details of Mineral Oil Taxes (Croatia, 2013/14)[710]

General tax base	Specific tax base	Tax rate	
		HRK	EUR
Petrol (per 1,000 litres)	Unleaded	3,460.00	456.71
	Leaded	4,100.00	541.18
Gas oil (per 1,000 litres)	Transport fuels / Motor fuels	2,660.00	351.11
	For use in agriculture, fishery and aquaculture	0.00	0.00
	Heating	423.00	55.83
Kerosene (per 1,000 litres)	Transport fuels / Motor fuels	2,660.00	351.11
	Heating	1,752.00	231.26
Heavy fuel oil (per 1,000 kg)	Heating	160.00	21.12
Liquid Petroleum Gas (per 1,000 kg)	Transport fuels / Motor fuels	100.00	13.20
	Heating	100.00	13.20
Natural Gas (per GJ)	Transport fuels / Industrial & Commercial Use	0.00	0.00
	Heating (Business use)	4.05	0.53
	Heating (Non-business use)[1]	8.10	1.07
Coal, Coke, Lignite (per GJ)	Heating (business or non-business)	2.30	0.30

[710] Unless otherwise noted, all rates are from European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Electricity (per MWh)	Business	3.75	0.49
	Non-business use[1]	7.50	0.99
Biofuels (per 1,000 litres)	All uses[2]	0.00	0.00

Notes:

[1] Households are exempt from paying this tax.

[2] A proportional discount is given on tax paid on any other fuel containing a percentage of biofuels, up to 5% (see: Tax Administration - Ministry of Finance (Republic of Croatia) (2013) Hrvatski Porezni Sustav (The Croatian Tax System), December 2013, www.porezna-uprava.hr/HR_publikacije/Prirucnici_brosure/PorezniSustav_2012.pdf)

A.7.2 Transport (excl. transport fuels)

- Registration:
  - Motor vehicles special tax ("Zakon o posebnom porezu na motorna vozila"):[711]
    - This is a one-off registration tax paid on all motor vehicles designed primarily for the transport of persons which are registered or imported into Croatia. This includes motorcycles, bicycles with additional engines, 'pick-up' vehicles and all-terrain vehicles.
    - This tax came into force on the date of Croatia's accession to the EU (1st July 2013) and, together with a new special tax on vessels (collected at a county level, see below), replaces the previous combined special tax on passenger cars, other motor vehicles, vessels and aircrafts.
    - For passenger cars and 'pick up' vehicles, the tax is calculated as a percentage of the sales price, with bands based on the sale price of the vehicle as well as its CO_2 emissions (see Table 163 for rates).
    - For motorcycles and all-terrain vehicles, the tax is calculated as a percentage of the sales price, with bands based on the volumetric size of the engine as well as its EURO emissions classification (see Table 164 for rates).
    - Exemptions apply for ambulances and vehicles used by people with disabilities. Fully electric vehicles are also exempt from the tax and for "plug-in" hybrid electric vehicles, the amount of tax to be paid is reduced by a percentage equal to the "all electric range" of the vehicle (in km).

[711] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=3222/1373445394&taxType=Other+indirect+tax

- The tax on camper vans is reduced by 85%.
- Revenues from this tax form part of the state's national budget.
- Revenue in 2012 from the special tax on passenger cars, other motor vehicles, vessels and aircrafts, which was replaced by the special tax on motor vehicles on 1st July 2013: was HRK 532 million (€71 million), equivalent to 0.16% of GDP.[712]
- Revenue from 1st January 2013 to 30 June 2013 from the special tax on passenger cars, other motor vehicles, vessels and aircrafts, which was replaced by the special tax on motor vehicles on 1st July 2013 was HRK 342 million (45.1 million), equivalent to 0.10% of GDP.[713]
- Revenue from the special tax on motor vehicles, from 1st July 2013 to 31st December 2013 was HRK 209 million (€27.6 million), equivalent to 0.06% of GDP.[714]

Table 163: Motor Vehicles Special Tax, Passenger Cars and Pick Up Vehicles (Croatia, 2013/2014)[715]

Basic Tax Rate			
General tax base	Specific tax base		Tax rate (percentage of sales price)
	HRK	EUR	
Sales price	0 – 100,000.00	0 – 13,199.58	1%
	100,000.01 – 150,000.00	13,199.58 – 19,799.37	2%
	150,000.01 – 200,000.00	19,799.37 – 26,399.16	4%
	200,000.01 – 250,000.00	26,399.16 – 32,998.94	6%
	250,000.01 – 300,000.00	32,998.95 – 39,598.73	7%
	300,000.01 – 350,000.00	39,598.73 – 46,198.52	8%
	350,000.01 – 400,000.00	46,198.52 – 52,798.31	9%

[712] See Table 2 in Ministry of Finance (Republic of Croatia) (2013) *Statistical Review: Ministry of Finance Monthly Statistical Review - Number 215*, August 2013, p. 4, http://www.mfin.hr/adminmax/docs/215%20AUGUST%202013.pdf.

[713] Personal correspondence with Ministry of Finance, Croatian Customs personal relations office, 13 January 2014.

[714] Personal correspondence with Ministry of Finance, Croatian Customs personal relations office, 13 January 2014.

[715] The exchange rate used is the 2013 average.
Sources for rates: European Commission (2013) *Taxes in Europe Database*, Accessed 13th January 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

	400,000.01 – 450,000.00	52,798.31 – 59,398.10	11%
	450,000.01 – 500,000.00	59,398.10 – 65,997.89	12%
	500,000.01 and above	65,997.89 and above	14%
Malus			
General tax base	**Specific tax base**	**Tax rate (percentage of sales price)**	
		Vehicles with diesel fuel	**Vehicles with petrol, LPG, natural gas and diesel fuel with emissions standard EURO VI**
CO_2 emissions	86 – 100	1.5%	
	91 – 100		1%
	101 – 110	2.5%	2%
	111 – 120	3.5%	3%
	121 – 130	7%	6%
	131 – 140	12%	10%
	141 – 160	16%	14%
	161 – 180	18%	16%
	181 – 200	20%	18%
	201 – 225	23%	21%
	226 – 250	27%	23%
	251 – 300	29%	27%
	301 and above	31%	29%

Table 164: Motor Vehicles Special Tax, Motorcycles and All-Terrain Vehicles (Croatia, 2013/2014)[716]

General tax base	Specific tax base	Tax rate (percentage of sales price)
Basic Tax Rate		
Engine capacity (ccm)	51 - 125	2.5%
	126 - 250	3%
	251 - 400	3.5%
	401 - 600	4%
	601 - 800	4.5%
	801 - 1000	5%
	1001 -	5.5%
Malus		
Exhaust emissions level	EURO III	5%
	EURO II	10%
	EURO I	15%

- Environmental charge on motor vehicles:
  - This is paid at the time of registration of the vehicle and revenues are passed to the Environmental Protection and Energy Efficiency Fund (EPEEF).[717]
  - The calculation of the charge is based on a formula: $PN = N_O \times k_K$, where PN is the total charge paid, N_O is the basic fee per vehicle (depending on the type of vehicle) and k_K is the corrective coefficient.[718]

[716] The exchange rate used is the 2013 average.
Sources for rates: European Commission (2013) *Taxes in Europe Database*, Accessed 13th January 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[717] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014 *(in press)*

[718] Fond za Zaštitu Okoliša i Energetsku Učinkovitost (Environmental Protection and Energy Efficiency Fund) (no date) *Posebna Naknada za Okoliš za Vozila na Motorni Pogon (Special Environmental Charge on Motor Vehicles)*, accessed 15 January 2014, http://www.fzoeu.hr/hrv/index.asp?s=naknade&p=vozila

- For all vehicles, $k_K = k_1 \times k_2 \times k_3$, where k_1 is based on the type of engine and fuel, k_2 is based on the engine capacity and k_3 is based on the age of the vehicle.
- N_0, the basic unit charge rate per vehicle, encompasses nine categories of vehicles and varies from HRK 30.00 (€3.96) for a moped and HRK 80.00 (€10.60) for a passenger car to HRK 480.00 (€63.36) for a HGV.
- Values of k_1 vary from 0.2 for vehicles with electric or alternative fuel engines to 2.0 for vehicles with two-stroke Otto engines.
- Values of k_2 vary from 0.8 for engine volumes of less than 50 ccm and 1.0 for alternative fuel or electric engines to 2.0 for engine volumes greater than 16,000 ccm.
- Values of k_3 vary from 0.90 for vehicles between 0 and 5 years old to 1.60 for vehicles more than 30 years old.[719]
- Revenue in 2012 was HRK 229 million (€30.4 million), equivalent to 0.07% of GDP.[720]

➢ Circulation:

- Tax on road motor vehicles ("Porez na cestovna motorna vozila"):[721]
  - The tax on road motor vehicles is an annual tax paid on passenger cars (up to 10 years old) and motorcycles.
  - The tax rate is calculated based on the engine power and the age of the vehicle (see Table 165 for details of the rates).
  - Exemptions apply for vehicles belonging to local authorities or other governmental organisations, vehicles related to healthcare and fire-fighting, taxis and other persons who are exempt from paying customs duty, VAT or turnover tax when purchasing the vehicle.
  - Revenues from this tax are collected by the regional authorities (county level).

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[719] Fond za Zaštitu Okoliša i Energetsku Učinkovitost (Environmental Protection and Energy Efficiency Fund) (no date) *Primjeri Izračuna Posebne Naknade za Okoliš na Vozila na Motorni Pogon (Examples of Calculating the Special Environmental Charge on Motor Vehicles)*, accessed 15 January 2014, http://www.fzoeu.hr/hrv/index.asp?s=naknade&p=primjerizracuna

[720] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press).*

[721] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

    - Revenue in 2011 (the latest year for which data is available) was HRK 250 million (€34 million), equivalent to 0.08% of GDP.[722] [723]
  - Tax on vessels ("Porez po tonaži broda"):[724]
    - This tax is an annual tax paid on vessels for private use.
    - The tax rate is based on the type of the vessel and size of the vessel. (See Table 166 for details of rates.)
    - Revenues are collected by regional authorities (county level).
    - Revenue: In 2012 the revenue was HRK 3.1 mil (€ 0.4 million).[725]
- Other:
  - Special tax on liability and comprehensive road vehicle insurance premiums ("Posebni porez na premije osiguranja od automobilske odgovornosti i premije kasko osiguranja cestovnih vozila"):[726]
    - This tax is collected on insurance premiums for motor vehicles and forms part of the national state tax revenue.
    - Rates for 2013/2014 are 15% of the premium for obligatory third party liability insurance + 10% of the premium for comprehensive insurance.
    - Revenue in 2012: HRK 521 billion (€69 million), equivalent to 0.16% of GDP.[727]

We understand that an annual charge on the usage of public roads also exists and generates more than HRK 1 billion.

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[722] See Table 4.1 in Ministry of Finance (Republic of Croatia) (2012) *Annual report of the Ministry of Finance for 2011*, 2012, p. 62, http://www.mfin.hr/adminmax/docs/Annual%20report%20of%20the%20Ministry%20of%20Finance%202011.pdf.

[723] The Ministry of Finance was approached to provide figures for 2012, but requests were refused.

[724] Tax Administration - Ministry of Finance (Republic of Croatia) (2013) *The Tax on Vessels*, accessed 13 January 2014, http://www.porezna-uprava.hr/en/EN_porezni_sustav/Stranice/tax_vessels.aspx

[725] Izvještaj o vlastitim prihodima i primicima državnog, županijskih i gradskih/općinskih proračuna u 2012. g.

[726] Tax Administration - Ministry of Finance (Republic of Croatia) (2012) *The Croatian Tax System*, April 2012, http://www.porezna-uprava.hr/en/EN_publikacije/Documents/HPS_2012_ENG.pdf

[727] Adapted from Table 3 in Hrvatski Ured za Osiguranje (Croatian Insurance Office) (2013) *Izvješće o Tržištu Obveznih Osiguranja u Prometu s Posebnim Osvrtom na Osiguranje od Automobilske Odgovornosti (Report on Obligatory Insurance in Traffic Market with Special Focus on Insurance of Car Liability)*, April 2013, p. 15, https://www.huo.hr/download_file.php?file=huo-izvjesce-ao2012.pdf&docID=496&seID=564e0d5e218f666553fecd2f2fa712b4

Table 165: Tax on Road Motor Vehicles (Croatia, 2013/2014)[728]

General tax base	Specific tax base	Tax rate (based on age of vehicle)							
		Up to 2 years old		2 – 5 years old		5 – 10 years old		Over 10 years old	
		HRK	EUR	HRK	EUR	HRK	EUR	HRK	EUR
Passenger Cars									
Engine power (kW)	0 – 55	300.00	39.60	250.00	33.00	200.00	26.40	0	0
	55 – 70	400.00	52.80	350.00	46.20	250.00	33.00	0	0
	70 – 100	600.00	79.20	500.00	66.00	400.00	52.80	0	0
	100 – 130	900.00	118.80	700.00	92.40	600.00	79.20	0	0
	Above 130	1,500.00	197.99	1,200.00	158.39	1,000.00	132.00	0	0
Motorcycles									
Engine power (kW)	0 – 20	100.00	13.20	80.00	10.56	50.00	6.60	0	0
	20 – 50	200.00	26.40	150.00	19.80	100.00	13.20	50.00	6.60

[728] The exchange rate used is the 2013 average.
Sources for rates: Tax Administration - Ministry of Finance (Republic of Croatia) (2013) *The Tax on Road Motor Vehicles*, accessed 13 January 2014, http://www.porezna-uprava.hr/en/EN_porezni_sustav/Stranice/tax_road_vechiles.aspx

General tax base	Specific tax base	Tax rate (based on age of vehicle)							
		Up to 2 years old		2 – 5 years old		5 – 10 years old		Over 10 years old	
		HRK	EUR	HRK	EUR	HRK	EUR	HRK	EUR
	50 – 80	500.00	66.00	400.00	52.80	300.00	39.60	200.00	26.40
	Above 80	1,200.00	158.39	1,000.00	132.00	800.00	105.60	600.00	79.20

Table 166: Tax on Vessels (Croatia, 2013/2014)[729]

General tax base	Specific tax base	Tax rate (based of length of vessel)							
		5 – 7 metres		7 – 10 metres		10 – 12 metres		Over 12 metres	
		HRK	EUR	HRK	EUR	HRK	EUR	HRK	EUR
Vessel without a cabin									
Engine power (kW)	0 – 30	0.00	0.00	100.00	13.20	200.00	26.40	200.00	26.40
	30 – 100	200.00	26.40	300.00	39.60	450.00	59.40	450.00	59.40
	Above 100	400.00	52.80	500.00	66.00	600.00	79.20	600.00	79.20

[729] The exchange rate used is the 2013 average.
Sources for rates: Tax Administration - Ministry of Finance (Republic of Croatia) (2013) *The Tax on Vessels*, accessed 13 January 2014, http://www.porezna-uprava.hr/en/EN_porezni_sustav/Stranice/tax_vessels.aspx

General tax base	Specific tax base	Tax rate (based of length of vessel)							
		5 – 7 metres		7 – 10 metres		10 – 12 metres		Over 12 metres	
		HRK	EUR	HRK	EUR	HRK	EUR	HRK	EUR
Vessel with a cabin, motor powered									
Engine power (kW)	0 – 30	0.00	0.00	200.00	26.40	300.00	39.60	400.00	52.80
	30 – 100	200.00	26.40	400.00	52.80	500.00	66.00	1,000.00	132.00
	100 – 500	300.00	39.60	500.00	66.00	1,000.00	132.00	3,000.00	395.99
	Above 500	0.00	0.00	2,500.00	329.99	3,500.00	461.99	5,000.00	659.98
Vessel with a cabin, powered by sails									
Engine power (kW)	0 – 10	0.00	0.00	200.00	26.40	300.00	39.60	400.00	52.80
	10 – 25	300.00	39.60	600.00	79.20	800.00	105.60	1,500.00	197.99
	25 – 50	400.00	52.80	1,000.00	132.00	2,000.00	263.99	3,000.00	395.99
	Above 50	500.00	66.00	2,000.00	263.99	3,000.00	395.99	4,000.00	527.98

A.7.3 Pollution and Resources

All pollution and resource charges in Croatia are paid to the Environmental Protection and Energy Efficiency Fund (EPEEF). These charges include:

- Air pollution charges (2013):
  - Pollution charges are paid based on emissions of SO_2, NO_2 and CO_2. These are set according to an equation which is based on the tonnage of emissions (charged at a set rate) multiplied by a number of coefficients related to the activity and total emissions.
  - CO_2 charges are not paid on emissions from the combustion of biomass fuels, organic waste, and the incineration of sewage sludge.[730]
  - The basic equation for charges on emissions is $N = N_1 \times E \times k_K$, where N is the total charge paid annually, N_1 is the basic fee per tonne of emissions, E is the total amount of annual emissions and k_K is the corrective coefficient.
  - For SO_2 and NO_2, N_1 is HRK 310 (€40.92[731]) per tonne and $k_K = k_1 \times k_2 \times k_3$, where k_1 is based on the total annual emissions, k_2 is based on the type of process used and k_3 is based on whether or not the process complies with the regulations on maximum limits on pollution from stationary sources:
    - Values of k_1: For annual emissions higher than 500 tonnes per year: 1.00; for annual emissions between 100 and 500 tonnes per year (SO_2) or between 50 and 500 tonnes per year (NO_2): 0.83; for annual emissions between 0.1 and 100 tonnes per year (SO_2) or between 0.05 and 50 tonnes per year (NO_2): 0.67;
    - Values of k_2: For fuel combustion processes: 1.0; for technological processes: 0.5; and
    - Values of k_3: For processes complying with the regulations on maximum limits on pollution from stationary sources: 0.8; for non-compliant processes: 1.0.
  - For CO_2, N_1 is HRK 14 (€1.85) per tonne from 2008.[732] The rate was supposed to have increased to HRK 18 (€2.38) in 2009, but the

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[730] Official Gazette 073/2007 (2007) *Ordinance on Charge Units, Corrective Coefficients and Close Criteria for Calculation of Charge on Emissions of Carbon Dioxide in the Environment*, Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/298715.html

[731] Conversion rate used for 2013.

[732] Official Gazette 073/2007 (2007) *Ordinance on Charge Units, Corrective Coefficients and Close Criteria for Calculation of Charge on Emissions of Carbon Dioxide in the Environment*, Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/298715.html

regulations were amended in 2009 to remove this increase.[733] Amendments in 2009 also removed a higher tax rate for companies exceeding their CO_2 emissions quota. Similar to SO_2 and NO_2, the corrective coefficient k_K is made up of further coefficients. For CO_2, $k_K = k_1 \times k_2 \times k_3 \times k_4$, where k_1 is based on the total annual emissions, k_2 is based on the emissions source, k_3 contains an incentive to invest in projects related to energy efficiency and renewable energy, and k_4 contains an incentive to invest in projects related to carbon reductions:

- Values of k_1: For annual emissions higher than 500,000 tonnes per year: 0.67; for annual emissions between 100,000 and 500,000 tonnes per year: 0.75; for annual emissions between 50,000 and 100,000 tonnes per year: 0.85; and for annual emissions between 30 and 50,000 tonnes per year: 1.00.
- Values of k_2: For combustion of solid and liquid fossil fuels: 1.00; for combustion of gaseous fossil fuels: 0.70; for emissions from non-energy related industrial processes: 0.40; and for emissions from the incineration or co-incineration of waste of fossil fuel origin: 0.20.
- Values of k_3: This relates to the investment in energy efficiency, renewable energy and other measures to reduce emissions and the value is based on the total amount invested. For investments up to HRK 300,000 (€40,000): 1.0; for investments between HRK 300,000 (€40,000) and HRK 1 million (€130,000): 0.9; for investments between HRK 1 million (€130,000) and HRK 10 million (€1.3 million): 0.8; for investments between HRK 10 million (€1.3 million) and HRK 50 million (€6.6 million): 0.7; and for investments greater than HRK 50 million (€6.6 million): 0.5.
- Values of k_4: this relates to preparation of the emission reduction programmes by the source installation. The k_4 value is set at 0.78 for companies which prepare and implement a reduction programme previously approved by the Fund for Environmental Protection and Energy Efficiency.

- Revenue from SO_2 emissions in 2012: HRK 2.6 million (€350,000), equivalent to 0.001% of GDP.[734]

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[733] Official Gazette 048/2009 (2009) O*rdinance on Amendments of Ordinance on Charge Units, Corrective Coefficients and Close Criteria for Calculation of Charge on Emissions of Carbon Dioxide in the Environment*, Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/2009_04_48_1069.html

[734] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 (*in press)*

- Revenue from NO_2 emissions in 2012: HRK 3.6 million (€470,000), equivalent to 0.001% of GDP.[735]
- Revenue from CO_2 emissions in 2012: HRK 65 million (€8.7 million), equivalent to 0.02% of GDP.[736]

➢ Waste-related charges:[737]

- Industrial waste sent to landfill: HRK 12 /tonne (€1.58 /tonne). Revenue in 2012: HRK 2.8 million (€370 thousand), equivalent to 0.001% of GDP.[738]
- A number of other charges exist to disincentivise import or production of environmentally harmful products. These are related to producer responsibility requirements.
- Waste tyres, paid by producers or importers of tyres. Imported or produced tyres: HRK 1,500 (€198) per tonne. For tyres that are an integral part of a vehicle which has been imported, the following charges apply:[739]
    - Passenger cars: HRK 10 (€1.32) per tyre.
    - Professional vehicles up to 3.5 tonnes and tractors: HRK 15 (€1.98) per tyre.
    - Trucks and buses: HRK 85 (€11) per tyre.
    - Construction vehicles: HRK 250 (€33) per tyre.
    - Airplanes: HRK 250 (€33) per tyre.
    - Revenue in 2012: HRK 29 million (€3.9 million), equivalent to 0.009% of GDP.[740]
- End of Life Vehicles (ELVs), paid by importers or producers of vehicles: HRK 0.85 (€0.11) per kg:[741]

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[735] Ibid.

[736] Ibid.

[737] Official Gazette 071/2004 (2004) *Ordinance on Units Charges, Corrective Coefficients and Detailed Criteria for Calculation of the Charge on Waste Which is Harmful to the Environment*, Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/312110.html

[738] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

[739] Official Gazette 040/2006 (2006) *Ordinance on waste tyre management*, Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/126724.html

[740] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

[741] Official Gazette 136/06 (2006) *Ordinance on the management of end-of-life vehicles,* Accessed 13th January 2013,http://narodne-novine.nn.hr/clanci/sluzbeni/128820.html

    - Revenue in 2012: HRK 39 million (€5.2 million), equivalent to 0.012% of GDP.[742]
  - Waste electrical and electronic equipment (WEEE), paid by producers and importers of WEEE: HRK 2.25 (€0.30) per kg: [743]
    - Revenue in 2012: HRK 107 million (€14 million), equivalent to 0.032% of GDP.[744]
  - Batteries, paid by producers and importers of batteries:[745]
    - Starters: HRK 0.45 (€0.06) per kg.
    - Portable batteries and accumulators: HRK 8.40 (€1.11) per kg.
    - Industrial batteries and accumulators: HRK 0.70 (€0.09) per kg.
    - Revenue in 2012: HRK 7.6 million (€1.0 million), equivalent to 0.002% of GDP.[746]
  - Lubricating oils, paid by producers or importers: HRK 1 (€0.13) per litre.[747]
    - Revenue in 2012: HRK 41 million (€5.5 million), equivalent to 0.013% of GDP.[748]
- Packaging-related charges:

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[742] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

[743] Official Gazette 074/2007 (2007), *Ordinance on the management of waste electrical and electronic appliances and equipment,* Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/298762.html

[744] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

[745] Official Gazette 133/2006 (2006), *Ordinance on waste batteries and accumulators management,* http://narodne-novine.nn.hr/clanci/sluzbeni/128770.html with Official Gazette 156/2009 (2009), *Ordinance on Amendments to the Ordinance on waste batteries and accumulators management,* http://narodne-novine.nn.hr/clanci/sluzbeni/2009_12_156_3894.html Both accessed 13th January 2013,

[746] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

[747] Official Gazette 124/2006 (2006), *Ordinance on management of waste oils,* Accessed 13th January 2013, www.nn.hr/clanci/sluzbeno/2006/2762.htm

[748] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

- There are three types of charges paid by producers or importers of packaging materials:[749]
    - Disposal fee:
      paid according to the type and amount of packaging material (e.g. 53 €/t for PET and Al cans, 49 €/t for paper/cardboard, 20 €/t for glass, textile and wood, 98 €/t for plastic (not for drinks) etc.), and for drinks in non-returnable packaging, according to the unit of product (1.3 euro cents/0,10 HRK per unit).
    - Returnable fee
      a fee only for single-use (non-returnable) packaging for drinks of 6,5 euro cents/unit for all glass, PET, Al, Fe and tin packaging whose volume is greater than 0.20 l. Consumers (citizens) who return the packaging to the stores have the right to receive the same amount for each returned packaging unit. To encourage the collection of single-use packaging, some sellers (retailers) are required to receive such packaging from customers and because of this they are entitled to compensation from the Fund in the amount of 2 euro cents per packaging unit received.
    - Stimulative fee
      a fee only for packaging of drinks, with the purpose of encouraging the use of multiple-use returnable packaging. This fee shall be paid per unit of sales packaging for registered packaging placed on the market according to the type and size of packaging for drinks and shall be paid until the annual National Target for the share of returnable packaging is met, for a certain product for a certain year (e.g. 4 euro cents/unit for glass or PET, for which the volume is greater than 1,5 l; circa 3 euro cents/unit if volume is 0.51-1.5 L etc.).

  The fees are used by the Environmental Protection and Energy Efficiency Fund to reimburse stores for their role in the take back of drinks packaging, for handling the returnable fee, financing separate collection and recovery/recycling of packaging waste and to support improved packaging waste management.

    - Disposal charges for materials that can only be disposed of.

[749] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014 *(in press)*

    - Return charges for materials aimed at multi-use.
    - Incentive charges paid by producers of beverage containers who do not use returnable packaging.
- Charges are paid when more than the following amounts are put on the market per year: [750]
    - 800 kg glass;
    - 300 kg paper, cardboard;
    - 100 kg metals;
    - 100 kg plastics;
    - 100 kg wood; or
    - 100 kg other packaging material.
- Disposal charges are the following:[751]
    - PET: HRK 410 (€54) per tonne;
    - Aluminium cans: HRK 410 (€54) per tonne;
    - Iron cans: HRK 225 (€30) per tonne;
    - Paper, cardboard: HRK 375 (€50) per tonne;
    - Multi-layered packaging with dominant paper cardboard component:
        - For beverages: HRK 410 (€54) per tonne;
        - For other purposes: HRK 750 (€99) per tonne;
    - Plastic bags: HRK 1,500 (€198) per tonne;
    - Wood: HRK 150 (€20) per tonne;
    - Glass: HRK 150 (€20) per tonne;
    - Textile: HRK 150 (€20) per tonne; and
    - Other polymer materials: HRK 750 (€99) per tonne.
- Revenue in 2012: HRK 478 million (€64 million), equivalent to 0.14% of GDP.[752]

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[750] Official Gazette 074/2007 (2007), *Ordinance on Packaging and Packaging Waste,* Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/289416.html

[751] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014 *(in press)*

[752] See Table 5.12 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

Water charges form the basis of the revenue of the Government agency Croatian Waters, which is responsible for managing water in Croatia, including preparing water management strategies, plans and programmes.[753]

- Water protection fee:
  - This fee is paid by all who discharge waste water, whether a household or a business, as well as by producers and importers of mineral fertilisers.
  - Rate for mineral fertilisers (2012): HRK 1 (€0.13) per tonne and amended in 2013: HRK 3.7 (€0.49) tonne of nitrogen;[754]
  - Rate for 'plant protection chemicals': This was HRK 0.20 (€0.027) per kg in 2012 and was abolished in 2013.[755]
  - Fees for water discharge are based on the amount of water supplied and are set at HRK 1.35 (€0.18) per m^3 (2013). Discharges of cooling waters are charged at HRK 0.00135 (€0.0002) per m^3.[756]
    - Discharge fees are modified by three coefficients that are dependent on the composition of waste water, the type or amount of treatment it has received as well as excess water discharging.[757]
  - Revenue in 2012: HRK 219 million (€29 million), equivalent to 0.066% of GDP.[758]
- Water usage charge:
  - A water abstraction charge is levied on all who extract water, whether from surface waters or groundwater.

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[753] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 126 *(in press)*

[754] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 81-82 *(in press)*

[755] Official Gazette 082/2010 (2010), *Ordinance on Water Protection Charges,* Accessed 13th January 2013, http://narodne-novine.nn.hr/clanci/sluzbeni/2010_07_82_2334.html with amendments 151/2013 (http://narodne-novine.nn.hr/clanci/sluzbeni/2013_12_151_3185.html)

[756] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 81-82 *(in press)*

[757] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 81-82 *(in press)*

[758] See Table 5.13 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

- Rates for abstraction from surface waters (2013):[759]
  - Water of "very good quality": HRK 1.35 (€0.18) per m^3;
  - Water of "good quality": HRK 0.72 (€0.10) per m^3;
  - Water of "average quality": HRK 0.56 (€0.07) per m^3; and
  - Water of "bad and very bad quality": HRK 0.32 (€0.04) per m^3.
- Rates for abstraction from groundwater (2013):[760]
  - Water of "good quality": HRK 1.35 (€0.18) per m^3;
  - Water of "bad quality": HRK 0.32 (€0.04) per m^3; and
  - Thermal and mineral groundwater: HRK 1.60 (€0.21) per m^3.
- Specific fees are also charged for some uses of water: [761]
  - For production of electricity above 5MW the fee is 7.5% per kWh produced;
  - For production of electricity below 5MW the fee is 5% per kWh produced;
  - The fee for using water for other industrial purposes (using water to generate power besides electricity) is HRK 2 (€0.26) per year per kW of installed power;
  - The fee for using waters for cooling and heating residential and business buildings, excluding mineral and thermal waters, is HRK 0.10 (€0.01) per m^3; and
  - The fee for using the water for irrigation is HRK 500 (€66) per hectare of irrigated surface if the usage is not measured.
- Revenue in 2012: HRK 285 million (€38 million), equivalent 0.086% of GDP.[762]

A.7.4 Environmentally Harmful Subsidies

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 173.

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[759] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 89 *(in press)*

[760] United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 89 *(in press)*

[761] Official Gazette 082/2010 (2010), *Ordinance on Water Usage Charges,* Accessed 13th January 2013, narodne-novine.nn.hr/clanci/sluzbeni/2010_07_82_2335.html

[762] See Table 5.13 in United Nations Economic Commission for Europe (2014) *Environmental Performance Reviews: Croatia*, 2014, p. 96 *(in press)*

Table 167: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (HRK million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for gas oil used in agriculture, horticulture, pisciculture and forestry	TAXUD	Gas Oil - Other Sectors - Agricultural/Forestry	149	1000t	179,518	1000l	351.00	0	468.7
Excise tax exemption for household usage of natural gas	TAXUD	Natural Gas - Other Sectors - Household	25,319	TJ (GCV)	25,319,000	GJ	1.07	0	201.5
Excise tax exemption for household usage of electricity	TAXUD	Electrical Energy - Other Sectors - Household	6,523	GWh	6,523,000	MWh	0.99	0	48.0

Sources: Source: Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

A.7.5 Change in Tax Bases

Table 168: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	1,506	1,473	-33
Petrol	million litres	620	620	0
Kerosene	million litres	101	101	0
LPG	thousand tonnes	112	101	-11
Heavy Fuel Oil	thousand tonnes	60	59	-1
Natural Gas	TJ (GCV)	41,086	40,506	-581
Coal	thousand tonnes	193	175	-17
Electricity	GWh	11,747	11,735	-12

Figure 75: Change in Internal Passenger Flights, flights per year

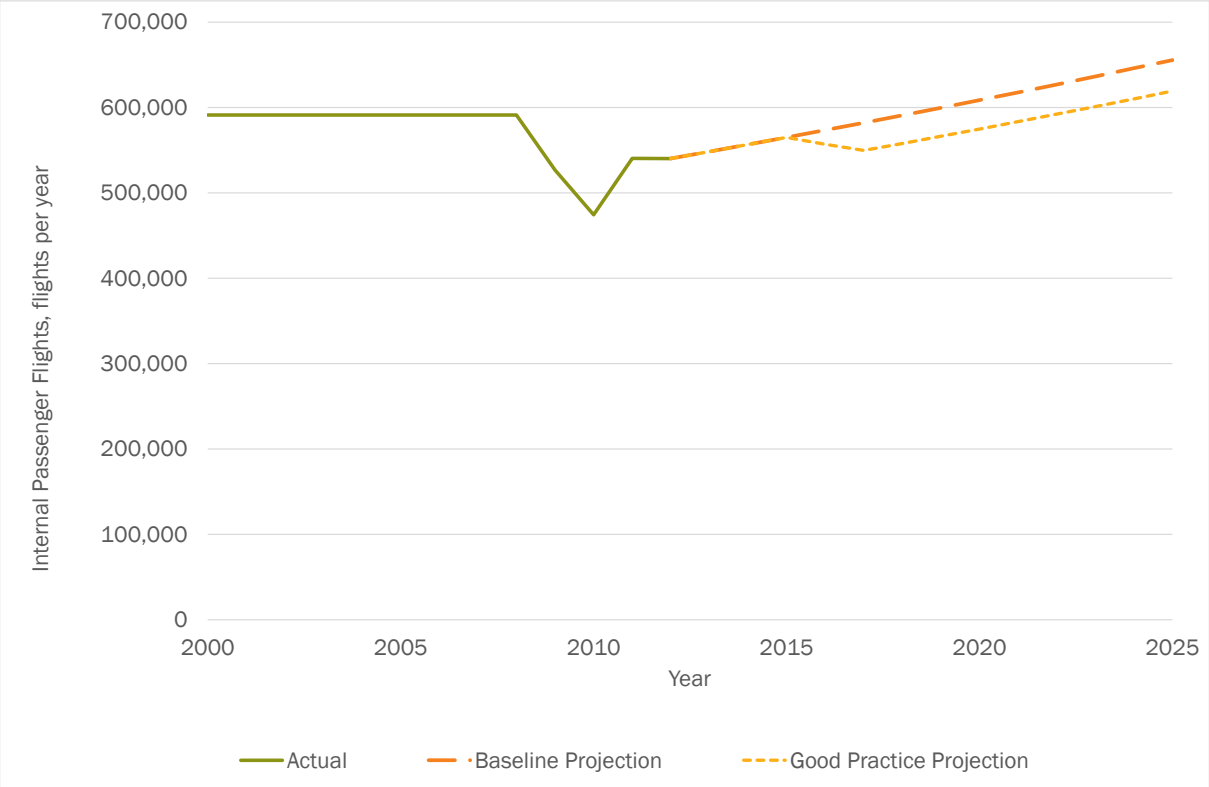


Figure 76: Change in Intra-EU Passenger Flights, flights per year

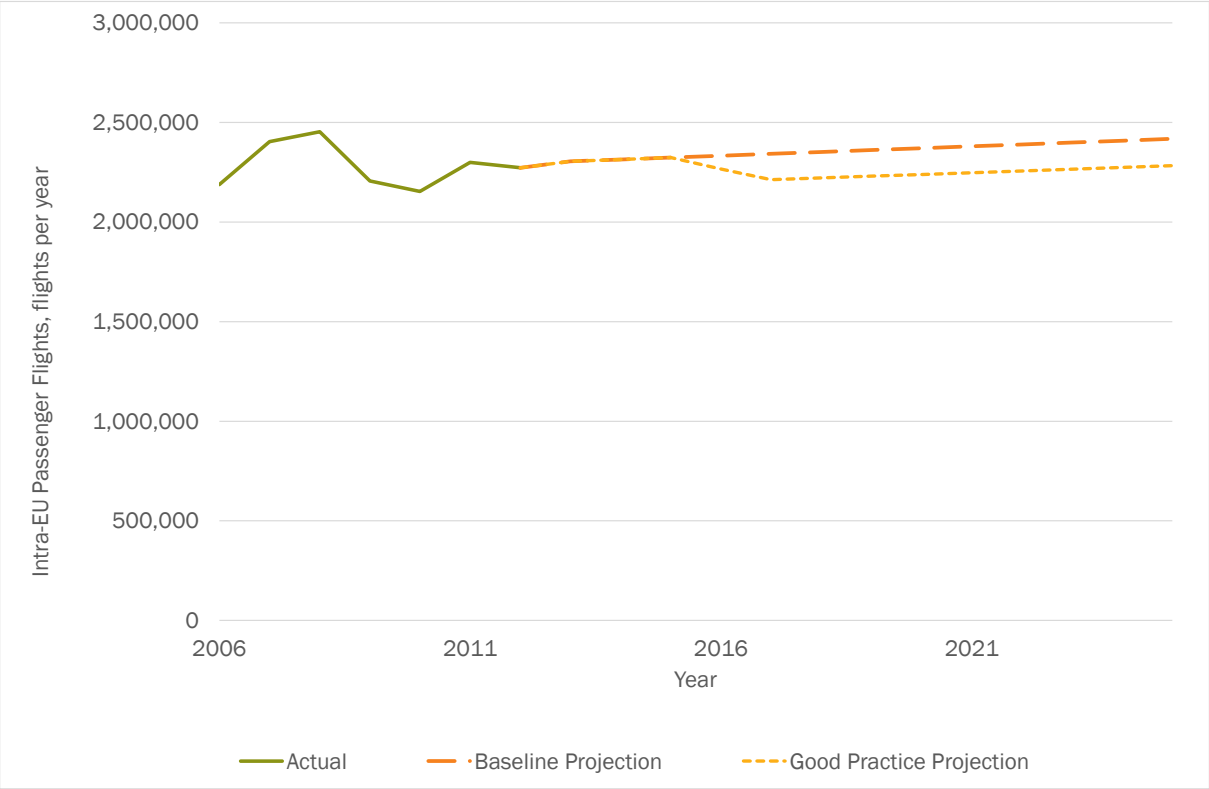


Figure 77: Change in Extra-EU Passenger Flights, flights per year

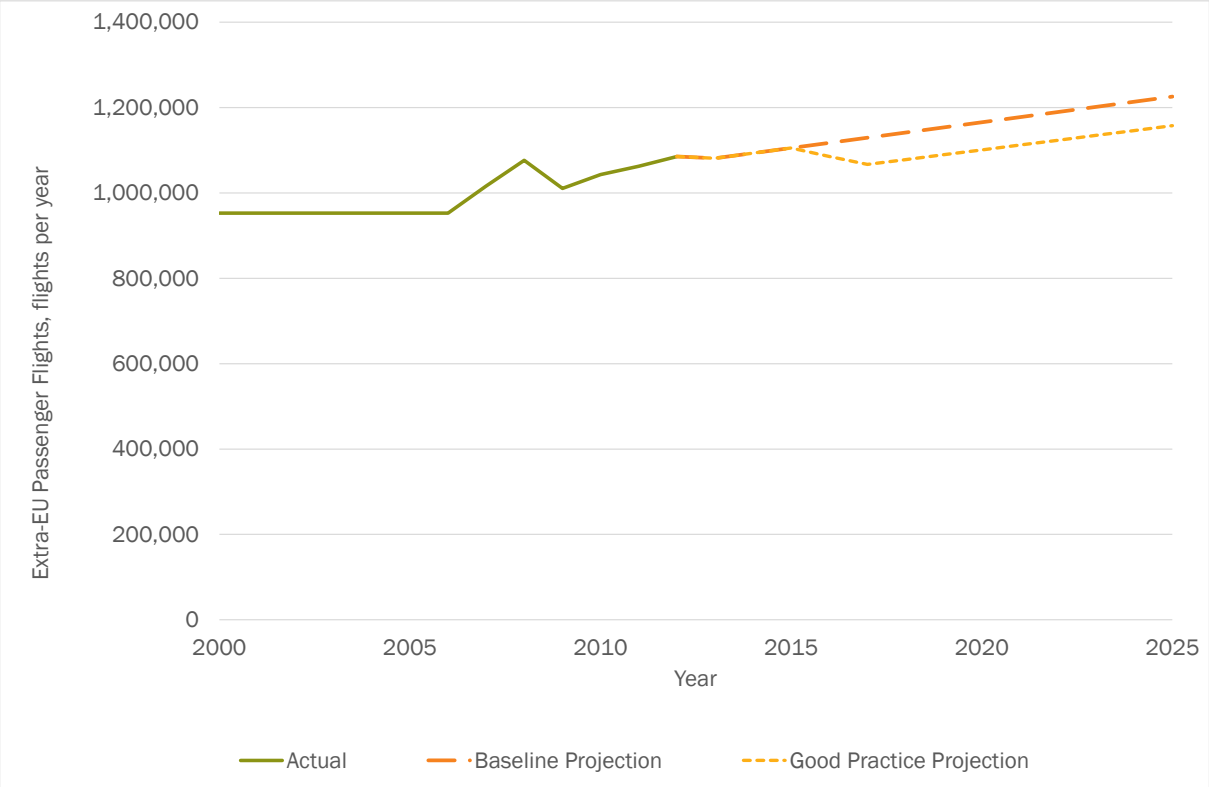


Figure 78: Change in Internal Air-freight, tonnes

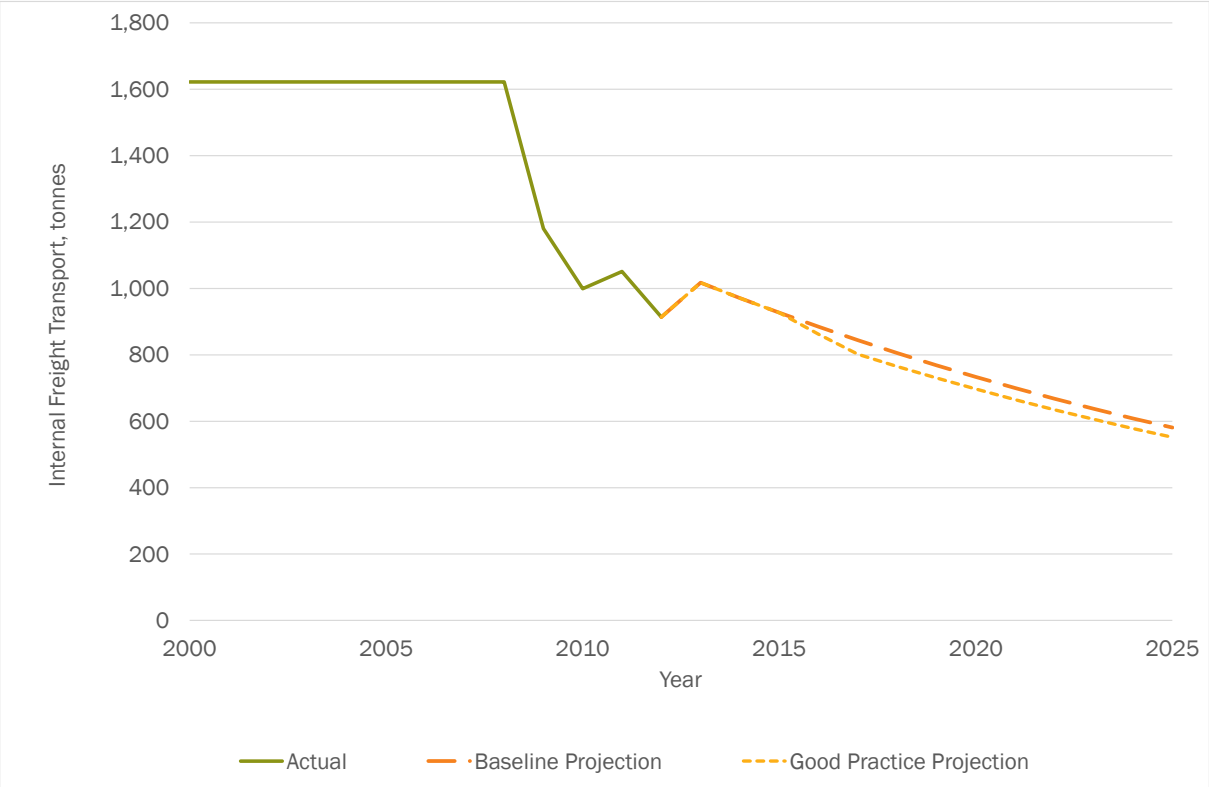


Figure 79: Change in Intra-EU Air-freight, tonnes

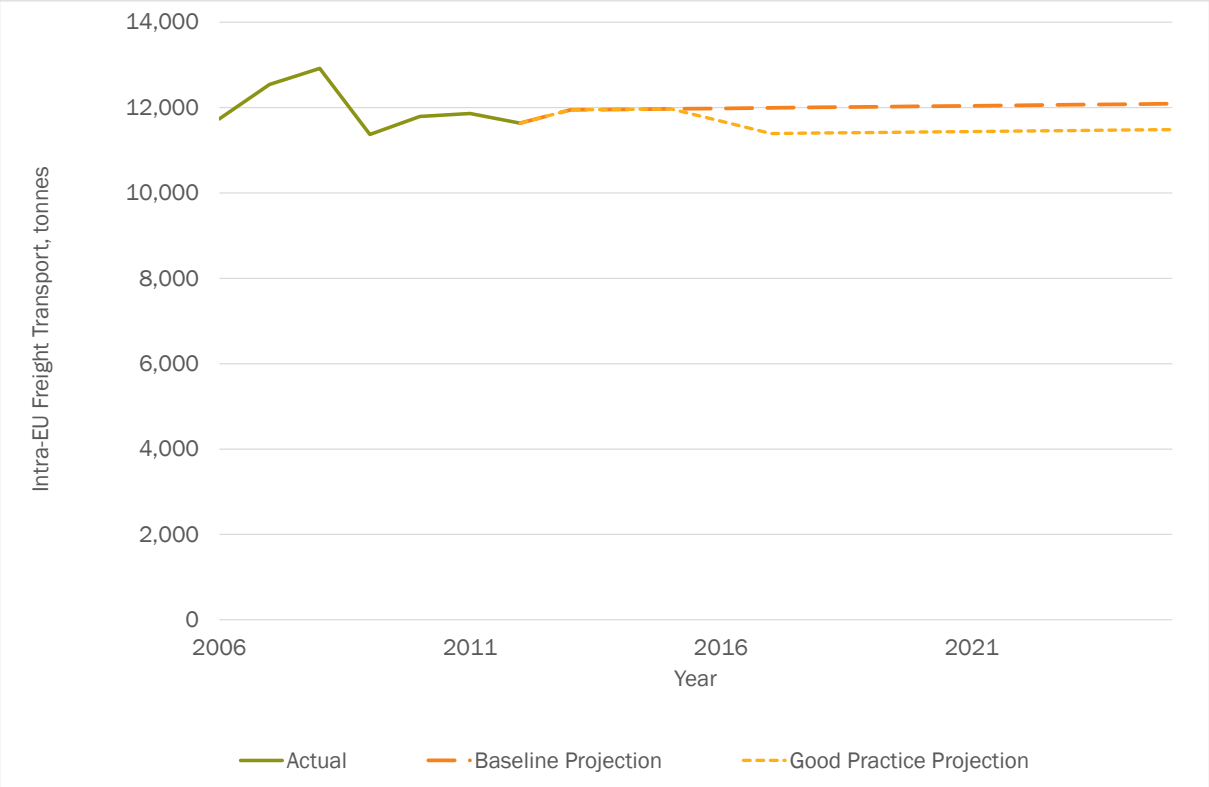


Figure 80: Change in Extra-EU Air-freight, tonnes

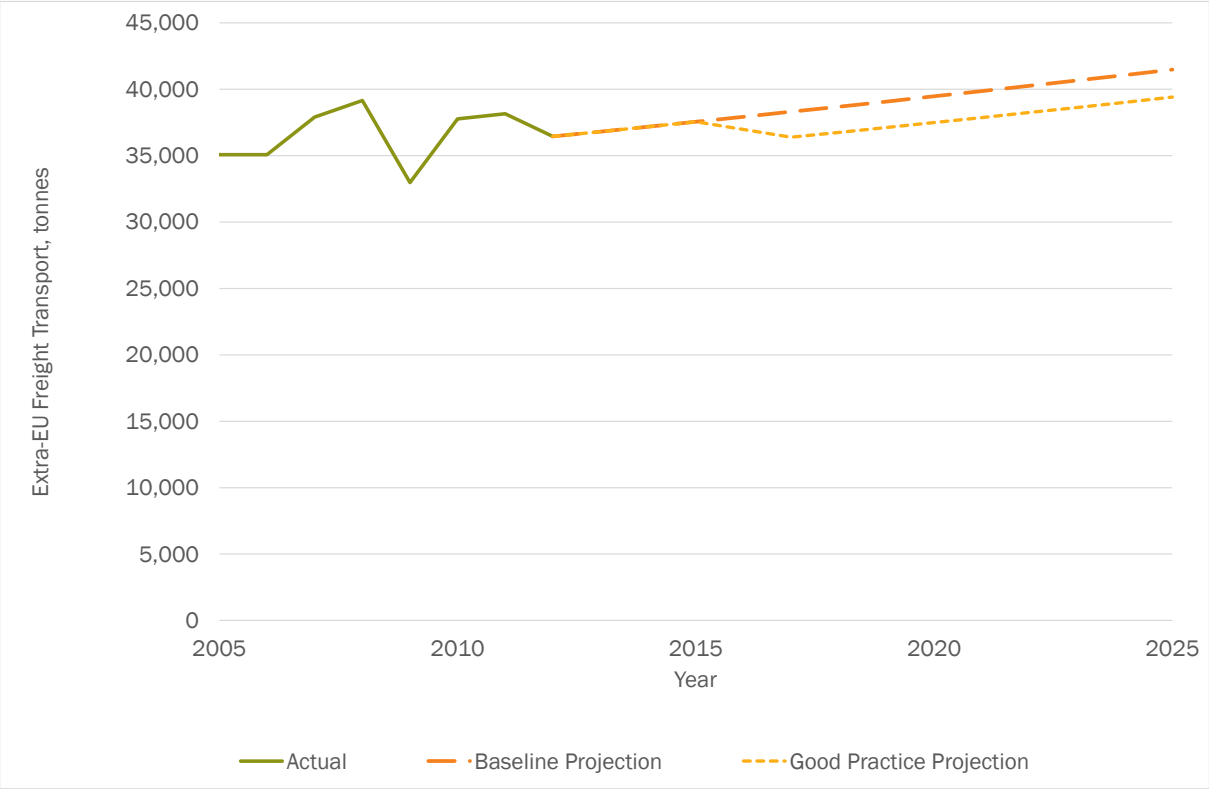


Figure 81: Change in Non-Hazardous Waste Landfilled, thousand tonnes

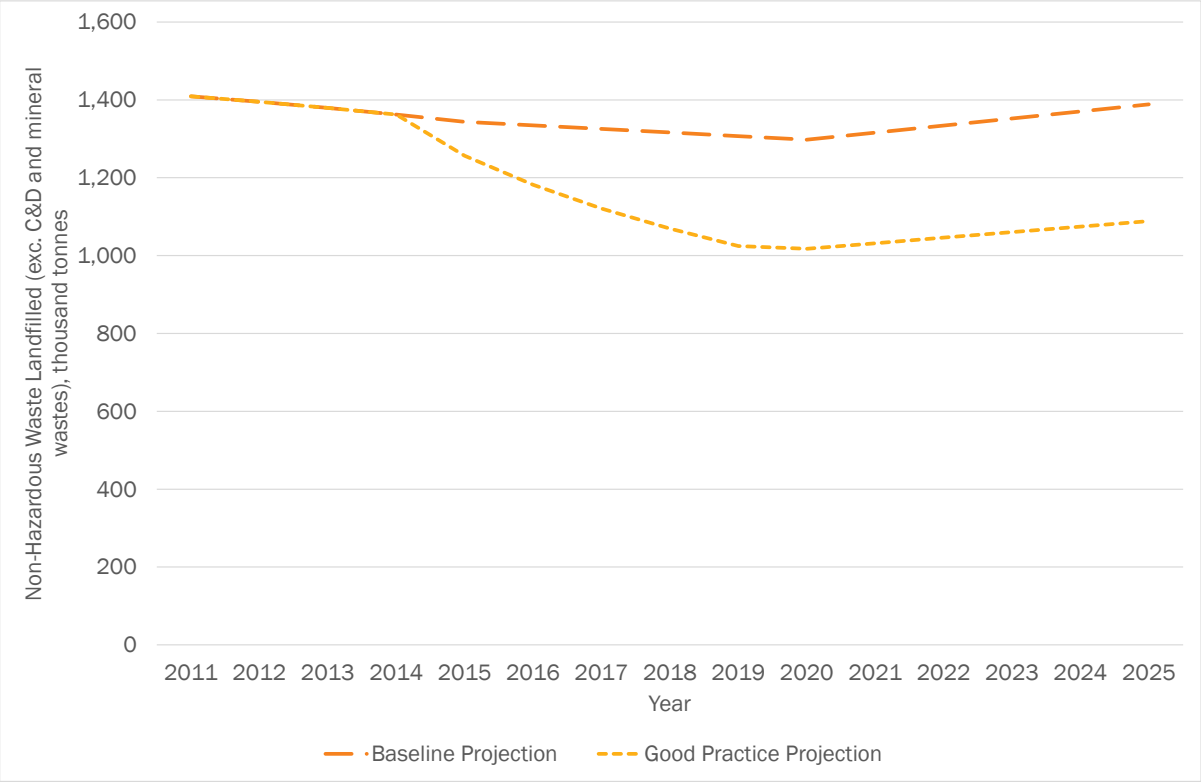


Figure 82: Change in MBT/ Incineration, thousand tonnes

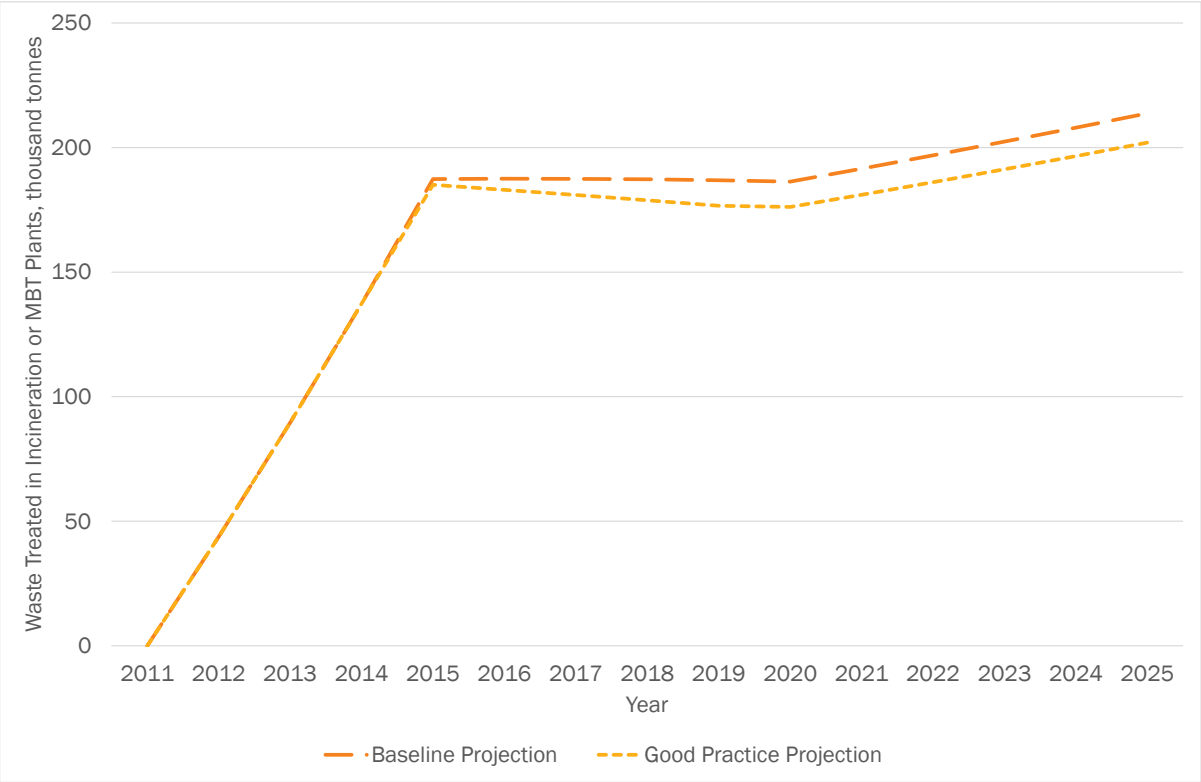


Figure 83: Change in SOx Emissions, tonnes

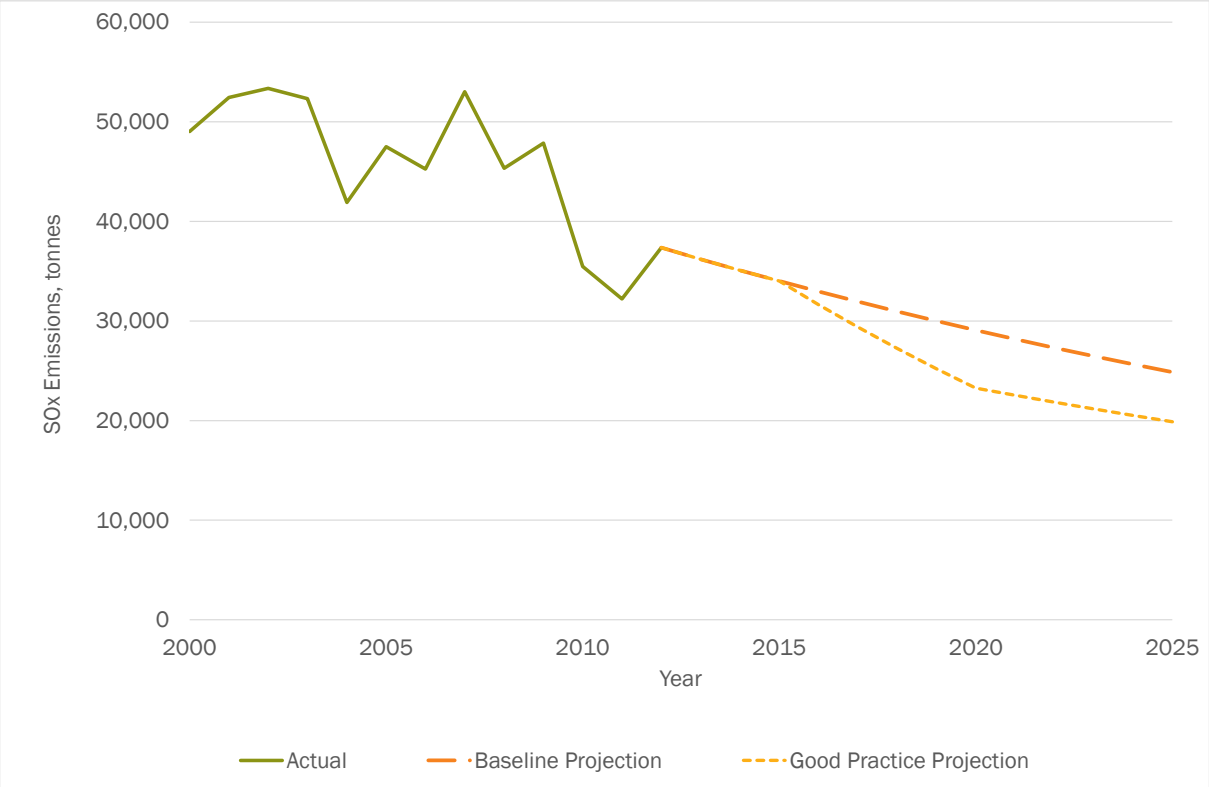


Figure 84: Change in NOx Emissions, tonnes

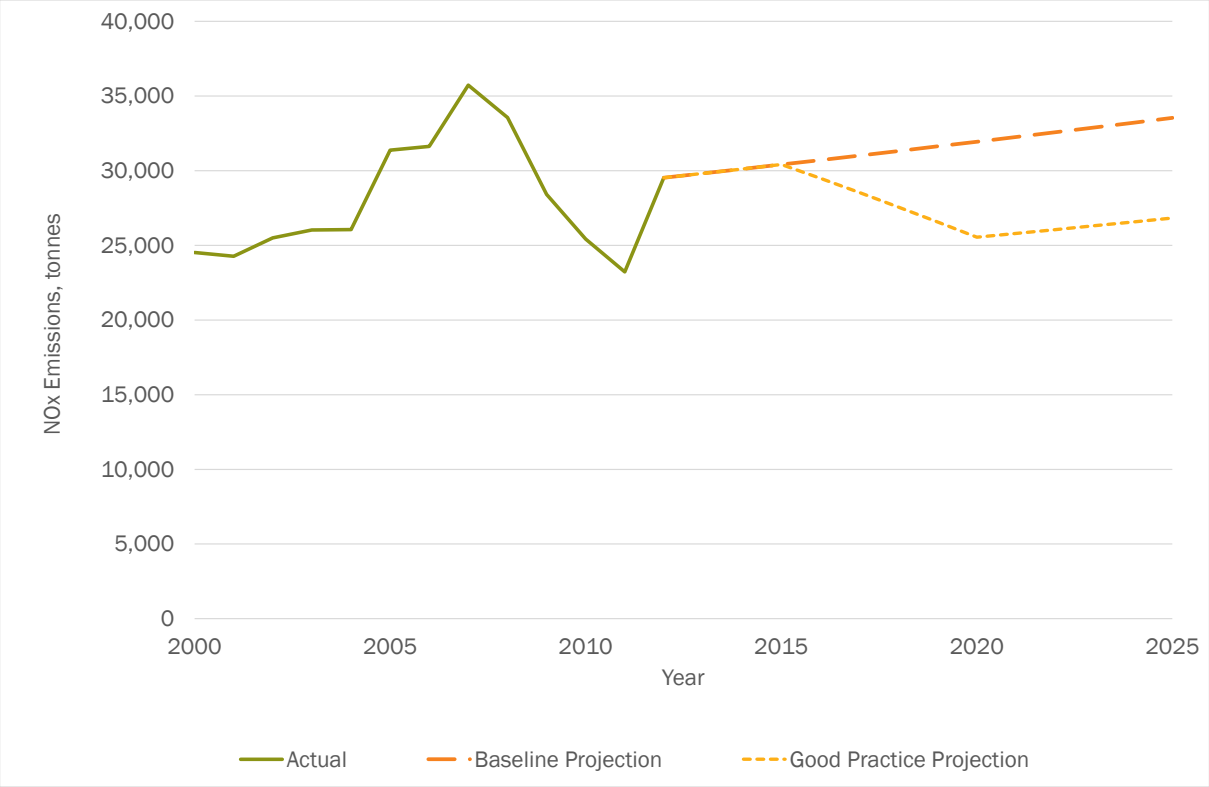


Figure 85: Change in PM_{10} Emissions, tonnes

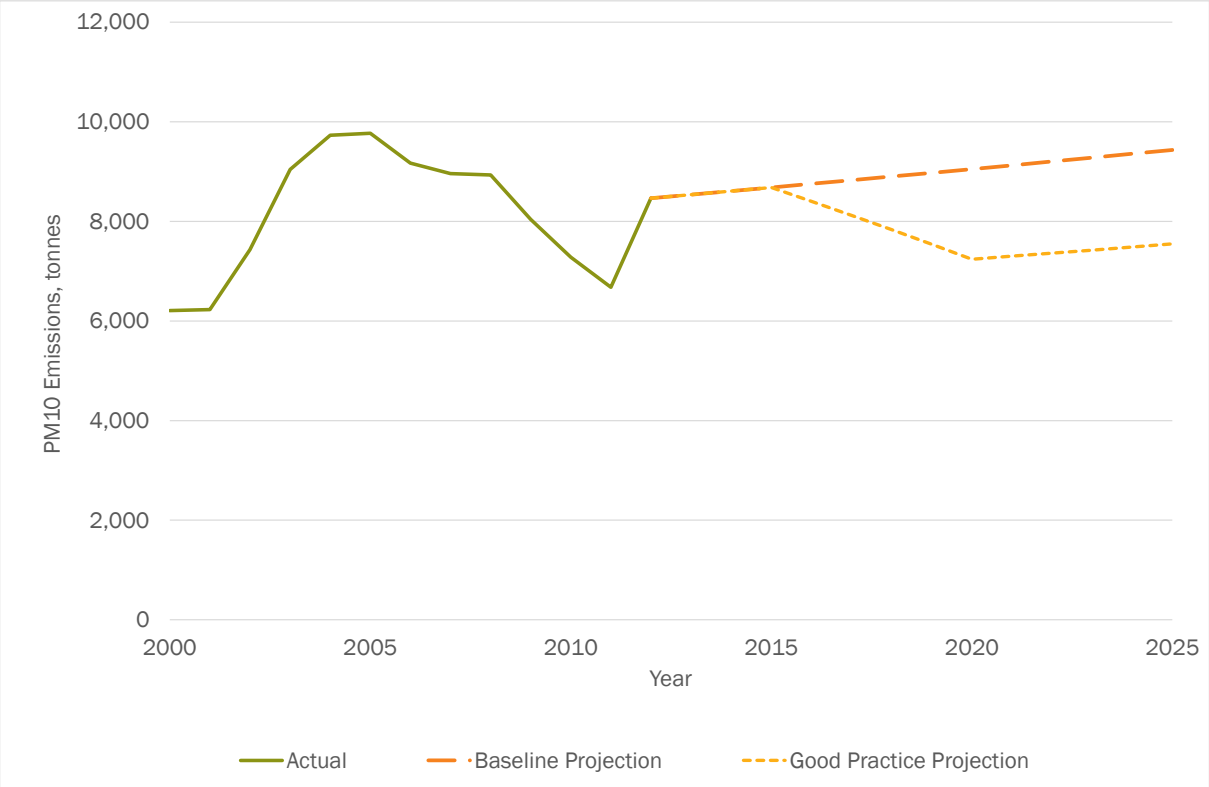


Figure 86: Change in Groundwater Abstraction – Public Supply, million cubic metres

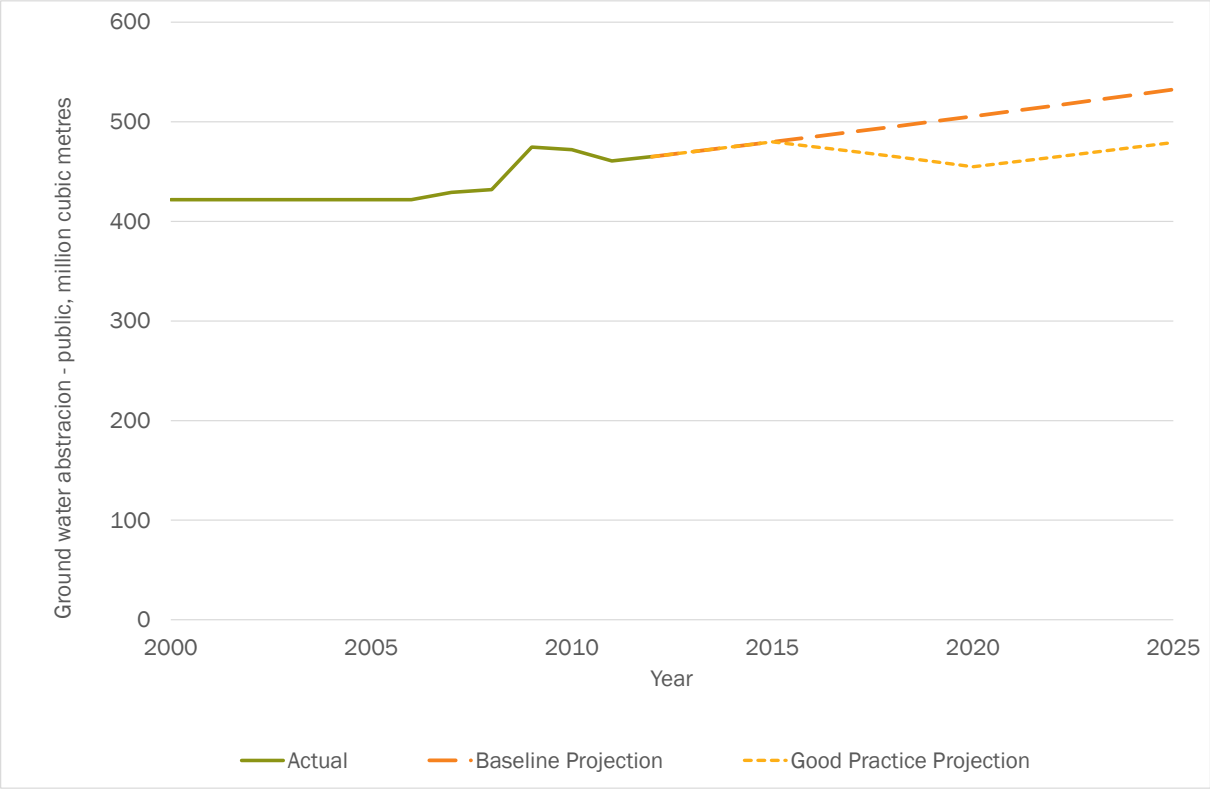


Figure 87: Change in Groundwater Abstraction – Manufacturing, million cubic metres

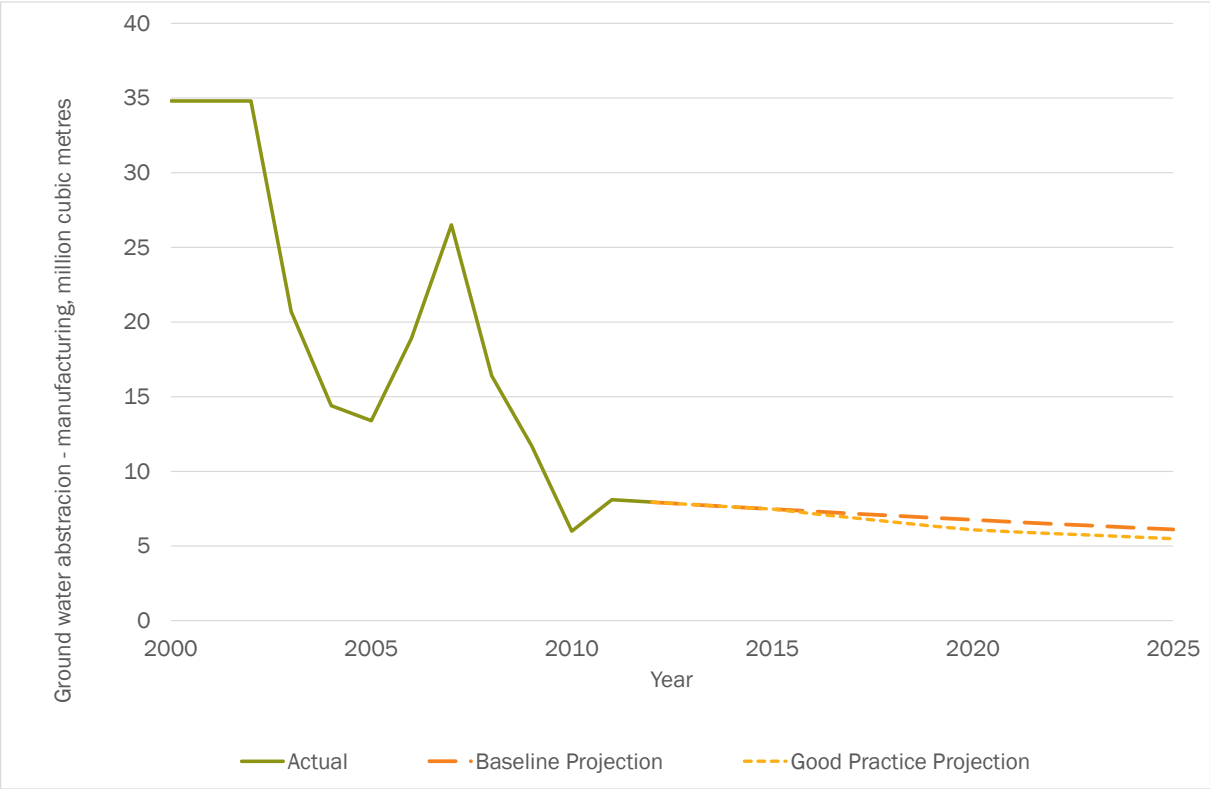


Figure 88: Change in Groundwater Abstraction – Agriculture, million cubic metres

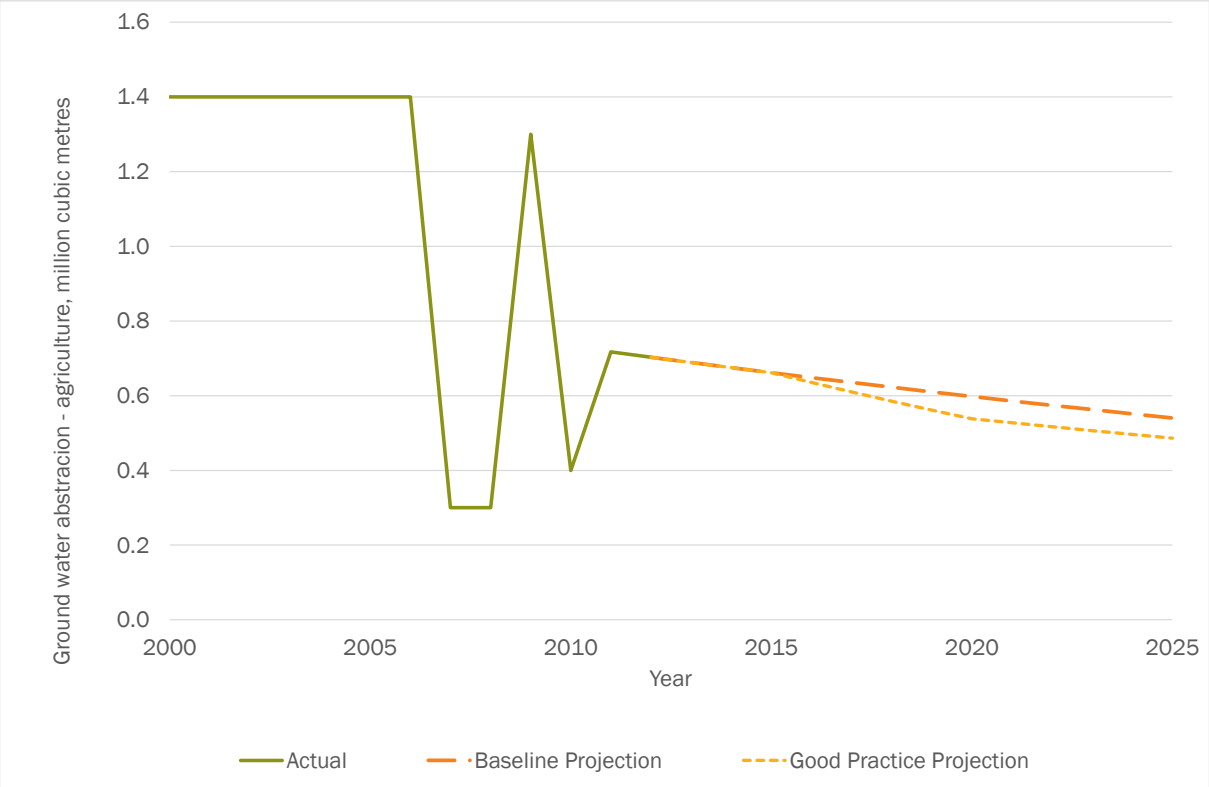


Figure 89: Change in Surface Water Abstraction – Public Supply, million cubic metres

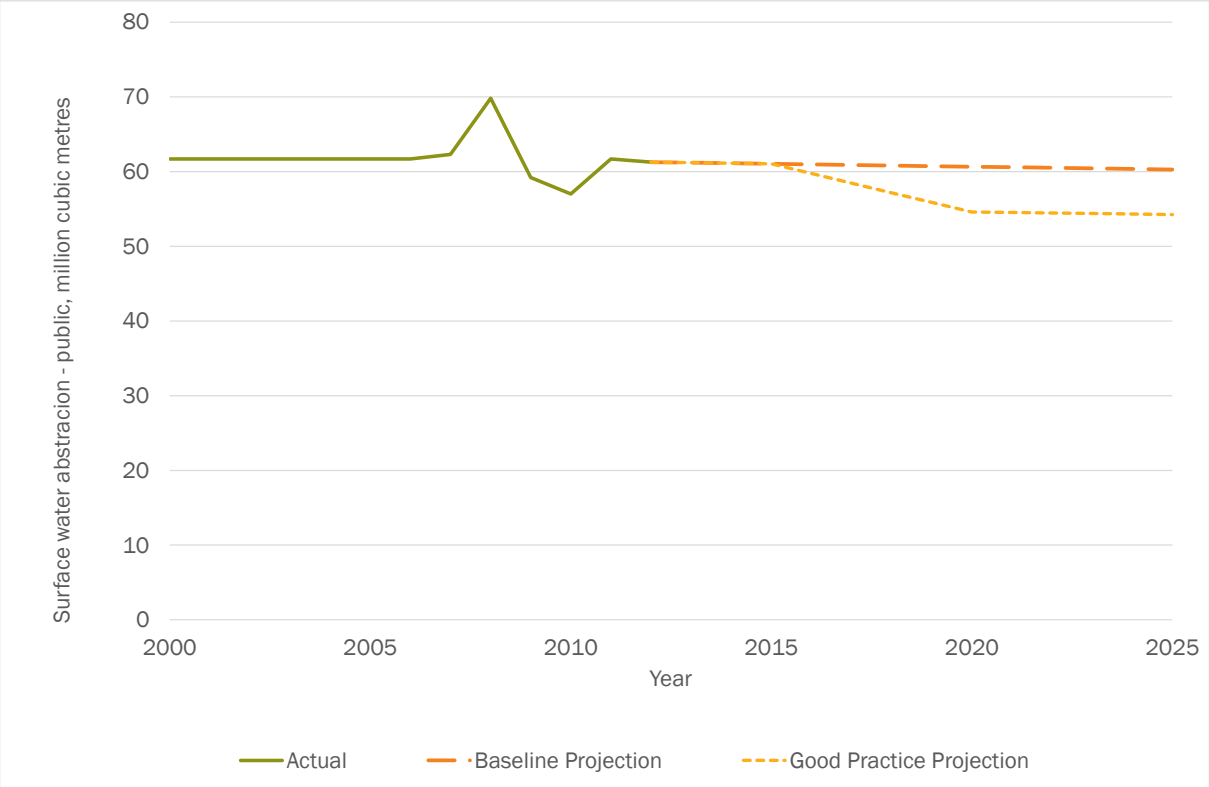


Figure90: Change in Surface Water Abstraction – Manufacturing, million cubic metres

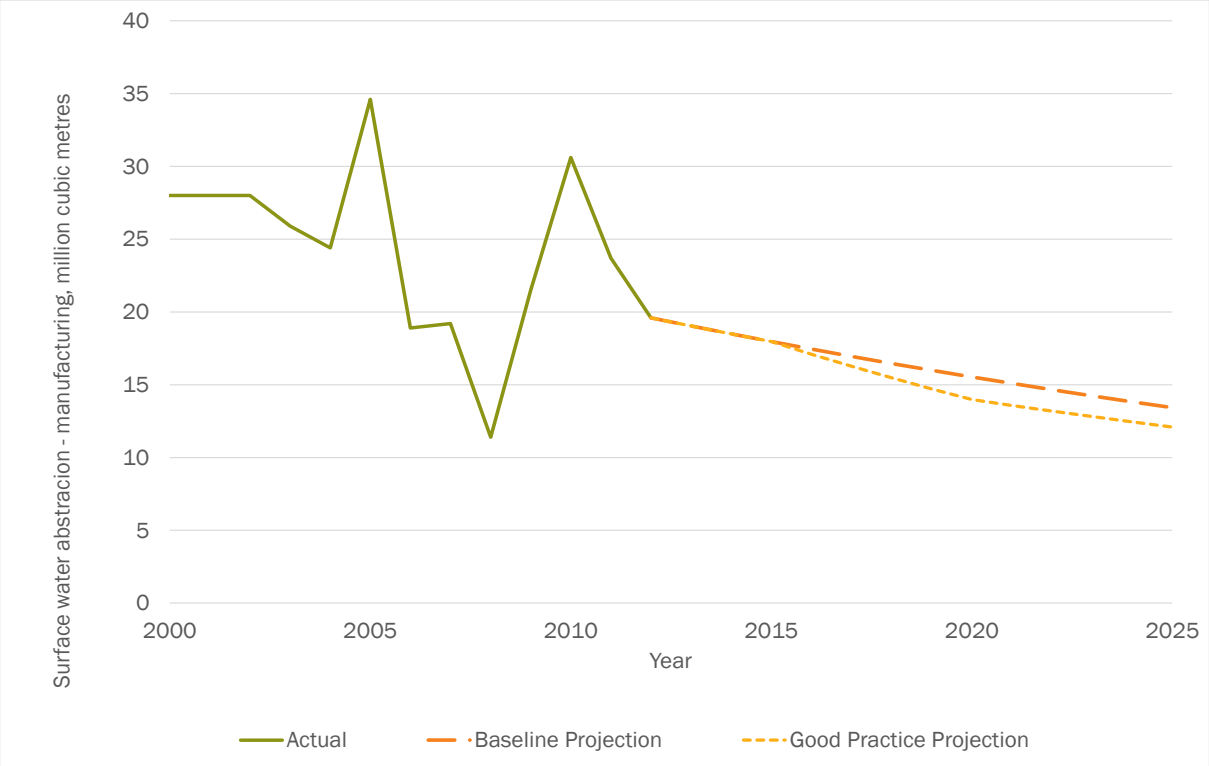


Figure 91: Change in Surface Water Abstraction – Agriculture, million cubic metres

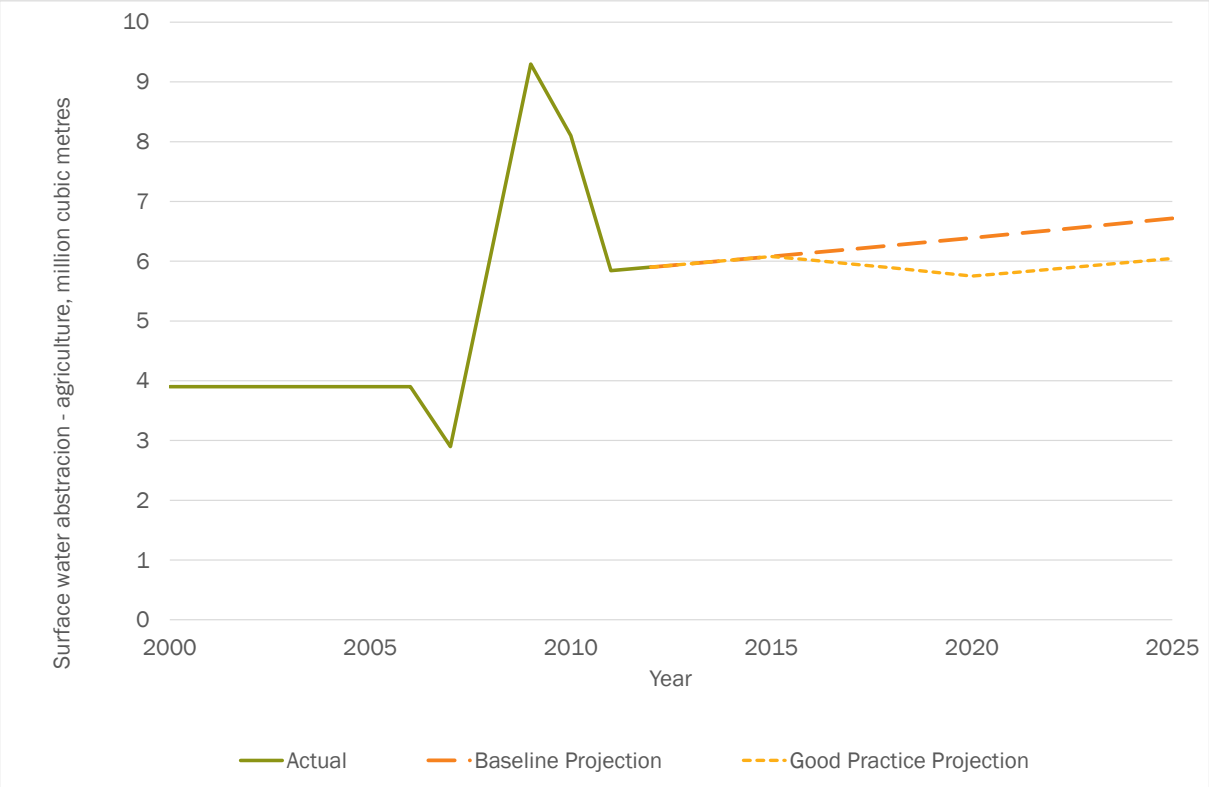


Figure 92: Change in Active Ingredients in Pesticides, tonnes

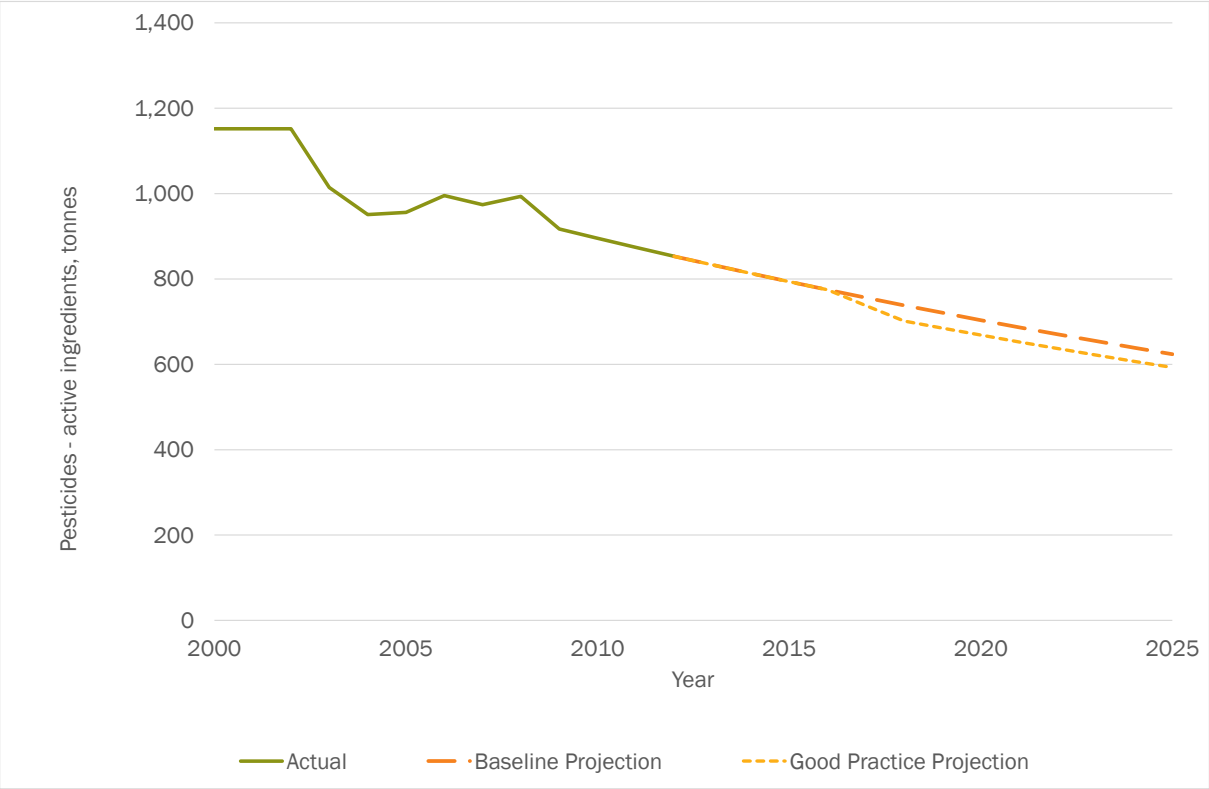


Figure 93: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

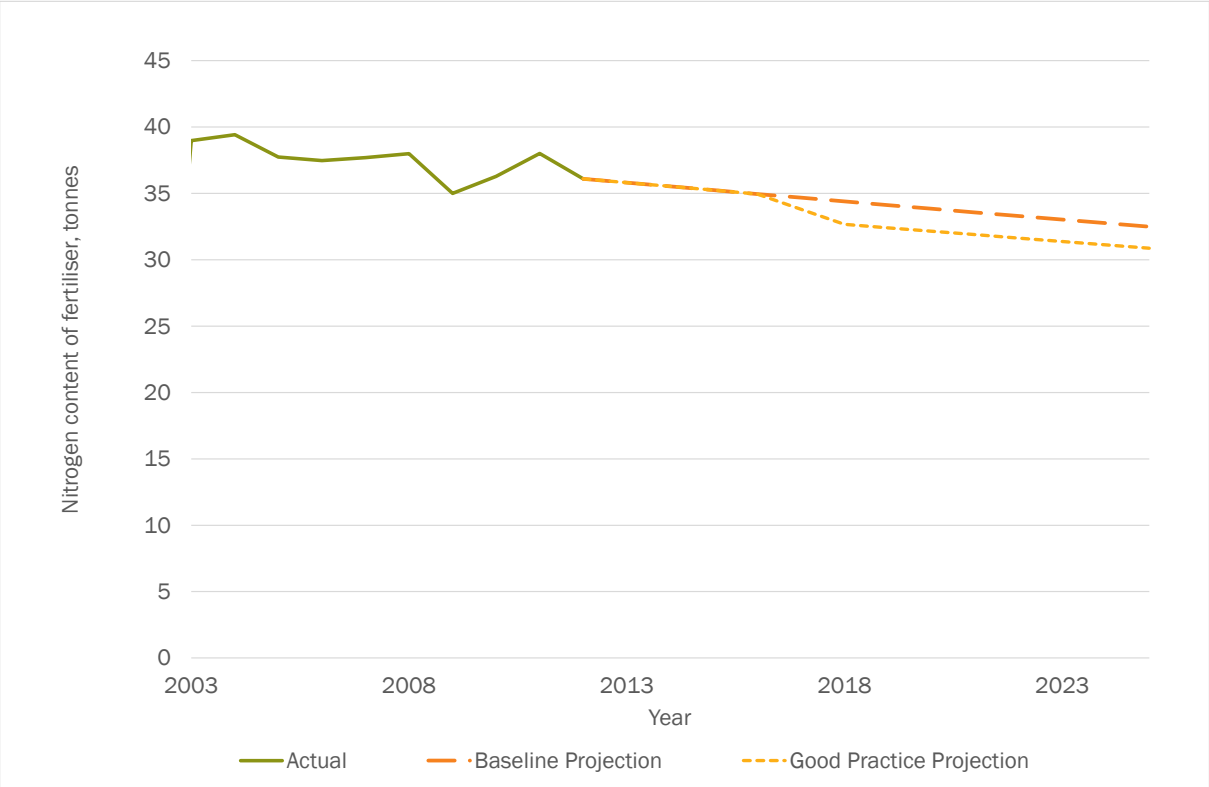


Figure 94: Change in Aggregates Extraction, thousand tonnes

Figure 95: Change in Paper & Card Packaging Generation, thousand tonnes

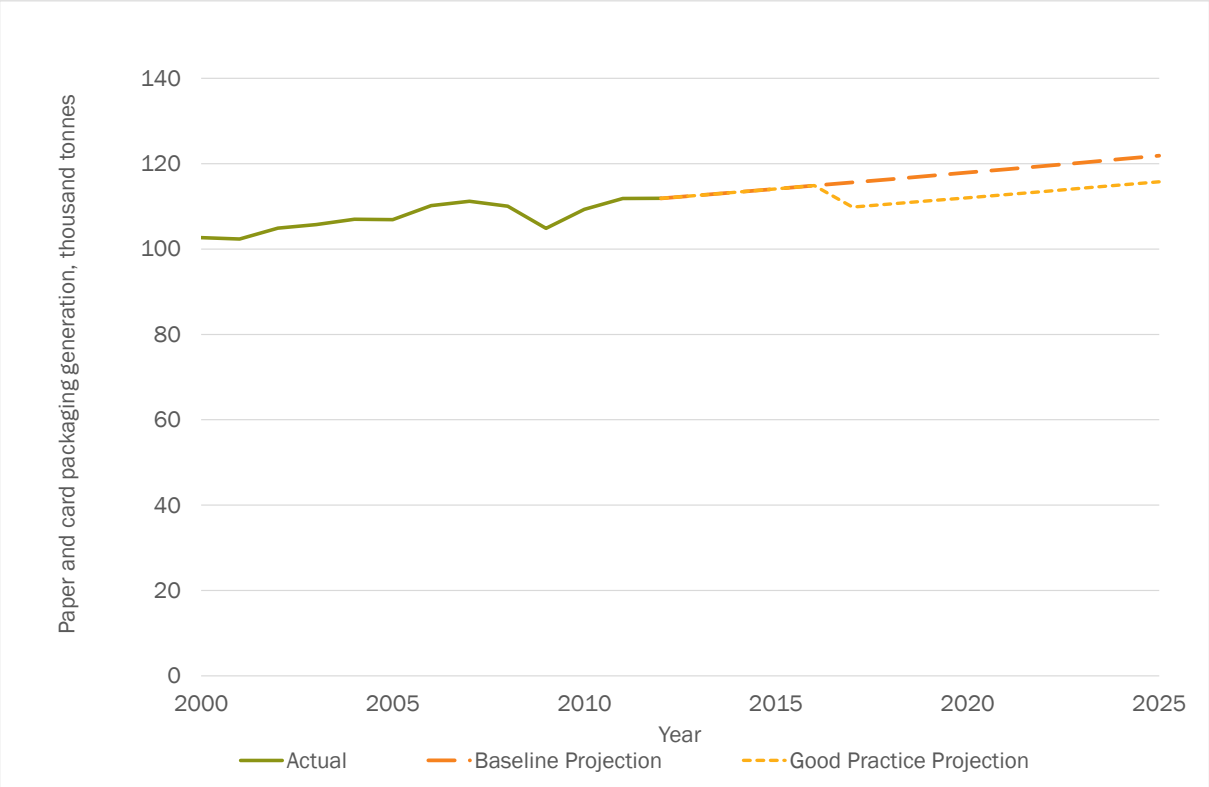


Figure 96: Change in Plastic Packaging Generation, thousand tonnes

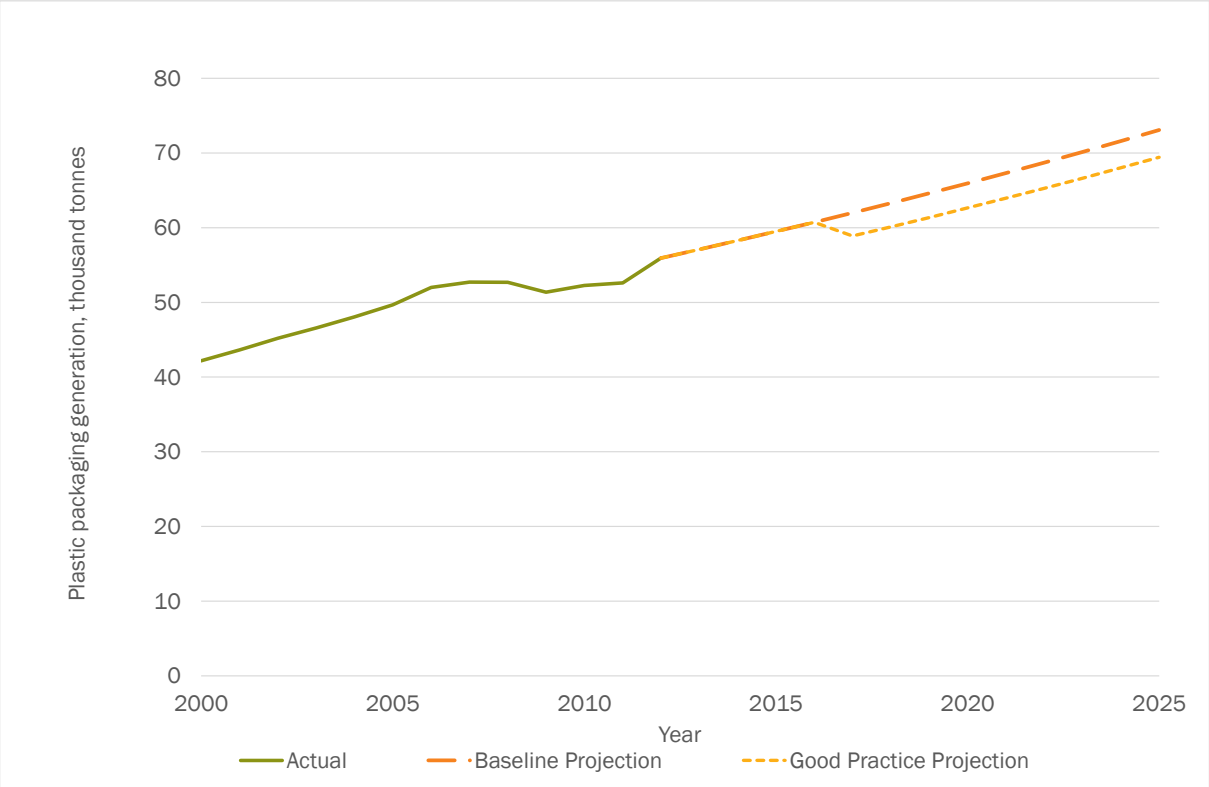


Figure 97: Change in Wood Packaging Generation, thousand tonnes

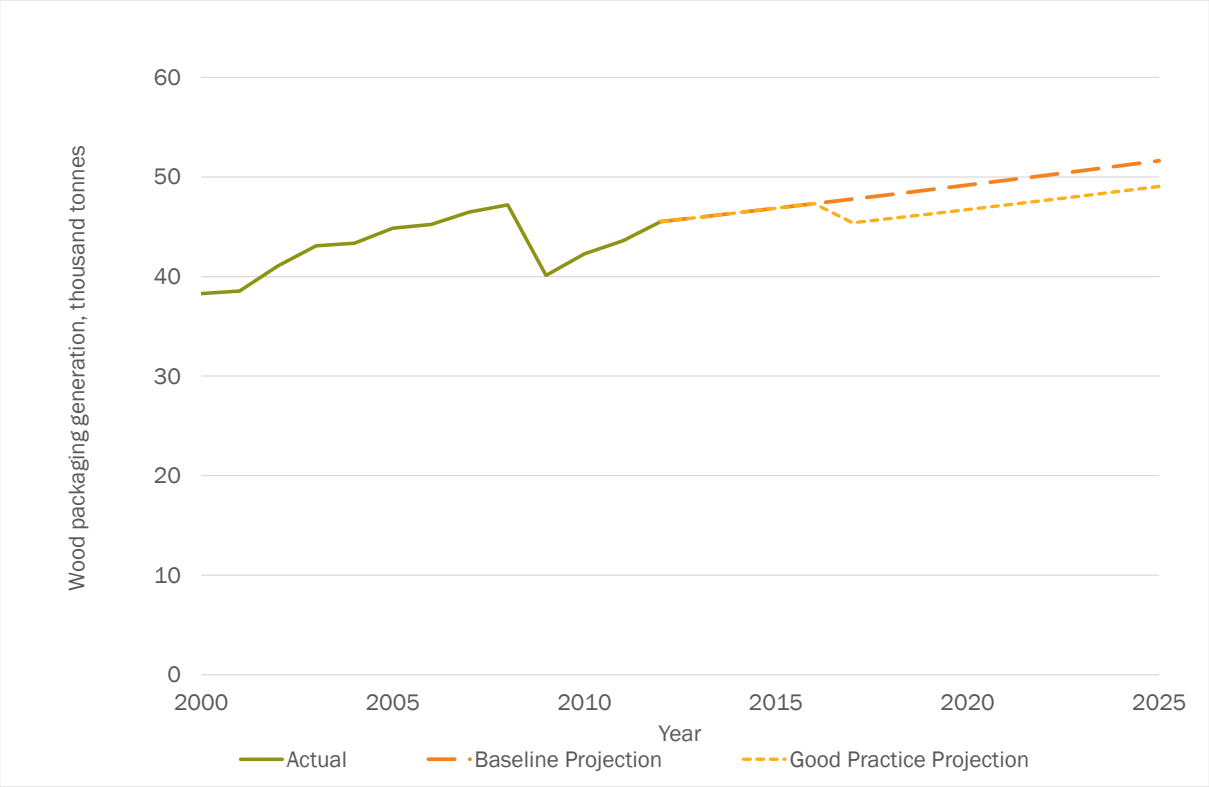


Figure 98: Change in Metal Packaging Generation, thousand tonnes

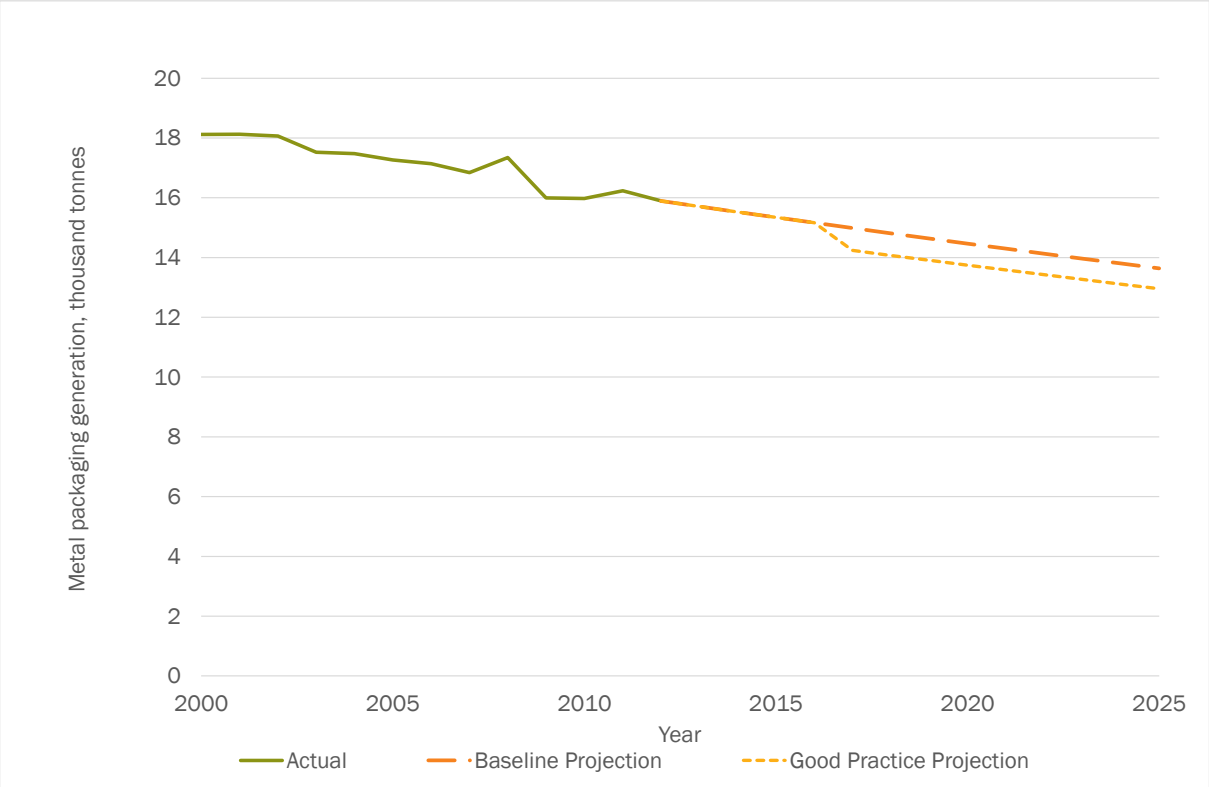


Figure 99: Change in Glass Packaging Generation, thousand tonnes

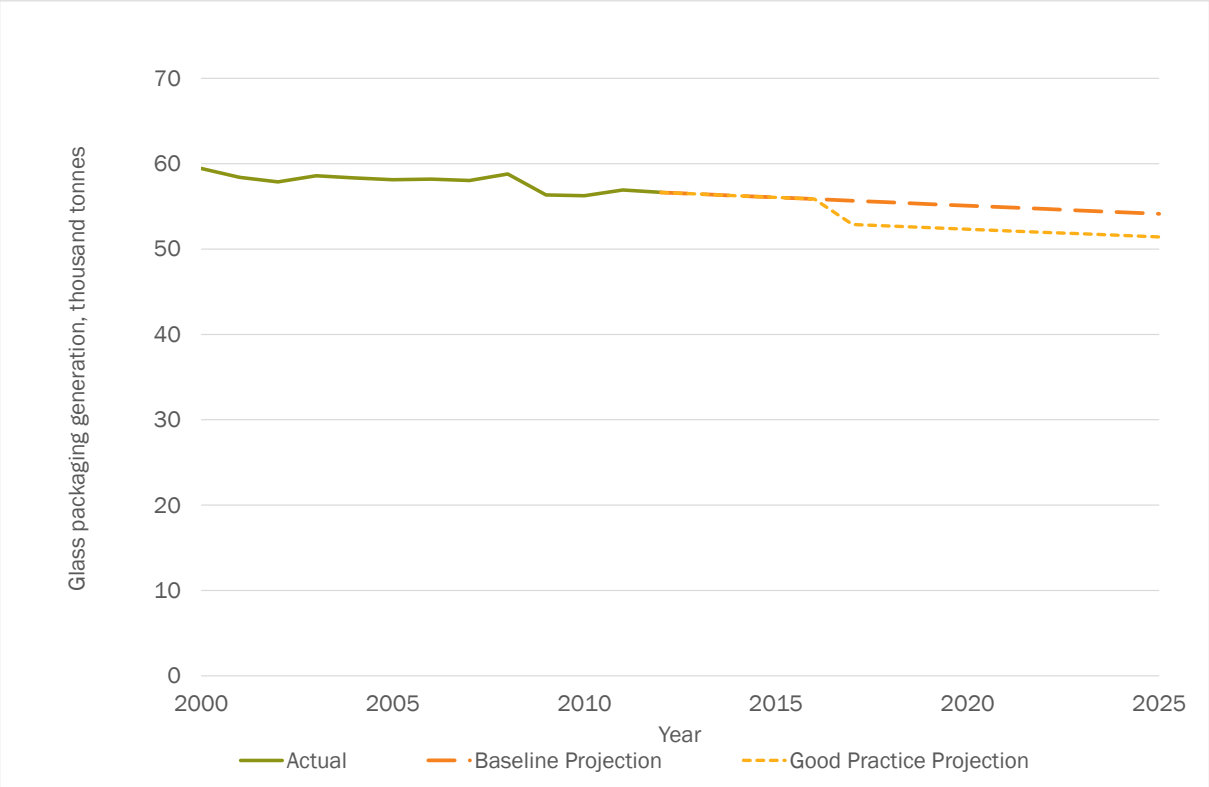
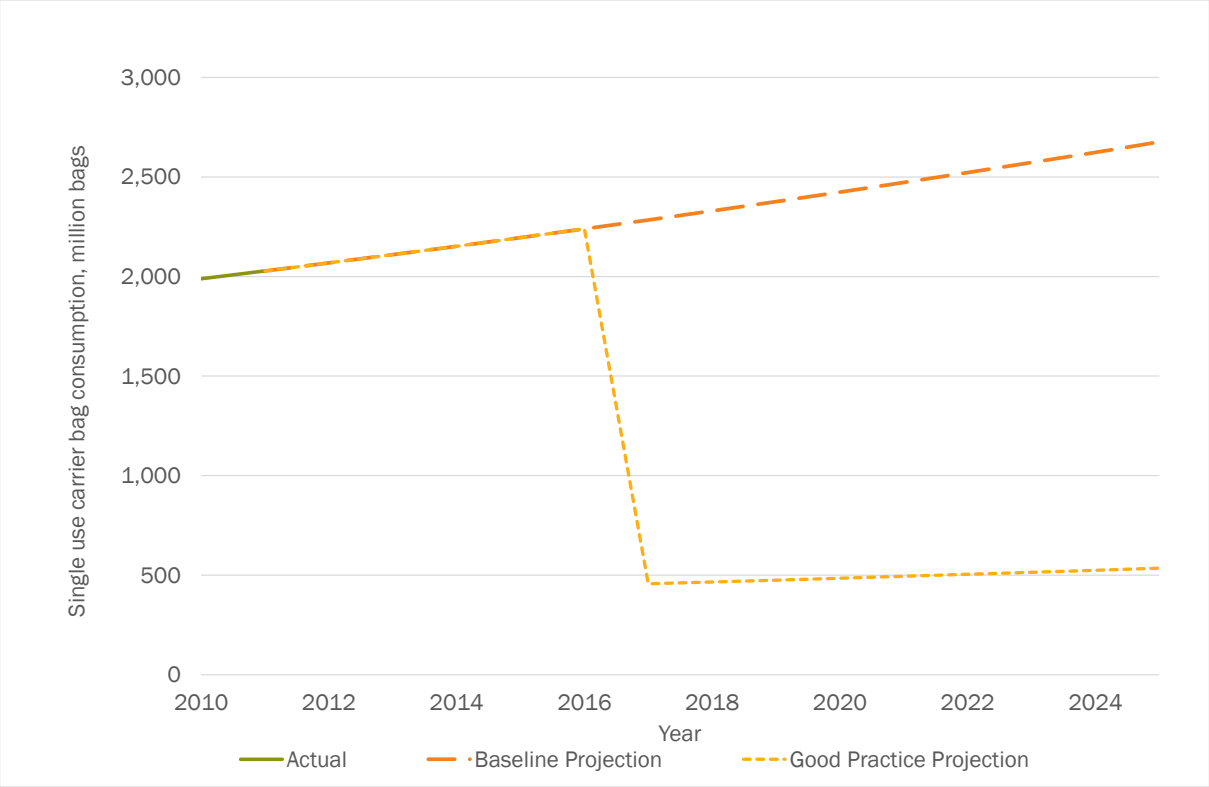


Figure 100: Change in Consumption of Single Use Carrier Bags, million bags



A.7.6 Full Revenue Outputs

Table 169: Revenue Outturns from Model, million HRK (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	159	316	470	623	774	923	1,072	1,219	1,219	1,219
	C&I / Heating	0	0	89	175	260	260	260	260	260	260	260	260
	Electricity	0	26	26	26	26	26	26	26	26	26	26	26
	Sub-total Energy, million HRK	*0*	*26*	*273*	*516*	*755*	*908*	*1,059*	*1,209*	*1,357*	*1,504*	*1,504*	*1,504*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.1%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	258	519	781	1,045	1,331	1,347	1,363	1,380	1,396	1,413
	Passenger Aviation Tax	0	0	455	893	900	907	914	921	928	935	942	949
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Transport, million HRK	*0*	*0*	*714*	*1,412*	*1,681*	*1,952*	*2,245*	*2,268*	*2,291*	*2,315*	*2,338*	*2,362*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.4%*	*0.5%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	96	181	257	327	391	388	394	399	405	410	416

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	1	0	0	0	0	0	0
	Incineration /MBT Tax	0	4	8	12	16	20	20	21	21	22	23	23
	Air Pollution Tax	0	121	230	327	415	491	464	462	460	458	456	454
	Water Abstraction Tax	0	2	4	6	8	9	9	9	8	8	8	8
	Waste Water Tax	0	130	251	364	351	351	351	351	351	351	351	351
	Pesticides Tax	0	0	30	56	54	52	51	50	49	47	46	45
	Aggregates Tax	0	0	95	86	76	67	57	57	57	57	57	57
	Packaging Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Single Use Bag Tax	0	269	274	50	51	52	53	54	55	56	57	59
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million HRK	*0*	*622*	*1,073*	*1,159*	*1,297*	*1,434*	*1,394*	*1,397*	*1,401*	*1,405*	*1,409*	*1,413*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.2%*	*0.3%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
	Total, million HRK	0	648	2,061	3,087	3,733	4,294	4,698	4,874	5,049	5,223	5,251	5,279

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.2%	0.6%	0.9%	1.1%	1.2%	1.3%	1.3%	1.4%	1.4%	1.4%	1.4%

A.8.0 Czech Republic: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

The information below is mainly from the European Commission's Tax-UD database[763] and Excise Duties Tables[764] as well as the OECD/EEA's environmental tax database[765] with some additional information being gather as appropriate from other sources. In all cases care has been taken to cite the source of information in detail so that it can be cross referred to by interested readers.

A.8.1 Energy

- New levies for energy products and electricity were implemented in 2008 to supplement existing taxes on mineral oils.[766] The taxes allow for a number of exemptions and reduced rates which vary by material. The individual taxes and revenues are listed below, and a breakdown of specific tax rates is presented in Table 170:

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[763] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[764] European Commission - Taxation and Customs Union (2013) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2013, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[765] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

[766] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=831/1366022145&taxType=Energy+products+and+electricity

- An excise duty on the following mineral oils: petrol, gas oil, kerosene, heavy fuel oil and liquid petroleum gas (LPG).[767] Tax revenues in 2012 totalled 78,832 million CZK (€3,143 million), equivalent to 0.84% of GDP.[768,769,770]
- An excise duty on electricity supplied to business and non-business users.[771] Tax revenues in 2012 totalled 1,347 million CZK (€54 million), equivalent to 0.014% of GDP.[772]
- An excise duty on natural gas and other gases.[773] Tax revenues in 2012 totalled 1,258 million CZK (€50 million), equivalent to 0.013% of GDP.[774]

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[767] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.8-47, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[768] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[769] Currency conversions from CZK to € were calculated using exchange rates from the following sources:

2012 - European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, p.6, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

All other years - Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 2nd December 2013, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[770] All % GDP values in this section are calculated using data from: Eurostat (2013) *GDP and main components - Current prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAMA_GDP_C

[771] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.64-70, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[772] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[773] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.48-56, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[774] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

- An excise duty on the solid fuels: coal, coke and lignite.[775] Tax revenues in 2012 totalled 454 million CZK (€18 million), equivalent to 0.0048% of GDP.[776]

Table 170: Excise Duty Rates (1st July 2013)

Tax Type	Tax Object	Unit	Tax Rate	
			CZK	EUR
Excise Duty on Mineral Oils	Petrol – Leaded	per 1000 litres	13,710.00	533.17
	Petrol – Unleaded	per 1000 litres	12,840.00	499.34
	Gas Oil - Propellant use	per 1000 litres	10,950.00	425.84
		per 1000 litres	7,665.00[1]	298.09
	Gas Oil - Industrial/Commercial use	per 1000 litres	10,950.00[2]	425.84
	Gas Oil - Heating (business)	per 1000 litres	10,950.00	425.84
	Gas Oil - Heating (non-business)	per 1000 litres	10,950.00	425.84
	Kerosene - Propellant use	per 1000 litres	10,950.00	425.84
	Kerosene - Industrial/Commercial use	per 1000 litres	10,950.00	425.84
	Kerosene - Heating (business)	per 1000 litres	10,950.00	425.84
	Kerosene - Heating (non-business)	per 1000 litres	10,950.00	425.84
	Heavy Fuel Oil - Heating (business)	per 1000 kg	472.00	18.36
	Heavy Fuel Oil - Heating (non-business)	per 1000 kg	472.00	18.36
	LPG - Propellant use	per 1000 kg	3,933.00	152.95
	LPG - Industrial/Commercial use	per 1000 kg	1,290.00	50.17
	LPG - Heating (business)	per 1000 kg	0.00	0.00
	LPG - Heating (non-business)	per 1000 kg	0.00	0.00
Excise Duty on Natural Gas	Propellant use	per GJ	9.50	0.37
	Industrial/Commercial use	per GJ	8.50	0.33
	Heating (business)	per GJ	8.50	0.33
	Heating (non-business)	per GJ	8.50	0.33
Excise Duty on Electricity	Business use	per MWh	28.30	1.10
	Non-business use	per MWh	28.30	1.10
	Coal and Coke - Heating (business)	per GJ	8.50	0.33

[775] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.57-63, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[776] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

Tax Type	Tax Object	Unit	Tax Rate	
			CZK	EUR
Excise Duty on Solid Fuels	Coal and Coke - Heating (non-business)	per GJ	8.50	0.33
Notes: *1. For diesel blends comprising of not less than 30% of rapeseed oil methyl ester of volume, reduced rates apply until 30th June 2015.* *2. There is a reimbursement of excise duty of 10290 CZK per 1,000 litres when it has been duly proved that the gas oil has been used for heating purposes.*				

Source: European Commission (2013) Excise Duty Tables, Accessed 2nd December 2013, pp.8-70, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- A levy on electricity from solar radiation has been in place since 2011.[777] The tax basis is the amount, without VAT, paid from electricity suppliers to electricity producers. The tax is payable by all producers of solar power, with a tax rate of 26% being applied for all electricity being sold under the guaranteed purchasing price and 28% if the electricity is sold under the 'green bonus' scheme.[778] As of 1st January 2014 these rates will be reduced to 10% and 11% respectively. Tax revenues in 2012 totalled 6,403 million CZK (€255 million), equivalent to 0.068% of GDP.[779]

A.8.2 Transport (excl. transport fuels)

- Registration tax:
  - In addition to a basic car registration fee, an 'environmental' car registration fee was introduced in 2009 for all passenger cars.[780] This fee is paid for the first registration of imported used vehicles in the Czech Republic and for the first re-registration of vehicles already in

[777] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=1281/1357119692&taxType=Other+indirect+tax

[778] In the Czech Republic operators who produce electricity from PV are entitled to financial support via a feed-in tariff and a premium 'green bonus' for electricity produced within certain timeframes. See, for example, Czech republic, Energy Regulator Office (2012) *Price Decision of Energy Regulatory Office No. 4/2012 from 26 November 2012, by Which the Support for Supported Energy Sources are Laid Down*, November 2012, www.eru.cz/user_data/files/cenova%20rozhodnuti/english/Price_decision_ERO_4_2012.pdf

[779] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[780] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

the Czech Republic.[781] The rates of the car registration fee vary depending on the EURO emission standards of the vehicle:[782]

  - Vehicles that do not meet EURO I or EURO II emissions standards: 10,000 CZK (€389);
  - Vehicles with EURO I emissions standards: 5,000 CZK (€194); and
  - Vehicles with EURO II emissions standards: 3,000 CZK (€117).

- Vehicles which meet EURO 3 emission limits are exempted from the above fee. The car registration fee is carried out at two levels. Regional registry offices carry out all work associated with determination and collection of the charges, whilst the final collection and utilization of the revenues is undertaken by the Czech Republic's State Environmental Fund. The fund administers a so-called 'car wreck disposal program' and the revenues from this fee serve to support the collection, processing, and disposal of car wrecks. In 2012, 334 million CZK (€13.3 million) was raised from the registration fee and used to support the recovery of car wrecks (equivalent to 0.009% of GDP).[783]

➢ Circulation tax:

- A separate commercial road tax applies to all vehicles used for business activities.[784] Tax rates are differentiated according to vehicle age and emissions control level and vary from 1,200 CZK (€47) to 4,200 CZK (€163) per year for personal cars and from 1,800 CZK (€70) to 50,400 CZK (€1,960) per year for other motor vehicles.[785,786] Tax revenues in 2012 totalled 5,206 million CZK (€208 million), equivalent to 0.055% of GDP.[787]

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[781] § 37e of: Czech Republic Parliament (2001) *Act no. 185/2001 Coll., on Waste and the Amendment of Some Other Acts (as amended)*, http://www.mzp.cz/ris/vis-legcz-en.nsf/2FE1CCCFB48F540EC125772D003BE2E6/$file/2001_185_ENrev.pdf

[782] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

[783] www.sfzp.cz

[784] European Commission (2013) *"Taxes in Europe Database"*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=97/1357119692&taxType=Other+indirect+tax

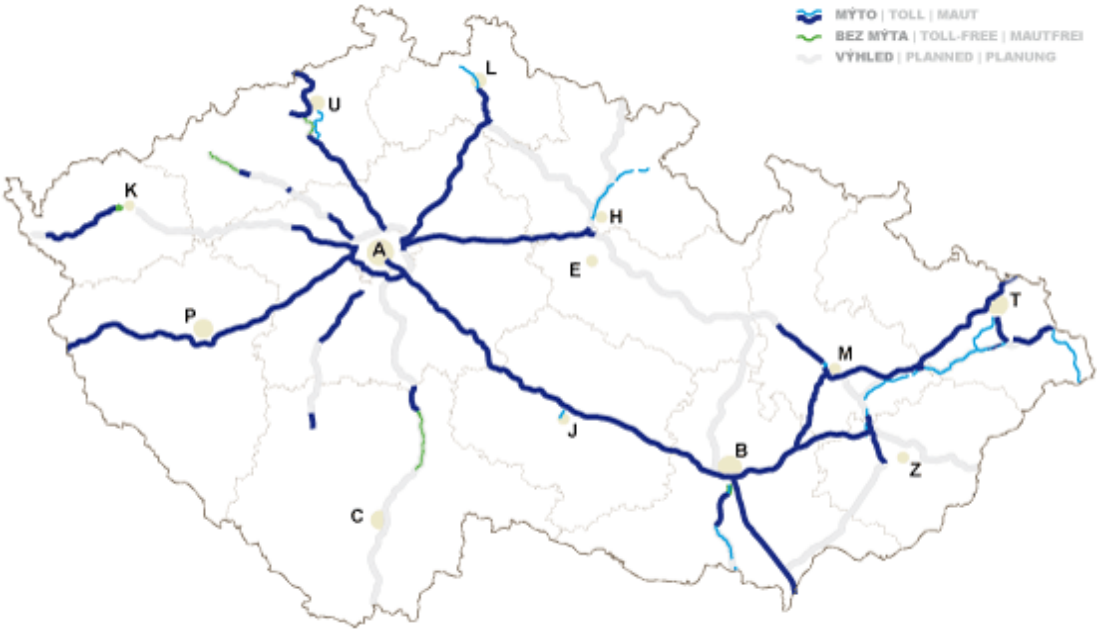
[785] OECD (2005) Environmental Performance Reviews: Czech Republic 2005, October 2005

[786] European Commission (2013) *"Taxes in Europe Database"*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=99/1167609600&taxType=Other+indirect+tax

[787] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

- Charges and fees:
  - A highway usage fee is in place for all vehicles whose maximum weight does not exceed 3.5 tonnes and are currently using motorways, high-speed roads and selected class I roads.[788] The highway fee is currently set at 1,500 CZK (€58) per year for vehicles weighing up to 3.5 tonnes. Revenues from this fee were reported to be CZK 3,872 million (€154 million) in 2012.[789]
  - For vehicles whose maximum weight exceeds 3.5 tonnes a system of road tolls apply on certain stretches of the motorways, high-speed roads and selected class I roads. The rates differ by vehicle category (buses, others), the road used (motorways and high-speed roads, selected class I roads), time of day (Friday 3-9 p.m. v the rest time of week), emissions performance and number of axles. The toll rate varies between a minimum of CZK 0.79 (€0.03) per km and a maximum of CZK 11.76 (€0.46) per km.. Only certain national motorways are tolled (Figure 101) via means of video cameras which record the registration details of the passing vehicles.

Figure 101: Tollable Road Network in the Czech Republic



Source: Motorway Network, Czeck Republic (2014) Toll (>3.5 t), Date Accessed: 7 January 2014, Available at: www.motorway.cz/toll

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[788] European Commission (2013) *"Taxes in Europe Database"*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=99/1167609600&taxType=Other+indirect+tax. See also www.mdcr.cz.

[789] Professor Jirina Jilkova, Prague University of Economics, based on consultations with experts from the Czech Republic's Ministry of Finance and Ministry of Environment

- Motor vehicle entry fees are levied on the entrance to selected places in the Czech Republic. The tax rate is set by local government and can be up to a maximum of 20 CZK (€0.78) per day.[790]

A.8.3 Pollution and Resources

- An air pollution tax is levied on emissions of a number of specified pollutants.[791] Tax revenues in 2011 totalled 440 million CZK (€17.9 million), equivalent to 0.0048% of GDP.[792] The pollutants and associated tax rates are displayed below. An increase in these rates has been announced, motivated by air quality targets:
  - Nitrogen oxides: [793]
    - 1,100 CZK per tonne (€40.03) in 2013-16
    - 1,700 CZK per tonne (€61.86) in 2017
    - 2,200 CZK per tonne (€80.06)in 2018
    - 2,800 CZK per tonne (€101.89) in2019
    - 3,300 CZK per tonne (€120.09)in 2020
    - 3,900 CZK per tonne (€141.92) from 2021 onwards
  - Particulate matter:[794]
    - 4,200 CZK per tonne (€152.84) in 2013-16
    - 6,300 CZK per tonne (€229.26) in 2017
    - 8,400 CZK per tonne (€305.68) in 2018
    - 10,500 CZK per tonne (€382.1) in2019
    - 12,600 CZK per tonne (€458.52) in 2020
    - 14,700 CZK per tonne (€534.93) from 2021 onwards
  - Sulfur dioxide:[795]
    - 1,350 CZK per tonne (€49.13) in 2013-16
    - 2,100 CZK per tonne (€76.42) in 2017
    - 2,800 CZK per tonne (€101.89) in 2018
    - 3,500 CZK per tonne (€127.37) in2019

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[790] European Commission (2013) *"Taxes in Europe Database"*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=96/1357119692&taxType=Other+indirect+tax

[791] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* www2.oecd.org/ecoinst/queries/index.htm

[792] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

[793] Act no. 201/2012 Coll., Air Protection Act, as amended.

[794] Act no. 201/2012 Coll., Air Protection Act, as amended.

[795] Act no. 201/2012 Coll., Air Protection Act, as amended.

    - 4,200 CZK per tonne (€152.84) in 2020
    - 4,900 CZK per tonne (€178.31) from 2021 onwards
  - Volatile organic compounds:[796]
    - 2,700 CZK per tonne (€98.25) in 2013-16
    - 4,200 CZK per tonne (€152.84) in 2017
    - 5,600 CZK per tonne (€203.78) in 2018
    - 7,000 CZK per tonne (€254.73) in2019
    - 8,400 CZK per tonne (€305.68) in 2020
    - 9,800 CZK per tonne (€356.62) from 2021 onwards
- Ozone depleting chemicals are subject to a duty, with a tax rate of 400 CZK (€15.90) per kg.[797]
- A charge is in place for any withdrawal of groundwater with a total volume of more than 6,000m^3 annually (other exemptions are also in place).[798] This fee is set at 2 CZK (€0.0796) per m^3 if the water is to be used for drinking water supply or 3 CZK (€0.1195) per m^3 if the water is extracted for other uses. In 2011, revenues from the extraction of groundwater amounted to 716 million CZK (€29 million), equivalent to 0.019% of GDP.[799]
- The discharge of waste water into surface water is governed by a charging system.[800] The 'fee for the discharge of waste water into surface water' is proportionate to the amount of waste water discharged and is set at 0.10 CZK (€0.0040) per m^3, with an additional charge levied depending on the chemical composition of the water (Table 171). A different charge is specified for each kg of listed pollutants in the waste water. Revenues in 2012 totalled 212 million CZK (€9 million), equivalent to 0.0024% of GDP.[801]

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[796] Act no. 201/2012 Coll., Air Protection Act, as amended.

[797] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[798] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[799] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management,* www2.oecd.org/ecoinst/queries/index.htm

[800] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[801] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics. Also, www.sfzp.cz – Annual Report 2012.

Table 171: Fees for the Discharge of Waste Water into Surface Water

Pollution Type (Measured or Estimated Emissions)	Unit	Tax Rate
Emissions of organic substances, non-treated waste water	per kg	€0.6371
Emissions of organic substances, treated waste water	per kg	€0.3186
Amount of waste water	Per m^3	€0.0040
Emissions of absorbed organically bounded halogens	per kg	€11.9461
Emissions of ammonia nitrogen	per kg	€1.5928
Emissions of cadmium	per kg	€159.2807
Emissions of dissolved inorganic salts	per kg	€0.0199
Emissions of inorganic nitrogen	per kg	€1.1946€
Emissions of mercury	per kg	€796.4034
Emissions of organic substances, treated waste water from pulp and textile production	per kg	€0.1195.
Emissions of phosphor	per kg	€2.7874.
Emissions of un-dissolved substances	per kg	€0.0796

Source: OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management http://www2.oecd.org/ecoinst/queries/index.htm

- A fee is levied on the permitted discharge of waste water into underground sources.[802] The fee is 350 CZK (€13.94) per year per equivalent citizen (depending on the capacity of the sewerage plant). Revenues in 2011 derived from these fees totalled 2 million CZK (€81 thousand).[803]
- Two separate fees are payable by the mineral extraction industries. Businesses are required to pay for the use of mining areas, with the exact charge varying from 100 CZK (€3.96) to 1,000 CZK (€39.57) per hectare. A fee is also payable on extracted minerals. The fees for each mineral are set in proportion to the mineral's market value, and can be up to 10% of the market price.[804]
- The withdrawal (permanent or temporary) of land from forestry is subject to a fee. The tax rate is equal to the total value of the forest (i.e. yearly wood production in m^3 multiplied by market price) multiplied by a coefficient which

[802] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[803] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

[804] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

varies depending on the economic and environmental status of the forest. Tax revenues in 2011 totalled 64 million CZK (€2.6 million), equivalent to 0.0007% of GDP.[805]

- A fee is levied on the withdrawal (permanent or temporary) of land from agriculture.[806] The exact tax rate is based on a complex formula. Tax revenues in 2011 totalled 324 million CZK (€13.2 million), equivalent to 0.0036% of GDP.[807]
- A landfill tax was established in 1992.[808,809] There are two components to the tax: 1) a basic charge with a tax rate of 500 CZK (€19.91) per tonne for municipal other wastes and 1,700 CZK (€67.69) per tonne for hazardous waste; and 2) a 'risk charge' of 4,500 CZK (€179.19), which is paid only on hazardous waste. The basic rate of tax is paid directly to municipalities, whilst the risk charge is paid to the State Environmental Fund. A payment of 21% VAT is also required on the basic rate for waste streams other than municipal waste which is subject to a reduced rate (15% VAT). In 2011, revenues from both the basic and risk charges were CZK 1,817 million (€74 million), equivalent to 0.048% of GDP.[810]

A.8.4 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 9.2.2, we list here a complete list of subsidies identified in the Czech Republic by the IEEP for which financial information is not available.

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[805] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

[806] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[807] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

[808] ETC/SCP (2013) Overview of the use of Landfill Taxes in Europe, April 2012, p.25, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1

[809] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[810] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

Table 172: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
Indirect subsidies on material extraction	IEEP	The level of taxes and charges on aggregate materials extraction is low (3% in 2008). For this reason, the purchase of recycled materials may be less attractive than virgin materials.
A 15% reduced VAT rate for drinking water	IEEP	
Subsidies for the construction of waste incineration plants	IEEP	May not promote a shift up the waste hierarchy.
Nuclear energy: Limited liability for nuclear operators/producers	IEEP	Operators are only obliged to cover €250 million of the potential cost of a nuclear accident.

Sources: See Table 4 in IEEP (2013) Steps to Greening Country Report: Czech Republic, Report for the European Commission, pp.13-14

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 173.

Table 173: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (CZK million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for electricity used for rail transport	TAXUD	Electrical Energy - Transport - Railways	1,156	GWh	1,156,000	MWh	1.13	0	32.1

Sources: Source: Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

A.8.5 Change in Tax Bases

Table 174: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	4,727	4,631	-95
Petrol	million litres	2,306	2,306	0
Kerosene	million litres	434	434	0
LPG	thousand tonnes	75	61	-15
Heavy Fuel Oil	thousand tonnes	89	85	-3
Natural Gas	TJ (GCV)	175,652	169,795	-5,857
Coal	thousand tonnes	2,172	1,987	-185
Electricity	GWh	57,699	57,699	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[811] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[811] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 102: Change in Internal Passenger Flights, flights per year

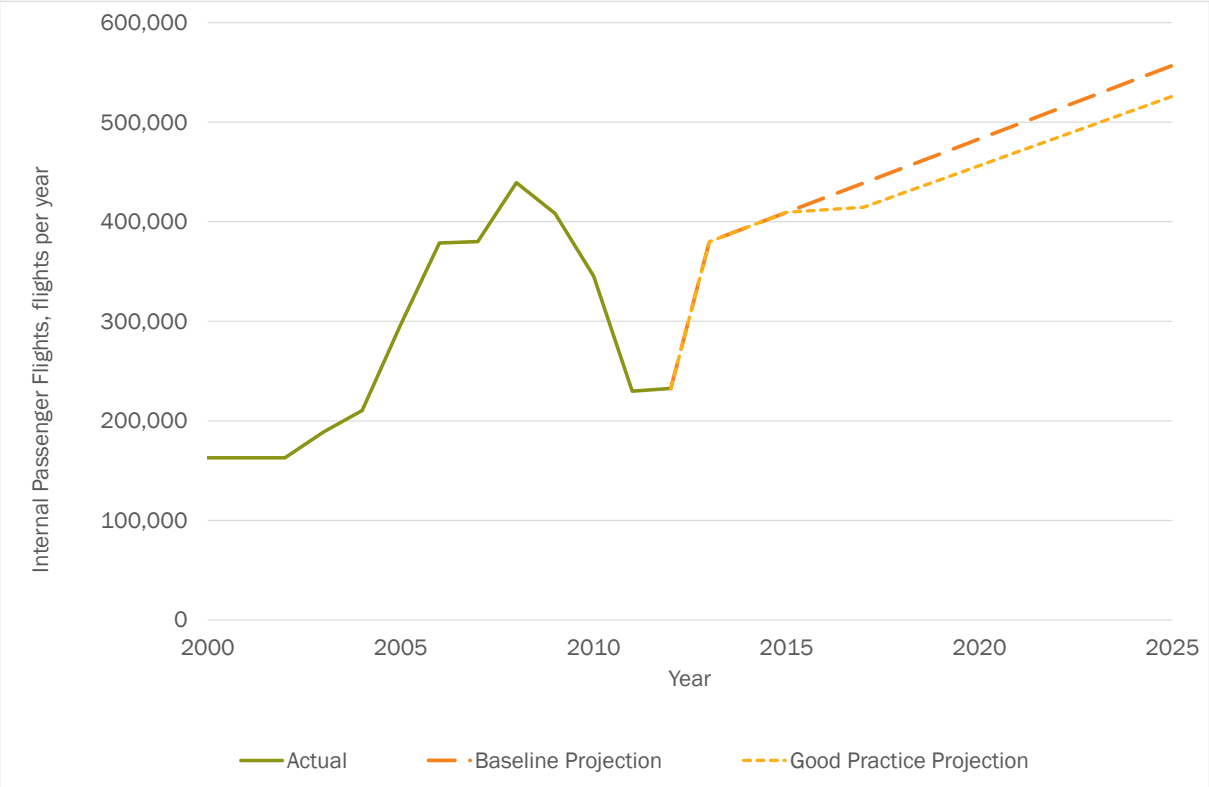


Figure 103: Change in Intra-EU Passenger Flights, flights per year

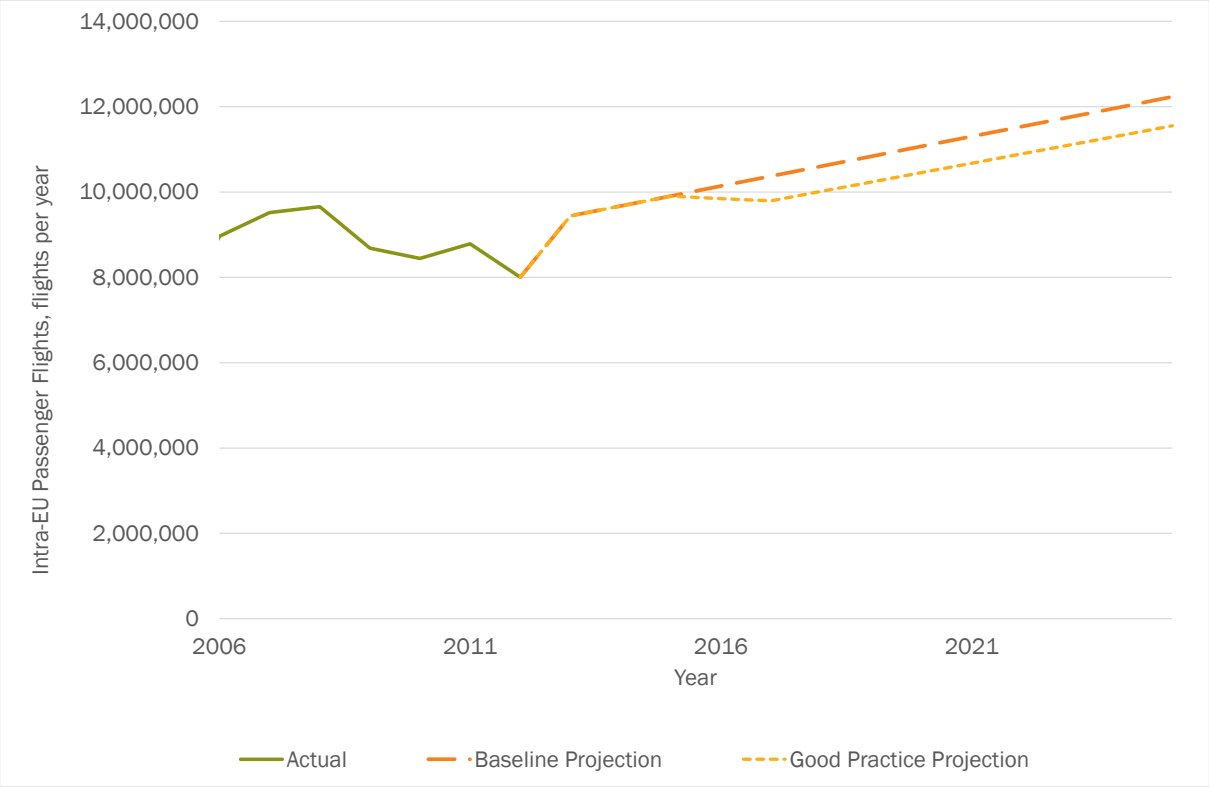


Figure 104: Change in Extra-EU Passenger Flights, flights per year

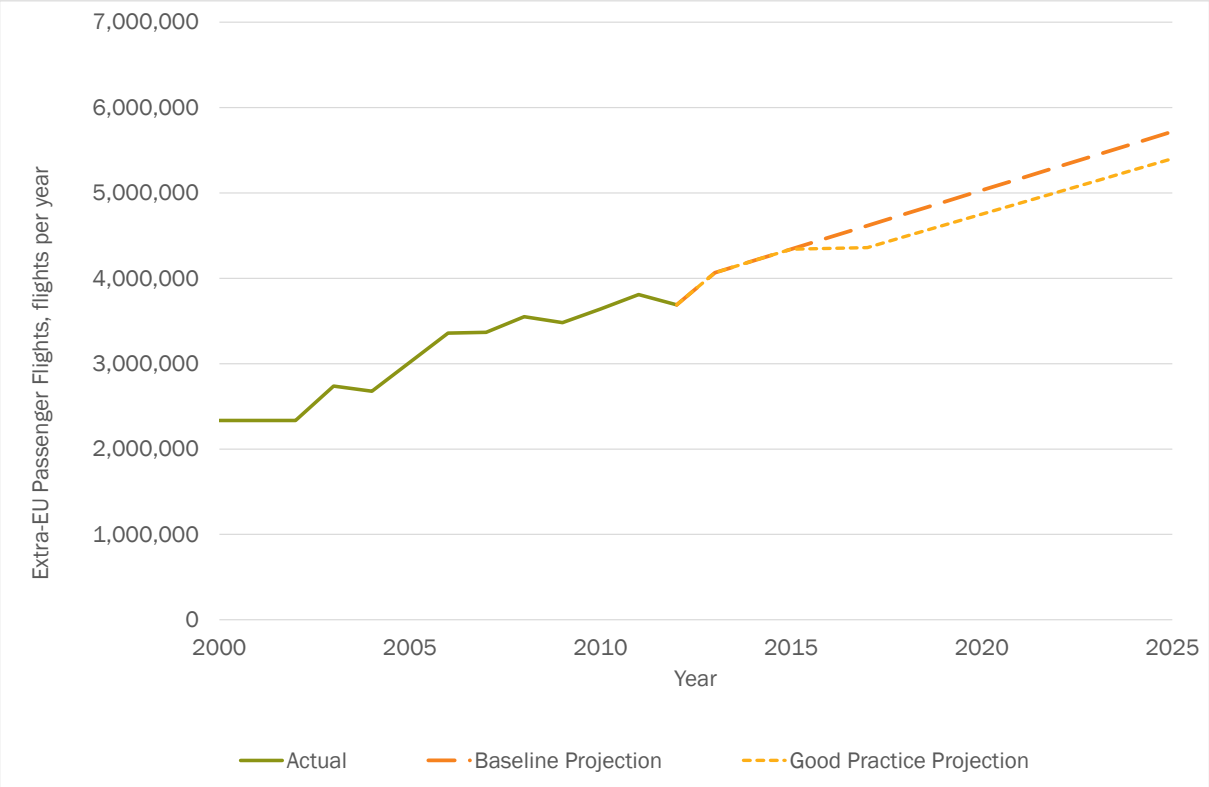


Figure 105: Change in Internal Air-freight, tonnes

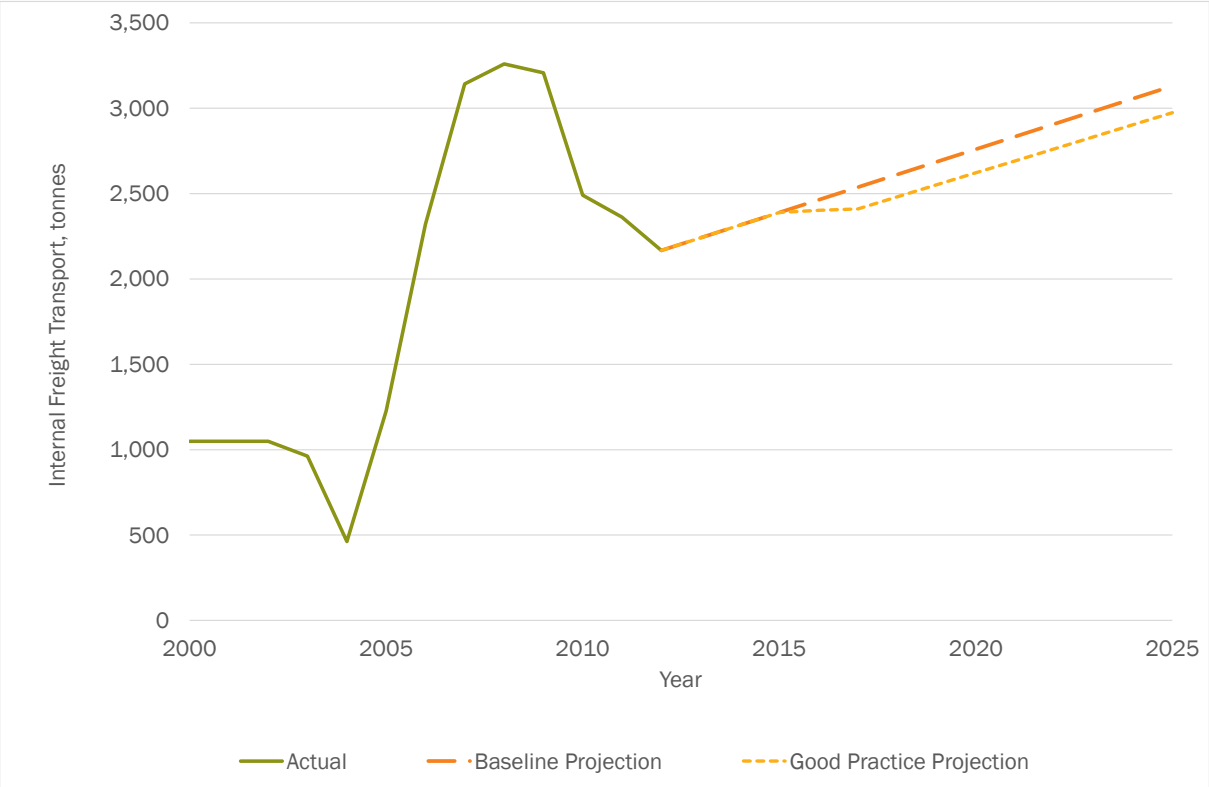


Figure 106: Change in Intra-EU Air-freight, tonnes

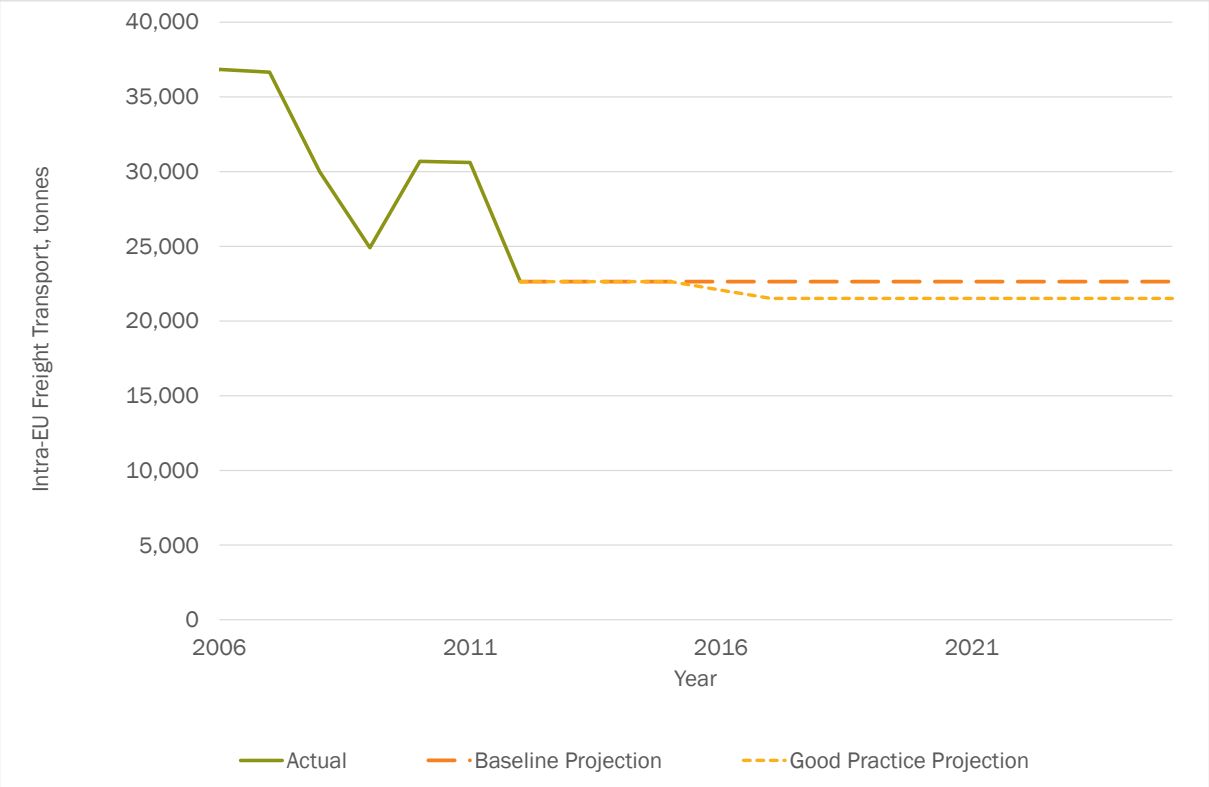


Figure 107: Change in Extra-EU Air-freight, tonnes

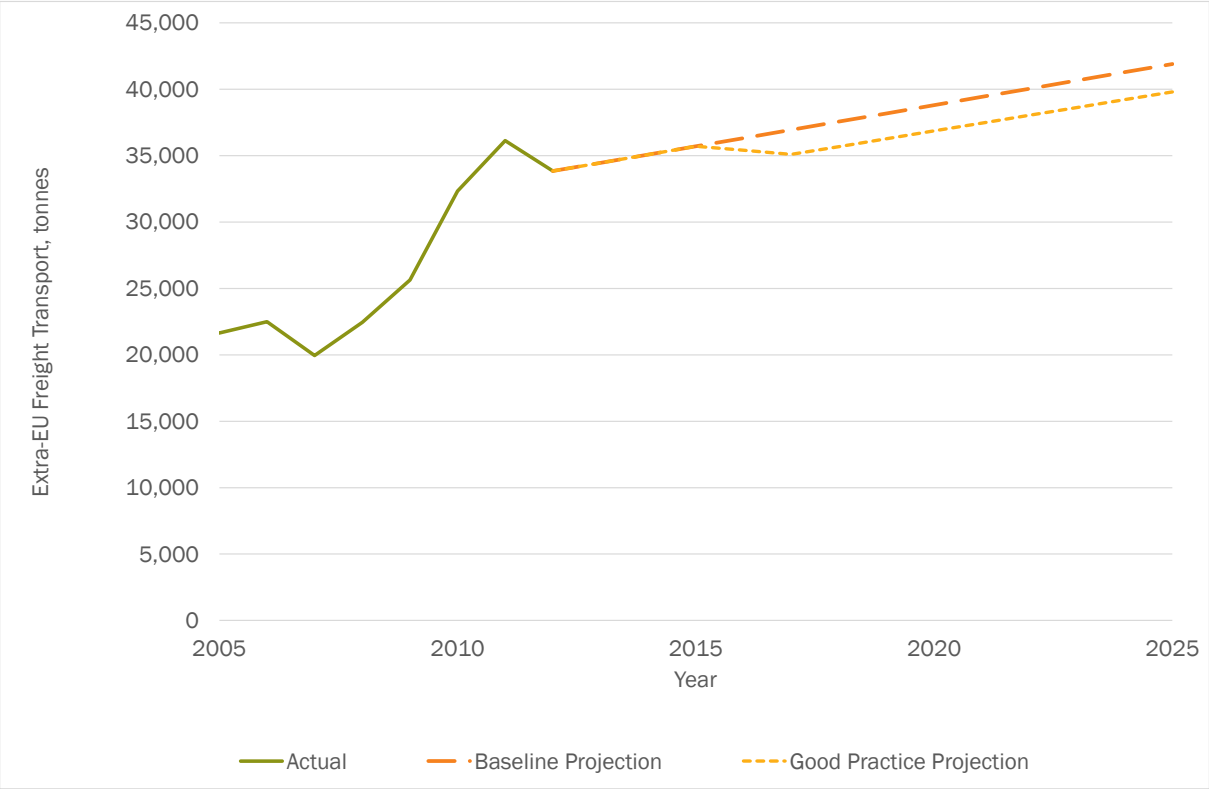


Figure 108: Change in Non-Hazardous Waste Landfilled, thousand tonnes

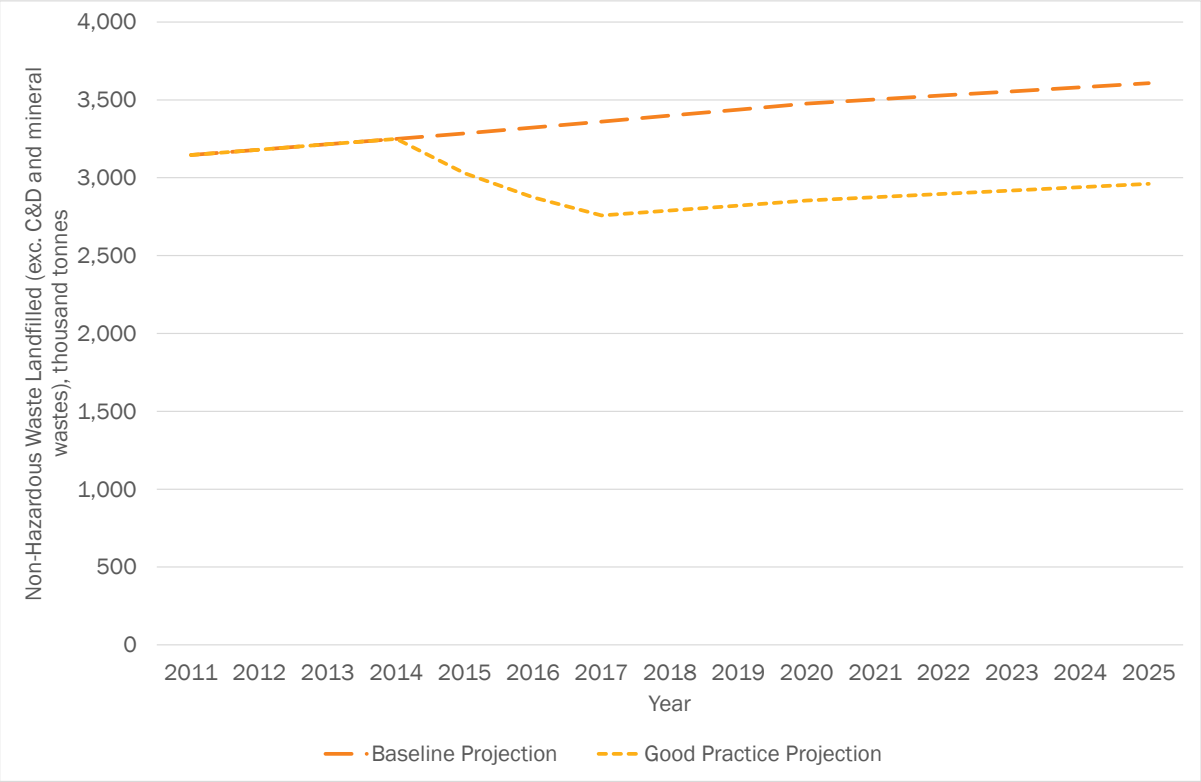


Figure 109: Change in MBT/ Incineration, thousand tonnes

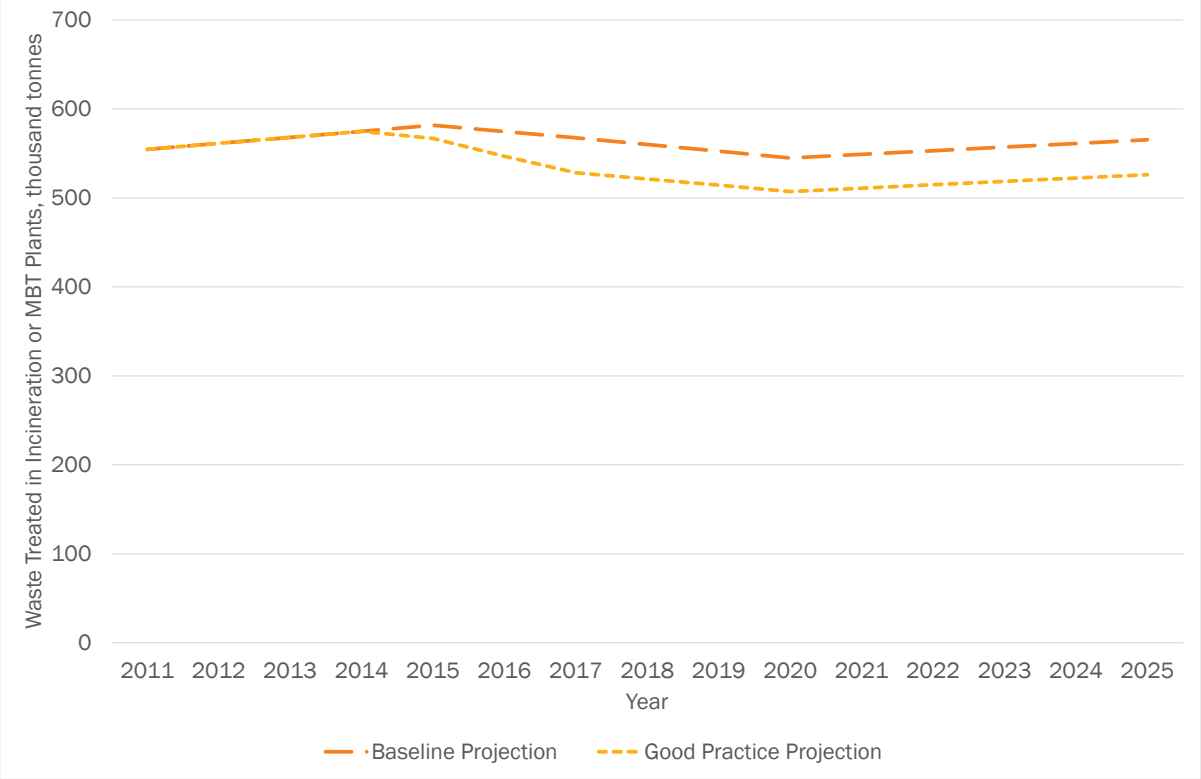


Figure 110: Change in SOx Emissions, tonnes

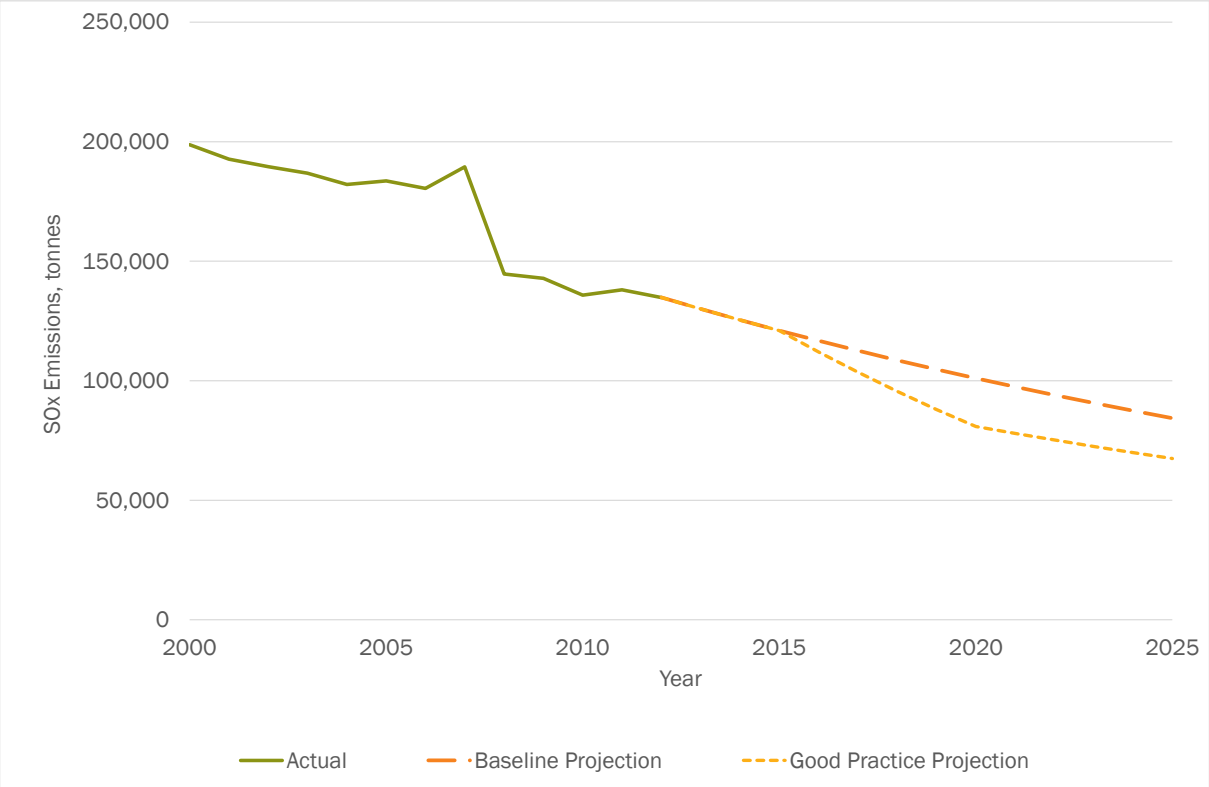


Figure 111: Change in NOx Emissions, tonnes

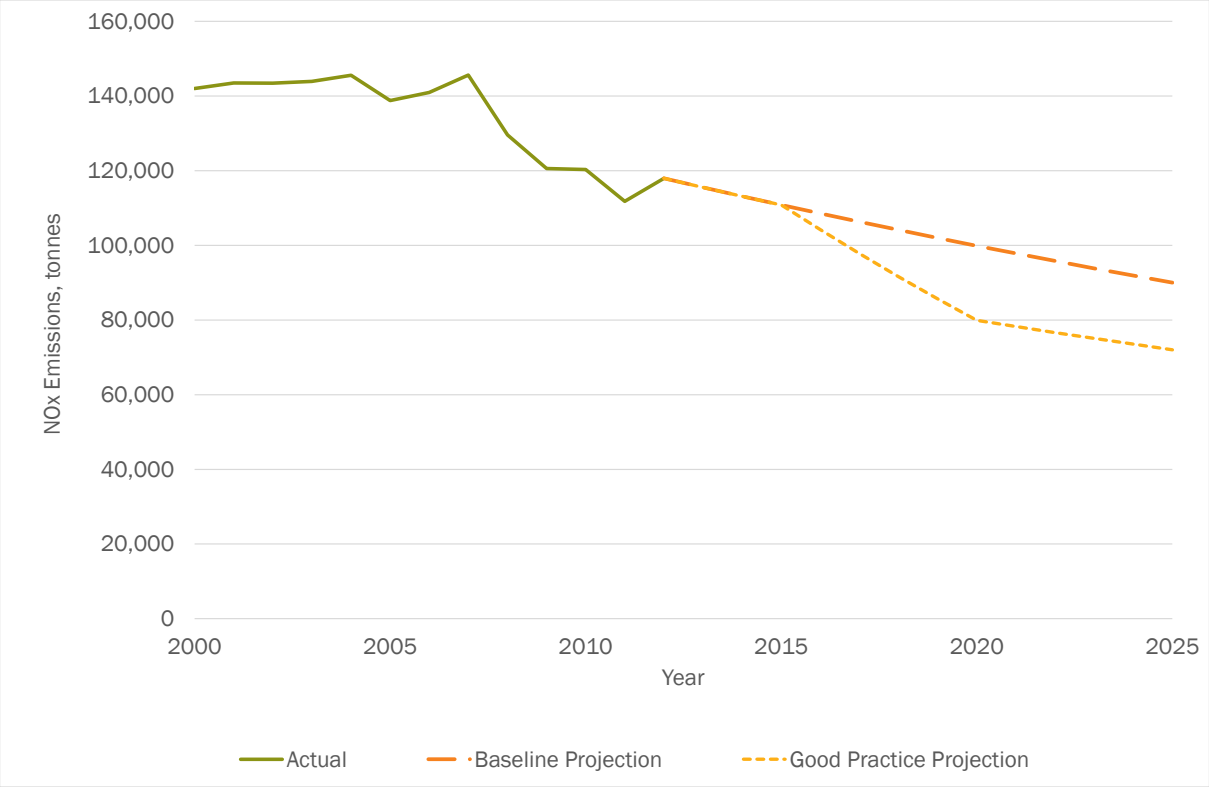


Figure 112: Change in PM_{10} Emissions, tonnes

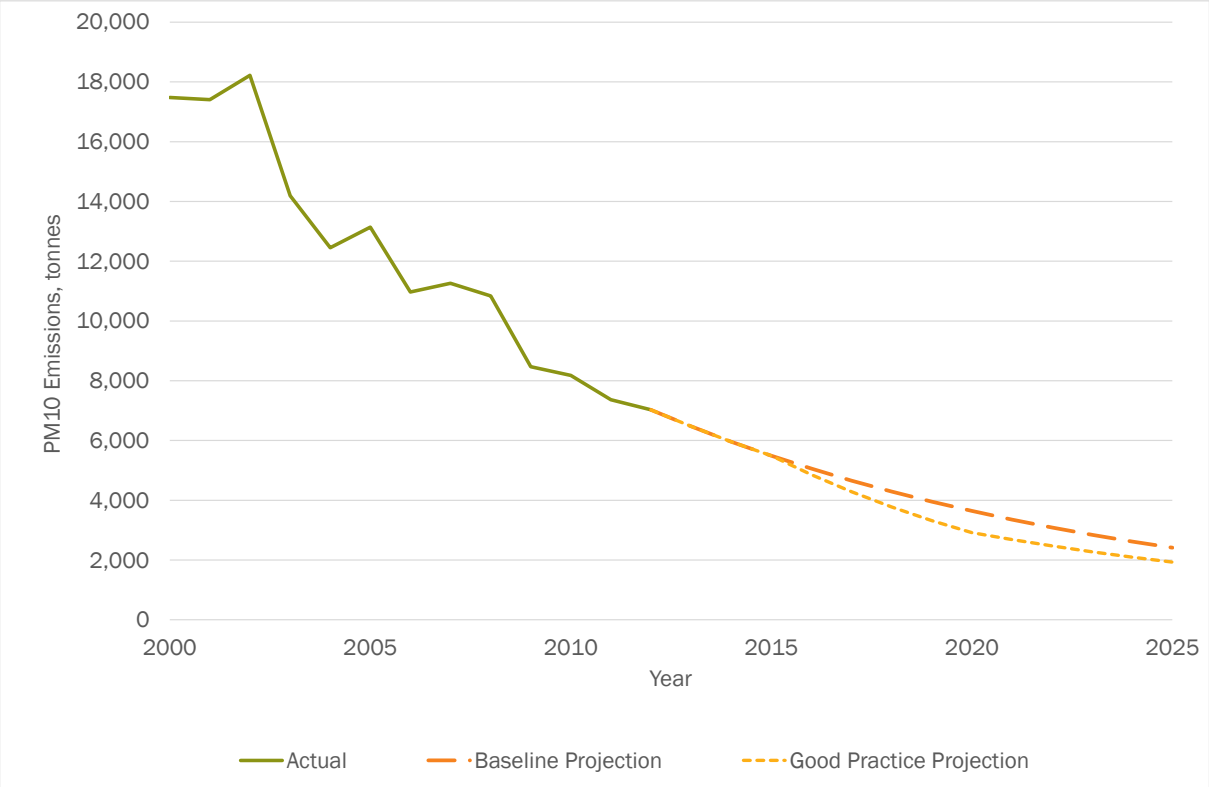


Figure 113: Change in Groundwater Abstraction – Public Supply, million cubic metres

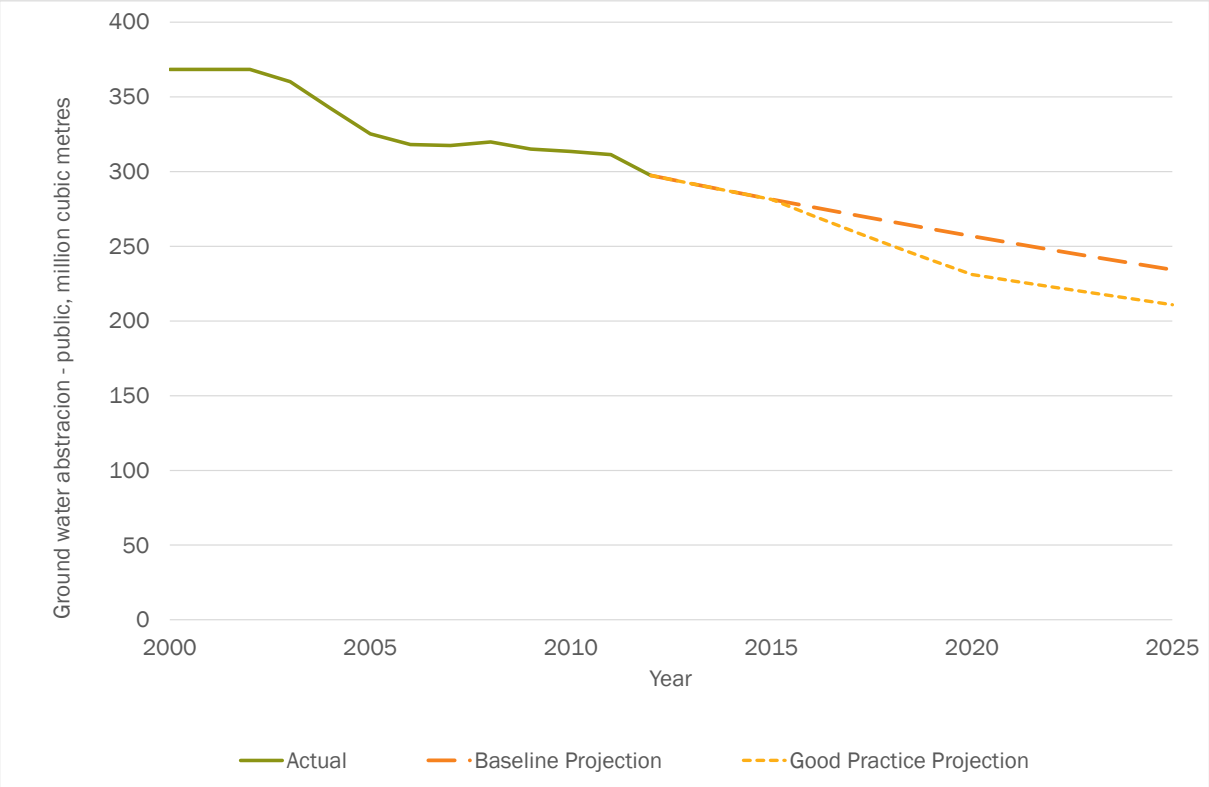


Figure 114: Change in Groundwater Abstraction – Manufacturing, million cubic metres

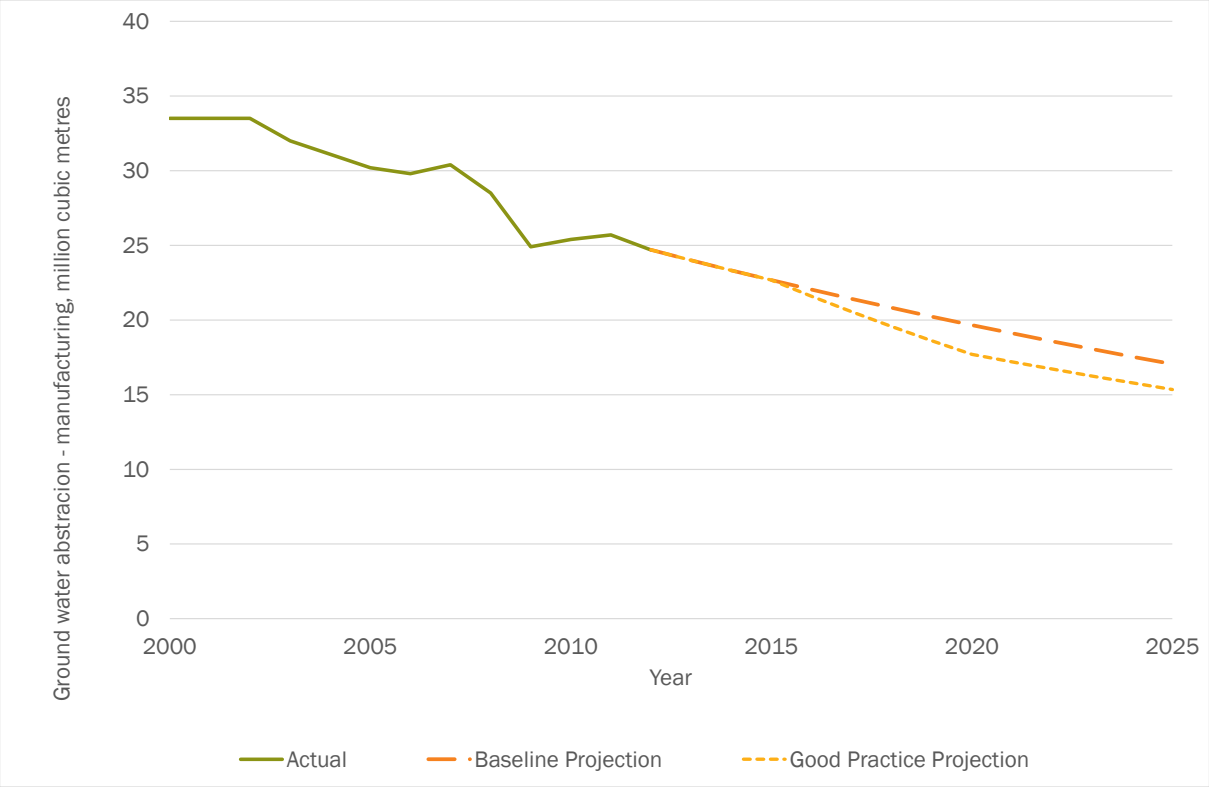


Figure 115: Change in Groundwater Abstraction – Agriculture, million cubic metres

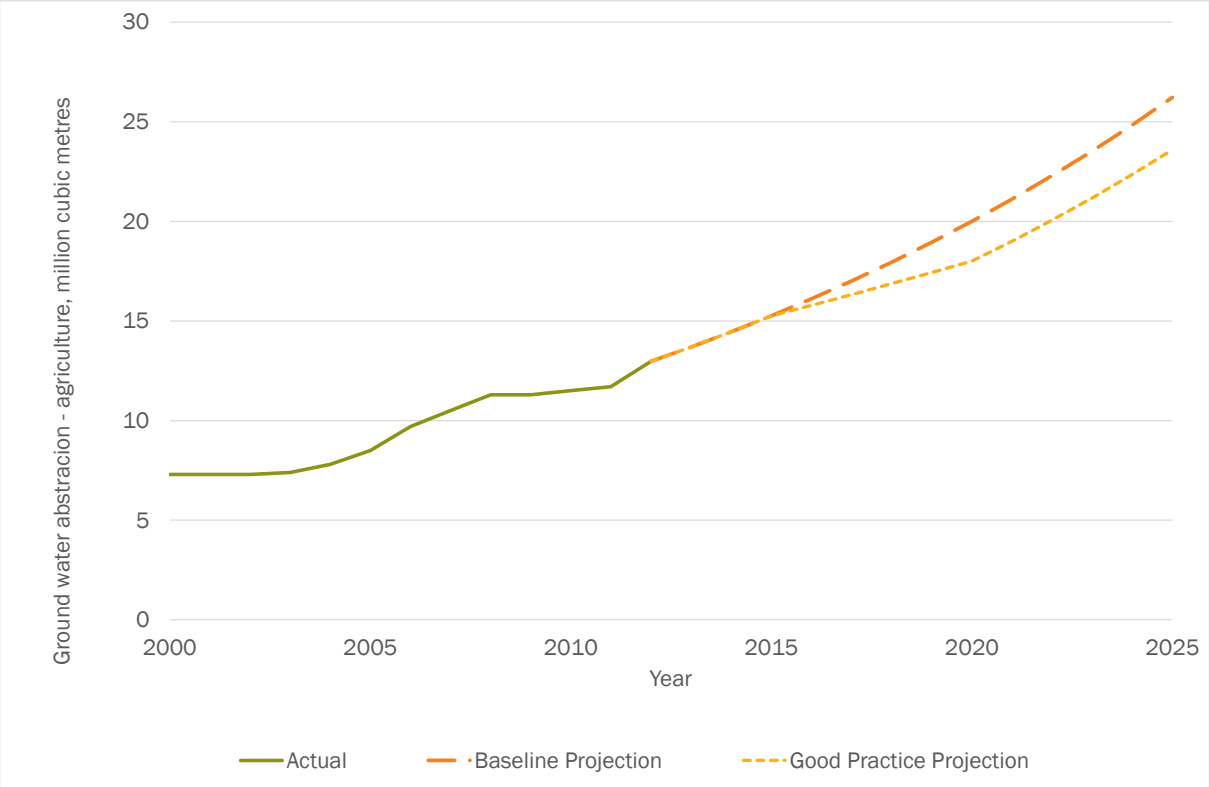


Figure 116: Change in Surface Water Abstraction – Public Supply, million cubic metres

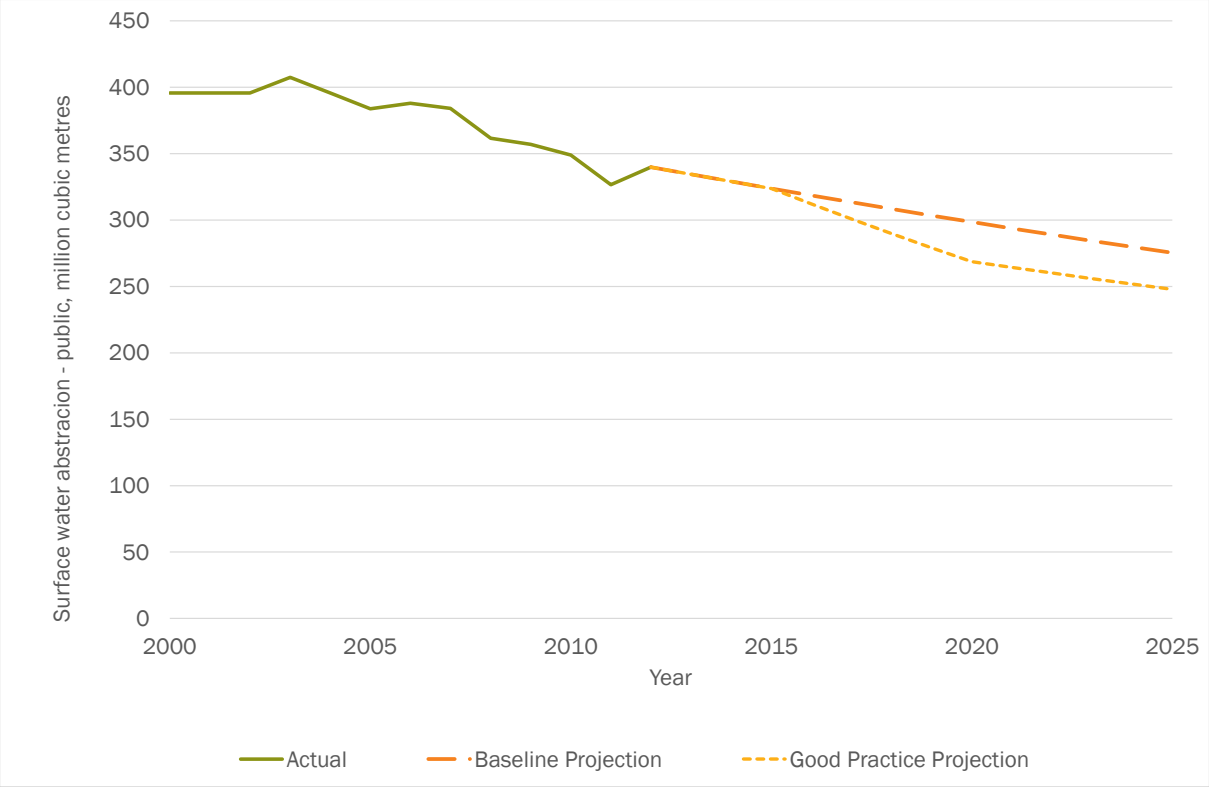


Figure 117: Change in Surface Water Abstraction – Manufacturing, million cubic metres

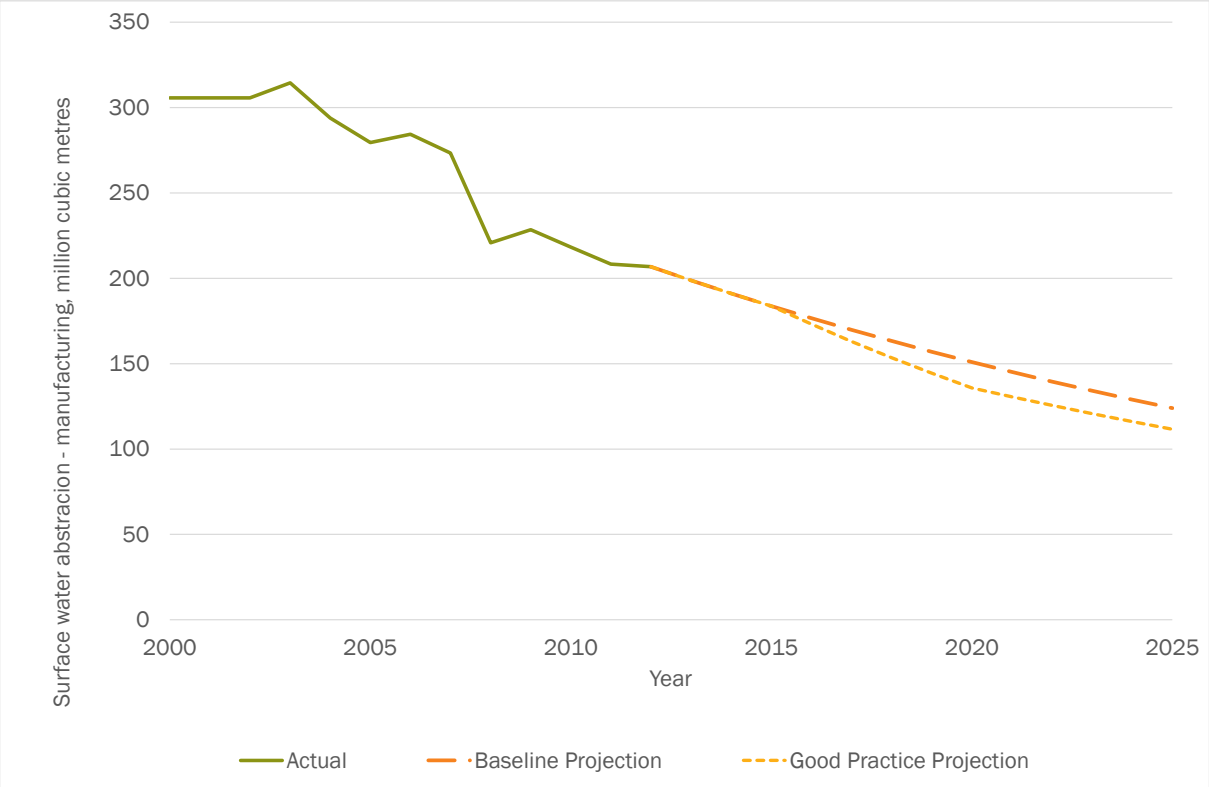


Figure 118: Change in Surface Water Abstraction – Agriculture, million cubic metres

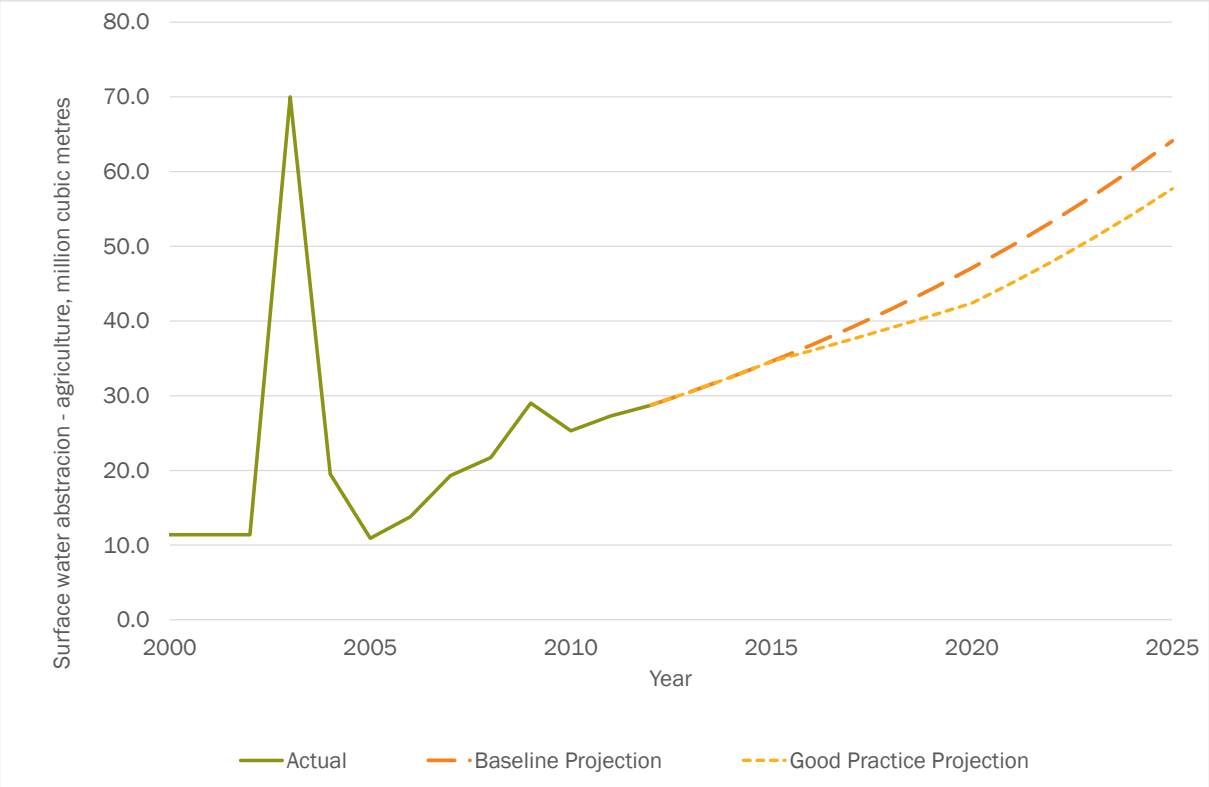


Figure 119: Change in Active Ingredients in Pesticides, tonnes

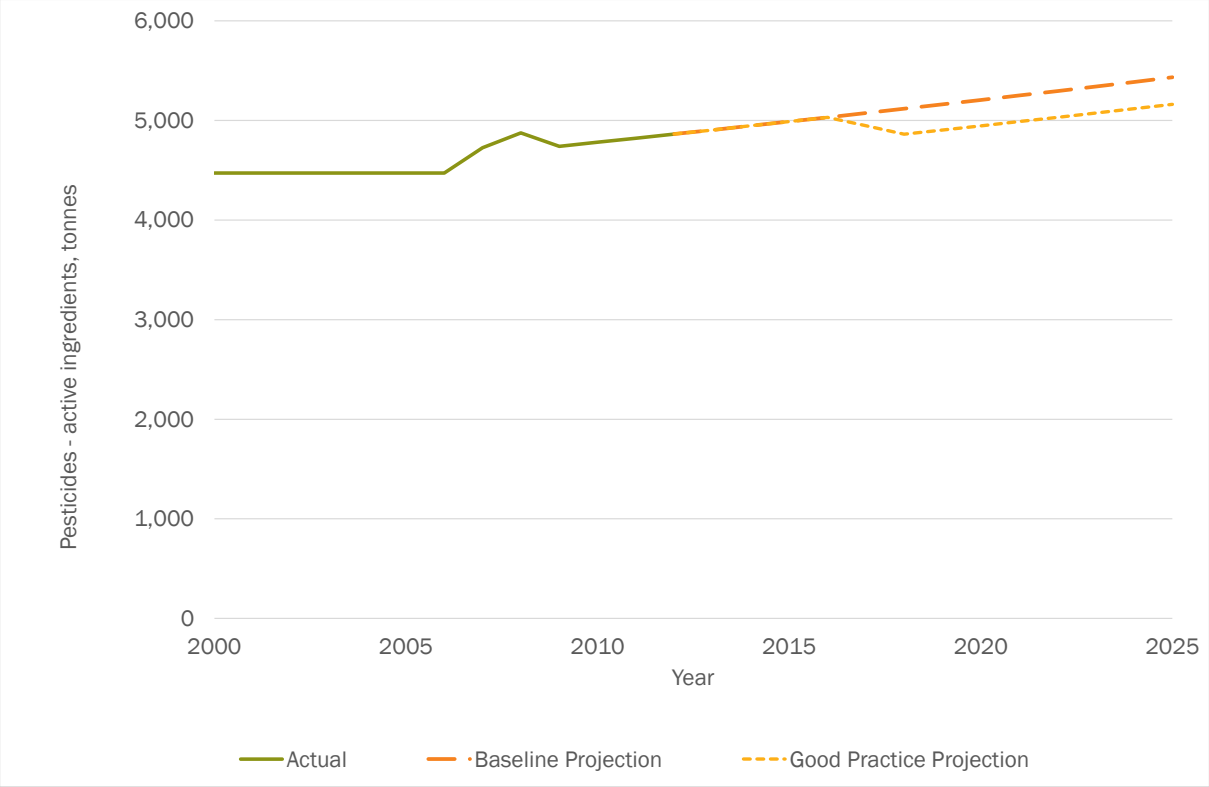


Figure 120: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

Figure 121: Change in Aggregates Extraction, thousand tonnes

Figure 122: Change in Paper & Card Packaging Generation, thousand tonnes

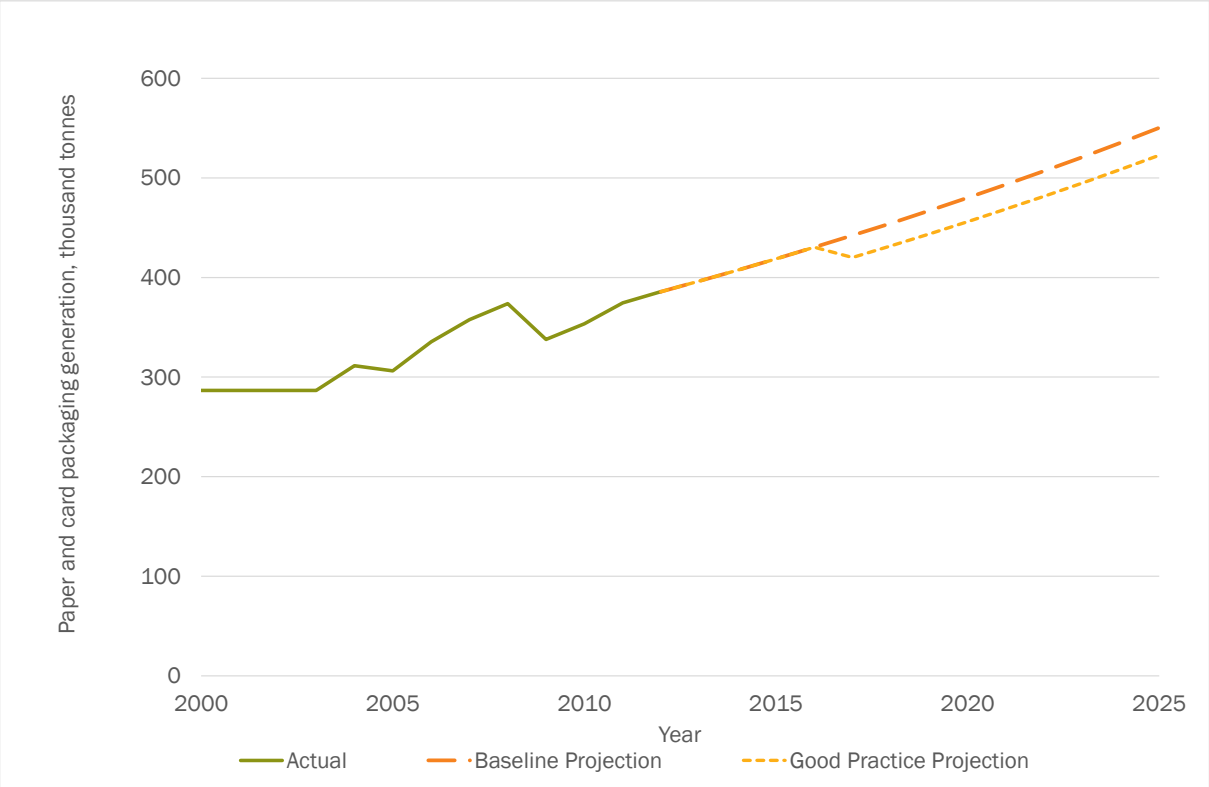


Figure 123: Change in Plastic Packaging Generation, thousand tonnes

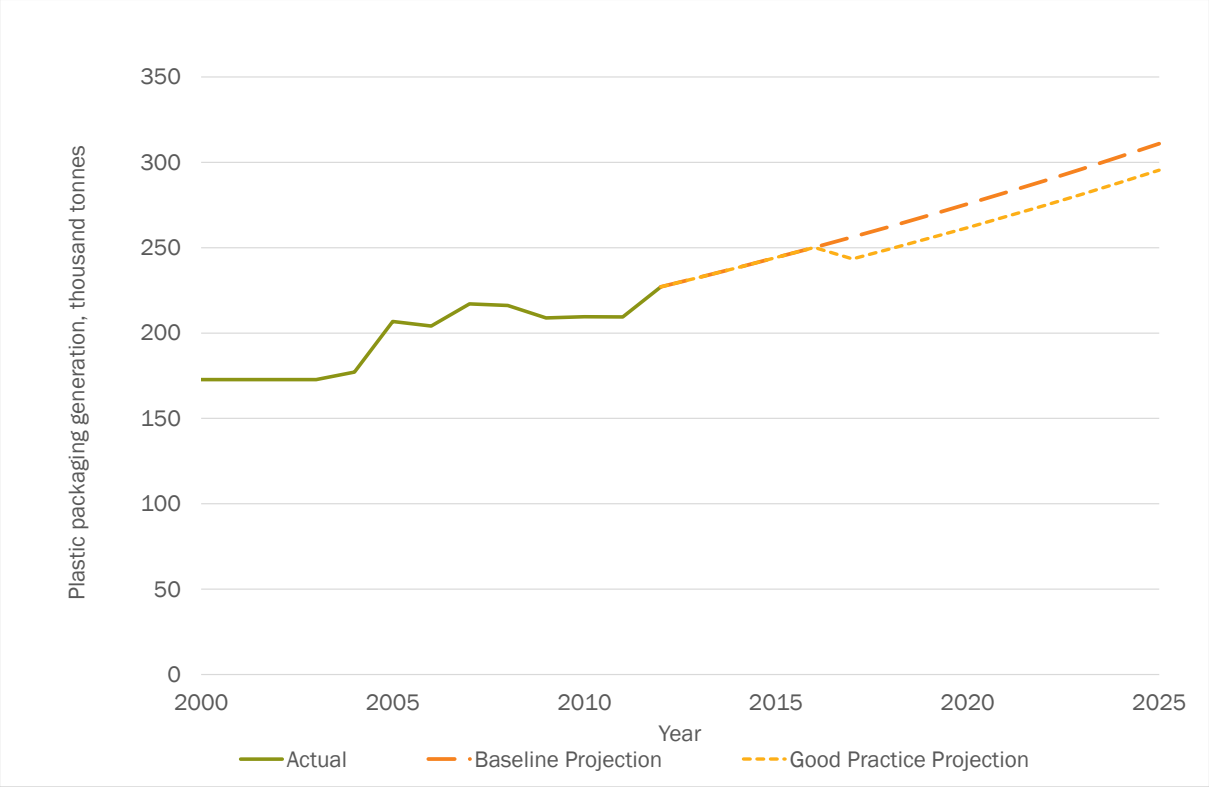


Figure 124: Change in Wood Packaging Generation, thousand tonnes

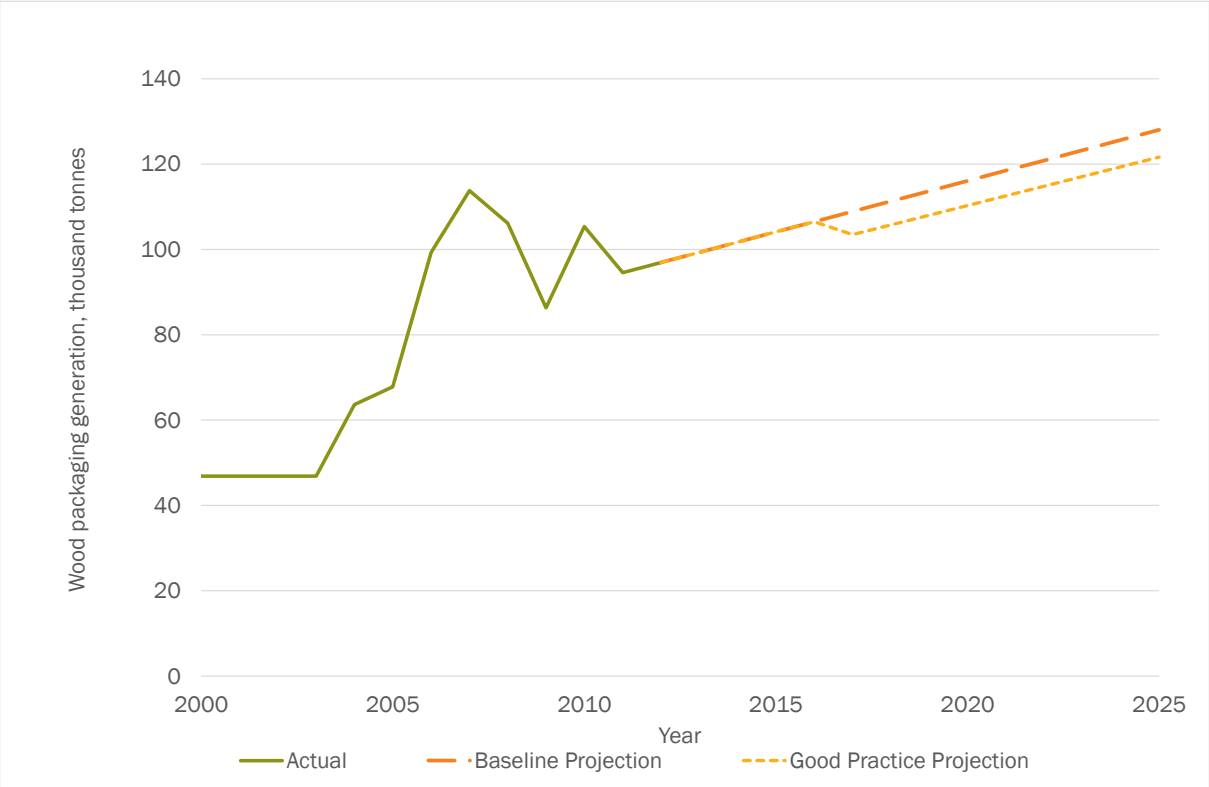


Figure 125: Change in Metal Packaging Generation, thousand tonnes

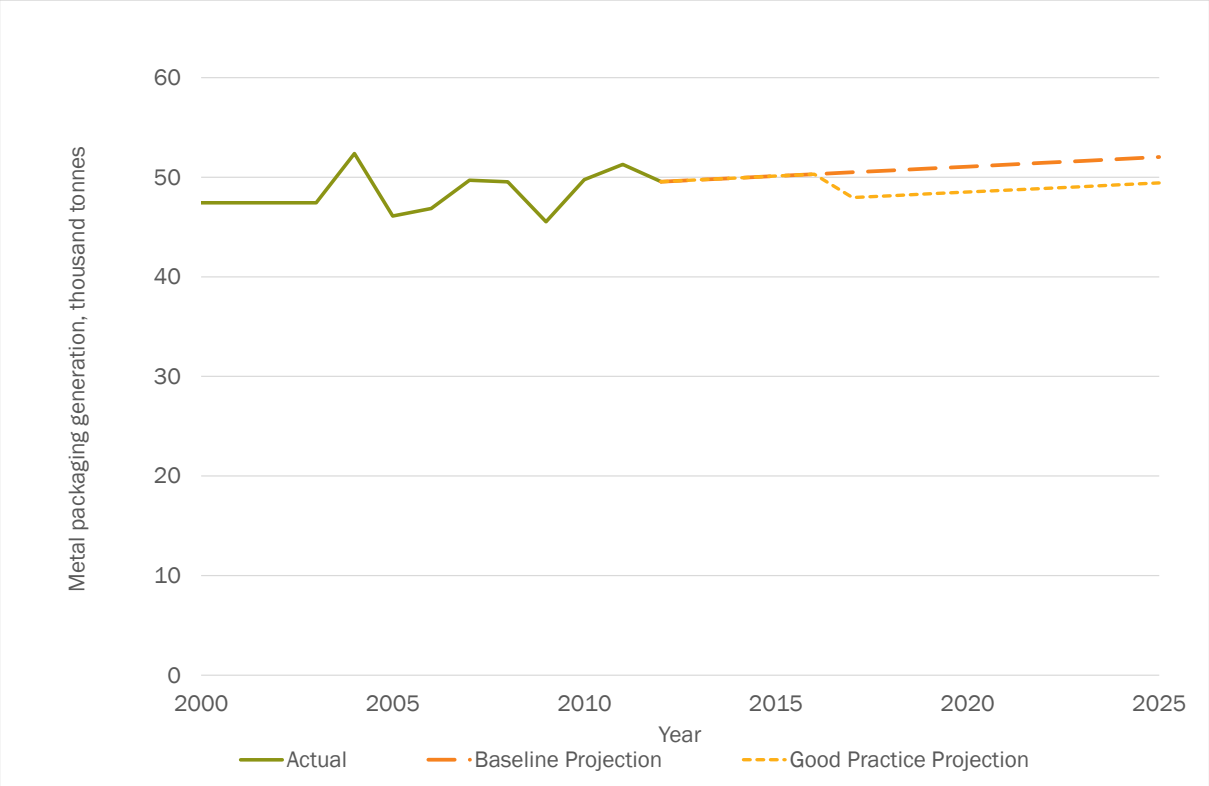


Figure 126: Change in Glass Packaging Generation, thousand tonnes

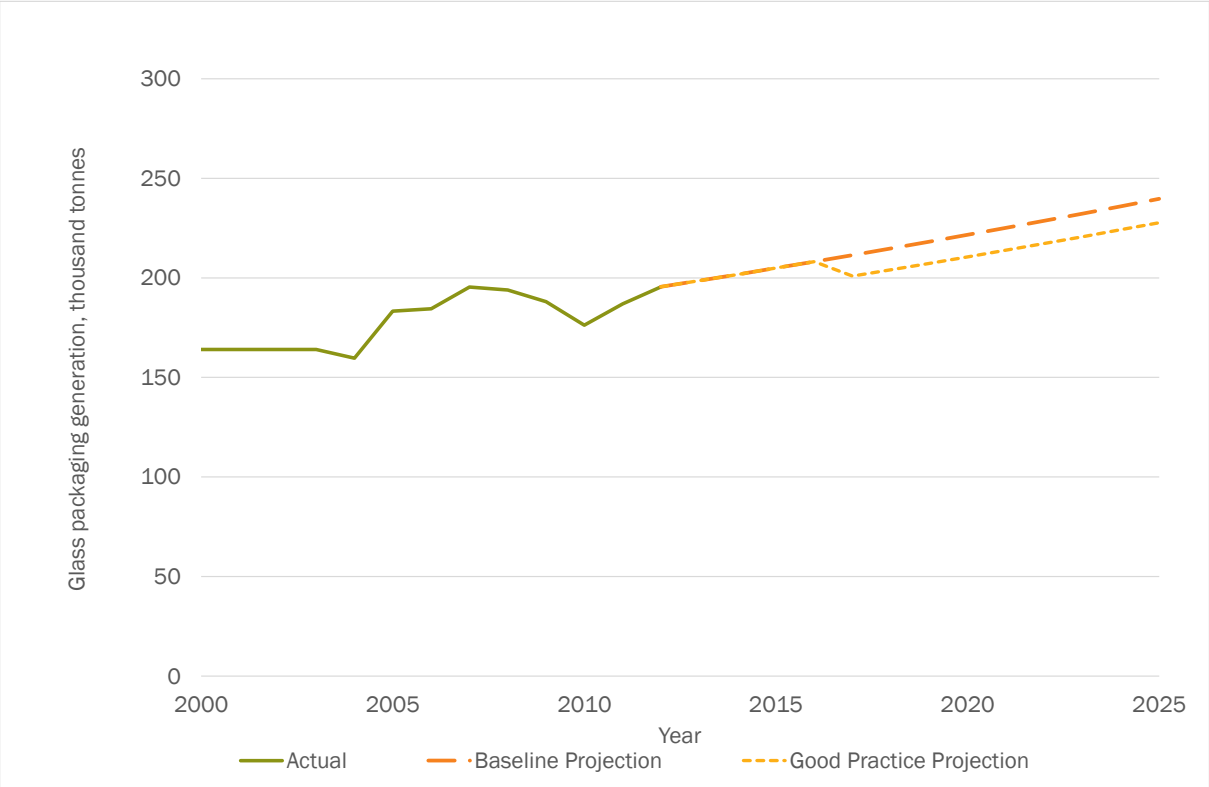
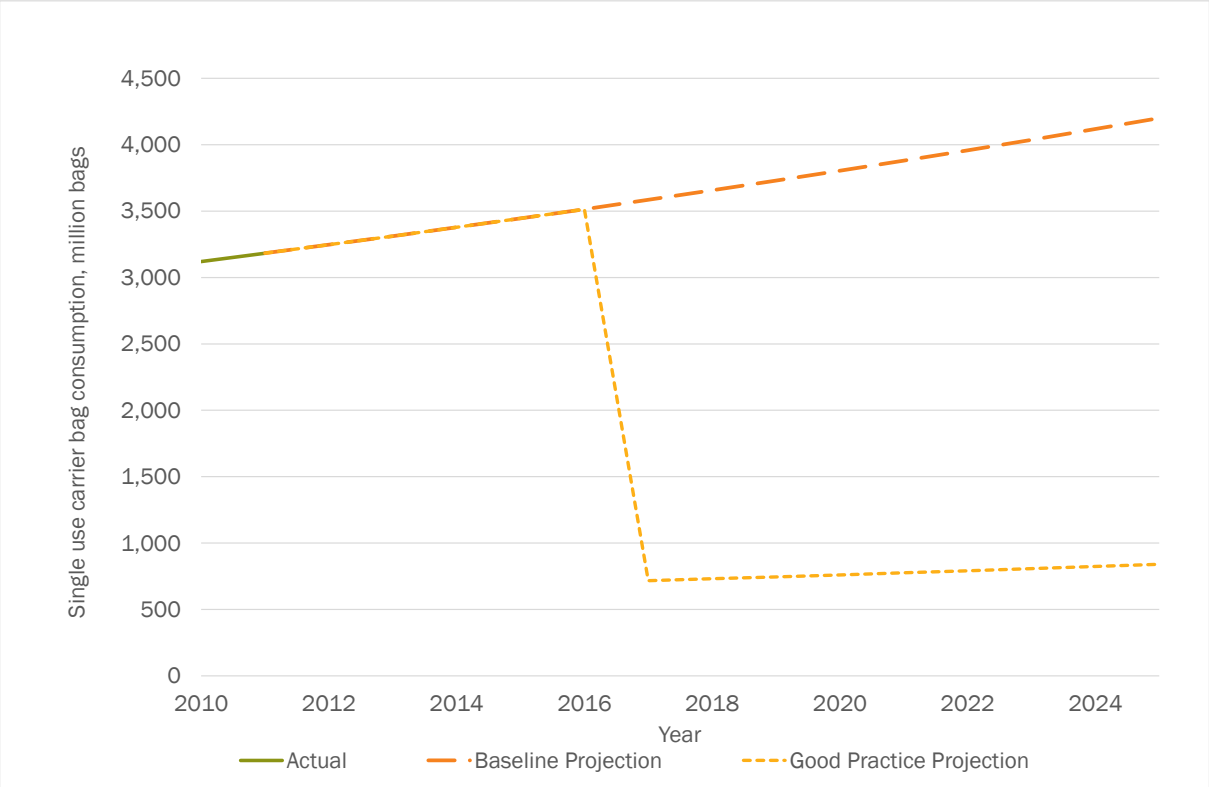


Figure 127: Change in Consumption of Single Use Carrier Bags, million bags



A.8.6 Full Revenue Outputs

Table 175: Revenue Outturns from Model, million CZK (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	1,819	3,614	5,387	7,141	8,879	10,601	12,309	14,005	14,005	14,005
	C&I / Heating	0	0	2,204	4,334	6,398	6,398	6,398	6,398	6,398	6,398	6,398	6,398
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million CZK	*0*	*0*	*4,024*	*7,948*	*11,785*	*13,539*	*15,277*	*16,999*	*18,708*	*20,403*	*20,403*	*20,403*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	2,324	4,710	7,158	9,669	12,888	13,172	13,462	13,758	14,061	14,370
	Passenger Aviation Tax	0	0	6,465	12,910	13,246	13,581	13,917	14,253	14,589	14,925	15,261	15,597
	Freight Aviation Tax	0	0	1.03	2.03	2.05	2.08	2.10	2.12	2.14	2.17	2.19	2.21
	Sub-total Transport, million CZK	*0*	*0*	*8,790*	*17,621*	*20,405*	*23,253*	*26,808*	*27,427*	*28,053*	*28,685*	*29,323*	*29,969*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.4%*	*0.5%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	756	1,455	2,115	2,139	2,164	2,188	2,204	2,221	2,237	2,254	2,270
	Landfill Tax - Inerts (C&D)	0	6	11	15	14	12	10	10	10	10	10	10
	Incineration /MBT Tax	0	78	150	218	215	212	209	211	213	214	216	217
	Air Pollution Tax	0	1,275	2,361	3,284	4,057	4,691	4,322	4,194	4,070	3,950	3,834	3,723
	Water Abstraction Tax	0	366	687	977	1,239	1,474	1,393	1,358	1,324	1,291	1,259	1,227
	Waste Water Tax	0	251	486	703	678	678	678	678	678	678	678	678
	Pesticides Tax	0	0	519	1,021	1,004	1,012	1,021	1,030	1,038	1,047	1,056	1,065
	Aggregates Tax	0	0	5,778	5,285	4,775	4,247	3,700	3,761	3,822	3,885	3,949	4,014
	Packaging Tax	0	0	935	907	927	947	968	989	1,011	1,033	1,055	1,079
	Single Use Bag Tax	0	6,675	6,808	1,389	1,417	1,445	1,474	1,503	1,533	1,564	1,595	1,627
	Fertiliser Tax	0	0	1	1	1	1	2	2	2	2	2	2
	Sub-total Pollution & Resource, million CZK	*0*	*9,407*	*19,190*	*15,918*	*16,467*	*16,885*	*15,965*	*15,940*	*15,923*	*15,912*	*15,909*	*15,913*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.2%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*
	Total, million CZK	0	9,407	32,004	41,487	48,658	53,677	58,050	60,367	62,683	65,001	65,636	66,285
	Total, % GDP	0.0%	0.2%	0.7%	0.9%	1.1%	1.2%	1.2%	1.2%	1.3%	1.3%	1.3%	1.3%

A.9.0 Estonia: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

The information below presentments a detailed summary of the existing environmental taxes in Estonia.

A.9.1 Energy

- Fuel excise duty:
  - Rates: see Table 176 for details of rates.[812]
  - Main exemptions:
    - Energy products not intended for use as a motor or heating fuel;
    - Energy products used for air navigation in aircraft operated for commercial purposes; and
    - Shale derived fuel oil.[813]
  - Revenue in 2012: €393.5 million (equivalent to 2.3% of GDP).[814]
- Electricity excise duty:

[812] European Commission - Taxation and Customs Union (2013) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2013, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[813] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[814] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholom Environment Institute Tallinn Centre, Estonia

- Rate: (€4.47/MWh for domestic and business consumers.[815]
- Main exemptions:
    - Electricity used for certain industrial processes;
    - Electricity when it accounts for more than 50% of the cost price of a product; and
    - Electricity use in power plants to produce electrical energy.[816]
- Revenue in 2012: €33 million (equivalent to 0.2% of GDP).[817]

Table 176: Details on Energy Excise Duties (Estonia, 2013)[818]

General Tax Base	Specific Tax Base	Tax Rate (€)
Petrol (per 1,000 litres)	Leaded	422.77
	Unleaded	422.77
Gas oil (per 1,000 litres)	Propellant use	392.92
	Industrial/Commercial use	110.95
	Heating - Business use	110.95
	Heating - Non-business use	110.95
Kerosene (per 1,000 litres)	Propellant use	330.10
	Industrial/Commercial use	330.10
	Heating - Business use	330.10
	Heating - Non-business use	330.10
Heavy fuel oil (per 1,000 kg)	Heating - Business use	15.01
	Heating - Non-business use	15.01
Liquid Petroleum Gas (LPG) (per 1,000 kg)	Propellant use	125.26
	Industrial/Commercial use	125.26

[815] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

[816] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[817] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

[818] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

General Tax Base	Specific Tax Base	Tax Rate (€)
Natural Gas (per gigajoule)	Heating - Business use	0.70
	Heating - Non-business use	0.70
Coal (per 1,000 kg)	Heating - Business use	0.30
	Heating - Non-business use	0.30
Coke (per 1,000 kg)	Heating - Business use	0.30
	Heating - Non-business use	0.30
Oil shale (per 1,000 kg)	Heating - Business use	0.30
	Heating - Non-business use	0.30
Electricity (per MWh)	Business use	4.47
	Non-business use	4.47

A.9.2 Transport (excl. transport fuels)

- Registration:
  - Vehicle registration tax:
    - Tax rate: €121.43 for the registration of a personal vehicle.
    - Some vehicle types (e.g. all-terrain vehicles and mopeds) are taxed at different rates (see Table 177).[819]
    - Revenue in 2012: €6.9 million (equivalent to 0.04% of GDP).[820]

Table 177: Vehicle Registration Taxes (Estonia, 2013)

Vehicle	Tax Rate (€)
'Vehicle'	121.43
Recreational craft or a ship with an overall length of less than 12 metres	63.91
All-terrain vehicle or jet bike	63.91

[819] Data obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia, sourced from the National Road Administration

[820] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

Temporarily imported vehicle	319.55
Moped	9.58

- Circulation:
  - Tax on heavy goods vehicles:
    - Paid quarterly for the following classes of vehicles which are intended for the transport of goods:
      - Trucks with a maximum authorised weight, or gross laden weight, of not less than 12 tonnes which are registered in the traffic register except for some specified trucks.
      - Road trains composed of trucks and one or more trailers with a maximum authorised weight or gross laden weight of not less than 12 tonnes, whereas the trucks of the road trains must be registered in the traffic register.
    - Tax rates (2012) are shown in Table 178.[821]
    - Revenue in 2012: €3.9 million (equivalent to 0.02% of GDP).[822]

Table 178: Details on Heavy Vehicle Tax (Estonia, 2012)

Category of Vehicle	Maximum Authorised Weight (tonnes)	Tax Rate (€ per quarter)	
		Air or Equivalent Suspension	Other Type of Suspension
Lorry			
2 axles	12 – 13	0.00	7.98
	13 – 14	7.98	21.70
	14 – 15	21.70	30.30
	15 and above	30.30	68.70
3 axles	12 – 15	0.00	0.00

[821] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

[822] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

Category of Vehicle	Maximum Authorised Weight (tonnes)	Tax Rate (€ per quarter)	
		Air or Equivalent Suspension	Other Type of Suspension
	15 – 17	7.90	13.70
	17 – 19	13.70	28.10
	19 – 21	28.10	36.10
	21 – 23	36.10	55.90
	23 and above	55.90	86.30
4 axles	12 – 23	0.00	0.00
	23 – 25	36.10	36.70
	25 – 27	36.70	57.00
	27 – 29	57.00	90.50
	29 and above	90.50	134.30
Road Train (Truck and Trailer)			
2+1 axles	12 – 16	0.00	0.00
	16 – 18	0.00	3.50
	18 – 20	3.50	8.00
	20 – 22	8.00	18.80
	22 – 23	18.80	24.30
	23 – 25	24.30	44.00
	25 and above	44.00	76.80
2+2 axles	12 – 23	0.00	0.00
	23 – 25	7.50	17.50
	25 – 26	17.50	28.80
	26 – 28	28.80	42.50
	28 – 29	42.50	51.10
	29 – 31	51.10	84.00

Category of Vehicle	Maximum Authorised Weight (tonnes)	Tax Rate (€ per quarter)	
		Air or Equivalent Suspension	Other Type of Suspension
	31 – 33	84.00	116.60
	33 and above	116.60	176.70
2+3 axles	12 – 36	0.00	0.00
	36 – 38	92.60	128.80
	38 and above	128.80	175.10
3+2 axles	12 – 36	0.00	0.00
	36 – 38	81.80	113.50
	38 – 40	113.50	157.50
	40 and above	157.50	232.60
3+3 or more axles	12 – 36	0.00	0.00
	36 – 38	46.50	56.30
	38 – 40	56.30	84.00
	40 and above	84.00	133.80

A.9.3 Pollution and Resources

Total revenue from air and water pollution and waste disposal fees in 2012 was €31.7 million (equivalent to 0.2% of GDP).[823] The contribution from each of the components listed below is not clear (the figures are given in the aggregate). The tax rates applicable from 2011 to 2015 are shown in the Tables below.

- Water Pollution fee:
  - Pollution charge rates upon discharging one tonne of pollutant into a water body, groundwater or soil are shown in Table 179.[824]

[823] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

[824] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

Table 179: Pollution Charge Rates for the Discharge of Pollutants into Water Bodies (Estonia, 2012-2015)

Pollutant	Charge (€ per tonne)				
	2011	2012	2013	2014	2015
Organic matter[1]	1,379	1,392	1,406	1,420	1,435
Phosphorous compounds, calculated as total phosphorus (Ptot)	4,206	5,468	7,109	9,241	12,014
Nitrogen oxides	1,616	1,858	2,137	2,457	2,826
Suspended solids	377.65	415.42	456.96	502.66	552.89
Sulphates, calculated as sulphate ions (SO_4^{2-})	5.81	6.13	6.45	6.77	7.09
Monophenols	11,731	14,077	16,893	20,272	24,326
Oil, oil products, mineral oil or liquid products obtained from the thermal treatment of solid fuel or other organic matter	2,620	3,013	3,465	3,985	4,582
Other hazardous waste for the purposes of the Water Act, which have not been specified above	12,039	13,844	15,921	18,309	21,056

Notes: 1. *Calculated as the biochemical oxygen demand for the decomposition of such matter during seven twenty-four hour periods.*

The pollution charge rates specified in subsection (1) of this section are increased by a factor of:
1) 2.5 if the pollutants are discharged into soil with unprotected groundwater;
2) 1.5 if the receiving water body is located within the boundaries of a city, town or beach, or nearer than 200 metres to a beach specified by a resolution of a local authority, or if the receiving water body is a sea or transboundary water body or a water body under protection as the habitat or spawning site of salmonids or cyprinids;
3) 1.2 if waste water is directed into the sea through a deep-sea outlet.
N.B. If it is possible to simultaneously apply multiple factors of increasing the pollution charge rate specified in subsection (2) of this section, the highest factor will be applied.
In addition to the pollution charge rates established in the table above, the pollution charge is paid, provided that the pH of the discharged waste water is higher than 9.0 or lower than 6.0, at the rate of up to 0.19 euros per each tenth of the pH unit by which the pH of the waste water is higher than 9.0 or lower than 6.0 per cubic metre.

If all the indicators that characterise the waste water discharged by a payer of the pollution charge are lower than or equal to the waste water limit values set by a water abstraction permit and the person abstracting water has submitted to the authority that granted the water abstraction permit a report specified in subsection 21 (6) of the Water Act by the due date and to the extent of the required data, the pollution charge rates established in the table above will be reduced regarding the discharge by a factor of 2. Reduction is not applied in the event of a temporary water abstraction permit.

- Air pollution fee:

- The pollution charge rates per tonne of pollutant emitted into the ambient air are presented in Table 180.[825]

Table 180: Air Pollution Charge Rates per tonne of Pollutant Emitted (Estonia, 2012-2015)

Pollutant	Charge (€ per tonne)				
	2011	2012	2013	2014	2015
Sulphur dioxide and other inorganic sulphur compounds	51	66.21	86.08	111.90	145.46
Carbon monoxide	5.25	5.78	6.35	6.99	7.70
Particulates (except heavy metals and compounds of heavy metal)	51.19	66.53	86.47	112.42	146.16
Nitrogen oxides	83.53	91.90	101.10	111.20	122.32
Volatile organic compounds (except mercaptans and methane)	83.53	91.90	101.10	111.20	122.32
Mercaptans	27,320	28,686	28,830	30,271	31,785
Heavy metals and compounds of heavy metals	1,228	1,240	1,252	1,265	1,278

Notes:

The pollution charge rates in the table above are increased by a factor of:

1) 1.2 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of local authorities bordering the Narva River, if the height of release of the pollutants is more than 100 metres above the ground;
2) 1.5 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Jõhvi, Kiviõli, Kohtla-Järve, Narva, Sillamäe or Tartu;
3) 2 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Tallinn;
4) 2.5 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Haapsalu, Kuressaare, Narva-Jõesuu or Pärnu.

The pollution charge rate of carbon dioxide is 2 euros per tonne.

Thermal energy generators pays the pollution charge for the release of carbon dioxide into the ambient air based on the quantity of CO2 released into the environment upon generation of thermal energy.

- Waste disposal fee:

[825] Bank of Estonia Website, Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

- Tax rates per tonne of waste are shown in Table 181. [826]

Table 181: Waste Disposal Charges (Estonia, 2012-2015)

Waste Type	Charge (€ per tonne)				
	2011	2012	2013	2014	2015
Non-hazardous and hazardous waste (including construction and demolition waste that does not include asbestos)[1]	14.38	17.25	20.77	24.86	29.84
Waste building materials as well as construction and demolition waste containing asbestos	0.63	0.63	0.63	0.63	0.63
Mine waste from oil shale, including waste from mineral dressing, discharged into open dumps	n/a	n/a	0.91	0.91	0.91
Waste that contains wood preservatives, inorganic pesticides, asbestos, arsenic or lead[2, 3]	62.65	62.65	62.65	62.65	62.65
Waste that contains mercury, cadmium, cyanides, polychlorinated biphenyls or polychlorinated terphenyls or organic pesticides[3]	625.56	625.56	625.56	625.56	625.56
Oil shale fly ash and oil shale bottom ash and cement clinker dust	1.44	1.72	2.07	2.48	2.98
Oil shale semi-coke	1.44	1.72	2.07	2.48	2.98
Oil, oil products, mineral oil and the liquid products of thermal processing[4]	Pollution charge rates established for non-hazardous waste				

Notes:

1. Deposit of which is permitted in a landfill for non-hazardous waste based on the waste permit or integrated environmental permit for the operation of landfills held by the possessor of the landfill, except for the other waste given in the table.

2. With the exception of coal and oil shale tar and products thereof, as well as bituminous compounds containing such materials and waste pitch from the treatment of oil shale.

3. Pollution charge rates are imposed based on the content of the hazardous substance set forth therein only if the classification of the waste as a hazardous substance based on subsection 6 (2) of the Waste Act arises from the presence and content of the very substance specified above in the waste.

4. Thermal processing refers to the thermal processing of solid fuel or another organic substance, organic solvents, heavy metals (except those otherwise specified in the table), organic halogen compounds, dyestuffs and pigment-containing waste, paint and varnish waste, contagious hospital or health care waste and treatment waste.

[826] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

- A packaging excise duty is in place:
  - Rates (2012):
    - Glass: €0.60 per kg.
    - Metal: €2.50 per kg.
    - Paper and cardboard: €1.20 per kg.
    - Plastic: €2.50 per kg.
    - Wood: €1.20 per kg.[827]
  - It should be noted that this duty is payable only by those organisations who failed to meet their obligations to collect and recycle /recover waste. As such, the revenues raised are rather small.
  - Revenue (2012): €0.3 million (equivalent to 0.002% of GDP).[828]
- A mineral resources extraction charge is paid for the extraction of mineral resources in Estonia:[829]
  - The charges (2009) applied to different mineral resources is summarised in Table 182.[830]
  - For sand and gravel below the water table the final charge should be multiplied by a coefficient of 0.5.[831]

Table 182: Mineral Resources Extraction Charge Rates (Estonia, 2009)

Mineral Resource	Unit	Charge Rate	
		EEK	EUR[1]
Dolomite for fill-up soil	m^3	7	0.447
Dolomite with low quality	m^3	8	0.511
Dolomite with high quality	m^3	14	0.895
Technological dolomite	m^3	39	2.493

[827] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[828] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

[829] Estonian Environmental Charges Act, entered into force on 1st January 2006, www.legaltext.ee/text/en/x110001.htm

[830] Estonia Statistics (2010) *Economy Wide Material Flow Account*, www.stat.ee/material-flow-accounts, p. 104.

[831] Estonian Environmental Charges Act, Article 9(5), www.legaltext.ee/text/en/x110001.htm

Mineral Resource	Unit	Charge Rate	
		EEK	EUR[1]
Decorative dolomite	m^3	29	1.853
Crystalline building stone	m^3	10.5	0.671
Gravel for fill-up soil	m^3	4.6	0.294
Constructional gravel	m^3	22	1.406
Sand for fill-up soil	m^3	3.9	0.249
Construction sand	m^3	14	0.895
Sand for technology	m^3	17.5	1.118
Limestone for fill-up soil	m^3	6.5	0.415
Limestone with low quality	m^3	8	0.511
Limestone with high quality	m^3	14	0.895
Technological limestone	m^3	22	1.406
Limestone for clay	m^3	29	1.853
Ceramic and ceramsite clay	m^3	6.5	0.415
Infusible clay	m^3	14	0.895
Cement clay	m^3	7	0.447
Peat for fuels and fertilizers	tonne	16.2	1.035
Peat dust	tonne	10.4	0.665
Phosphate rock	tonne	11.6	0.741
Oil shale	tonne	12	0.767
Note: 1. Conversions based on an exchange rate of EEK15.6466 = €1.0. The Estonian kroon was fixed to the Euro as of 1st January 2011 (Official Journal L 196, 28/7/2010, Council Regulation (EU) No 671/2010 of 13 July 2010 amending Regulation (EC) No 2866/98)			

- Fishing fee (not reported to Eurostat):
  - Paid for the right to fish and collect aquatic plants. Rates are specific to each species of fish.
  - The limit rates (2013) for the fishing charge are the following:

- Upon commercial fishing: up to 4 percent of the quantity of fish caught on the average or the normal value of individuals caught during the year preceding the year of establishment of the charge with fishing gear or per fishing day on a fishing ground, but not less than €0.95, except for the events specified in subsections (5) and (6) of this section or if the fishing charge has been established by an international agreement or if the fishing charge concerns a lamprey trap which must not be less than €0.60. The fishing charge per one individual may be less than €0.95.
- Between €63.90 and €320 per fishing day, between €1.25 and €63.90 per tonne of caught fish, between €0.95 and €128 per fishing gear per year, except for a lamprey trap for which the fishing charge may be between €0.60 and €1.55 and between €0.30 and €0.95 per individual. The fishing charge per fishing gear used for fishing eel may be up to €639 per year. The fishing charge per Danish seine used on Lake Peipsi may be between €1,278 and €2,556 per year.
- Between €0.06 and €6.35 per individual or kilogramme of fish upon special purpose fishing.
- Between €0.03 and €12.75 per twenty-four hour period upon recreational fishing. The recreational fishing charge for the right to fish with a dipnet or trap is between €0.95 and €12.75 per fishing gear per twenty-four hour period.[832]

- Fishing charges for Professional fishermen with fishing boats in 2014 are:
  - Herring – €3.52 per tonne.
  - Sprat – €3.52 per tonne.
  - Cod – €33.55 per tonne.
  - Salmon – €0.30 per specimen.
  - Flounder – €10.6 per tonne.[833]
- Revenue (2012): €1.5 million (equivalent to 0.009% of GDP).[834]

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[832] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

[833] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

[834] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

- Hunting charge (not reported to Eurostat):
  - Valid Hunting Charge (2013) is €10.00 per person for 365 days.[835]
  - €0.01 - €0.18 per hectare of hunting district and game. [836]
  - In 2012 State revenue from the sales of hunting rights was €0.42 million (equivalent to 0.002% of GDP). [837]
- Forest cutting right charge (not reported to Eurostat):
  - The cutting right of timber is determined by either public auction, tender or at a negotiated price.
  - In 2011, the average price was €9.80 per m^3, with cutting rights sold for 36,114 m^3. [838]
  - In 2012, the average price was €10.80 per m^3, with cutting rights sold for 38,506 m^3. [839]

A.9.4 Water Charges

- Water abstraction fee:
  - 'Counted' under resources taxes.
  - Exemptions for the generation of hydro energy, irrigation of agricultural land, fish farming.
  - Rates (2013): minimum and maximum fees set by government for various categories of sources and uses of water (per 1,000 m^3). Actual rates in Table 183:
    - Surface water: €14.65 – €38.34.
    - Surface water as cooling water: €1.55 – €7.66.
    - Water from specific aquifers: €30.65 – €191.70.
    - Mineral water for drinking: €1,469 – €2,300.81.
    - Mineral water for therapeutic baths: €146.90 – €230.08.

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[835] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

[836] Bank of Estonia Website , Adoption of the Euro Act, Accessed 6th January 2014, http://www.eestipank.ee/en/adoption-of-the-euro-act

[837] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[838] Data obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia.

[839] Data obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia.

- Water pumped out of quarries: €9.58 – €63.91.
- Water pumped out of mines: €25.56 – €77.84.[840]

- Revenue (2012): €13.4 million (equivalent to 0.08% of GDP). [841]

Table 183: Water Extraction Charges (Estonia, 2011 - 2015)

Water Extraction from Surface Water Bodies and from Ground	Rates of Water Extraction Charges (€ per 1,000m³)					
	01.01.11	01.01.12	01.01.13	01.04.13	01.01.14	01.01.15
Water Bodies						
Belonging to Tallinn water supply system	30.93	34	35.72	35.72	37.51	38.30
Cooling water from Tallinn water supply system	6.19	6.77	7.15	7.15	7.47	7.65
Other water bodies	23.19	25.50	26.77	26.77	28.12	29.52
Cooling water	1.59	1.59	1.59	1.91	2.29	2.75
Groundwater Layers						
Kvaternaari layer	49.46	54.45	57.13	57.13	60.01	63.01
Devon to Ordovitium-Cambrium layer	66.53	73.17	76.82	76.82	80.65	84.68
Cambriumi-Vendi layer	74.26	81.67	85.76	85.76	90.05	94.52
Use of Cambriumi-Vendi layer drinking water quality for technological purpose except for food processing	132.23	145.46	152.74	152.74	160.35	168.40
Mineral water for drinking	1853.43	1981.26	2109.08	2109.08	2204.95	2300.00
Mineral water for medical purposes	191.73	198.12	210.90	210.90	220.49	230.00
Water from open cast pits	14.69	16.16	17.00	19.39	23.27	27.92

[840] Data obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia.

[841] Data on Estonia's transmission to Eurostat obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia

Water Extraction from Surface Water Bodies and from Ground	Rates of Water Extraction Charges (€ per 1,000m³)					
	01.01.11	01.01.12	01.01.13	01.04.13	01.01.14	01.01.15
Water from underground mines	40.96	45.05	47.35	54.06	64.87	76.69

A.9.5 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 10.2.2, we list here a complete list of subsidies identified in Estonia by the IEEP, OECD and SEITC for which financial information is not available:

Table 184: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
Feed-in tariff for electricity from cogeneration	IEEP	
Irrigation in Estonia is exempted from water abstraction taxes	IEEP	
Fixed tax on corporate car not integrating car value and the extent of private or business utilisation	IEEP	
Different costs of water supply for industry, households and agriculture (preferential treatment)	IEEP	
Research and development funding for oil shale electricity production, heat and oil production	SEITC	
Exemption from CO_2 emission charge and lower environmental charges for waste deposition and water extraction for the oil shale sector	SEITC	
Feed-in premium to effective co-generation and waste-fuels based on fossil fuels	SEITC	
Grants for the purchase of tractors, other agricultural equipment, diesel buses and trains	SEITC	
Grants to fishing vessel scrapping and modernisation	SEITC	
Grants for drainage systems maintenance	SEITC	
Excise duty exemption for fuels used as inputs to production	OECD	Fuels used for production of non-energy products are exempt from the excise duty payments. For example, the production of glues or paints
Excise tax exemption for shale-derived and solid fuels used by households	OECD	
Excise duty exemption for fuels used in mineralogical processes	OECD	
Excise duty Exemption for fuels used in stationary engines and warehouse vehicles	OECD	
Feed-in premium for peat and retort gas used in CHP plants	OECD	CHP plants that use peat or retort gas (a by-product of pyrolysis) in CHP generation are offered a feed-in premium of €32 per MWh. The

Subsidy	Source	Notes
		maximum period for which a CHP plant can obtain this support is 12 years.

Sources: See Table 3 in IEEP (2013) Steps to Greening Country Report: Estonia, Report for the European Commission, pp.11-12.

OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp. 143-152, dx.doi.org/10.1787/9789264187610-en

Information obtained through private communication with the Stockholm Environment Institute Tallinn Centre, Estonia.

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 173.

Table 185: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (RON million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for gas oil used as motor fuel for agricultural purposes	TAXUD	Gas Oil - Other Sectors - Agricultural/Forestry	77	1000t	92,771	1000l	392.92	110.95	26.2
Excise tax exemption for gas oil used for rail transport	TAXUD	Gas Oil - Transport - Railways	34	1000t	40,964	1000l	392.92	110.95	11.6
Excise tax exemption for domestic navigation	TAXUD	Gas Oil - Transport - Domestic Navigation	5	1000t	6,024	1000l	392.92	110.95	1.7
Excise tax exemption for fuels used in aviation	OECD	Kerosenes, jet fuels - Transport - Aviation	34	1000t	41,975	1000l	330.10	0	13.9

Sources: Sources: OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*, 2012, pp. 143-152, dx.doi.org/10.1787/9789264187610-en*

DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

Eurostat (2013) Energy Balance Sheets 2010-11, *2013, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EN-13-001/EN/KS-EN-13-001-EN.PDF*

A.9.6 Change in Tax Bases

Table 186: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	677	667	-10
Petrol	million litres	310	310	0
Kerosene	million litres	37	37	0
LPG	thousand tonnes	0	0	0
Heavy Fuel Oil	thousand tonnes	13	13	0
Natural Gas	TJ (GCV)	8,444	8,281	-163
Coal	thousand tonnes	294	268	-27
Electricity	GWh	5,911	5,911	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[842] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[842] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 128: Change in Internal Passenger Flights, flights per year

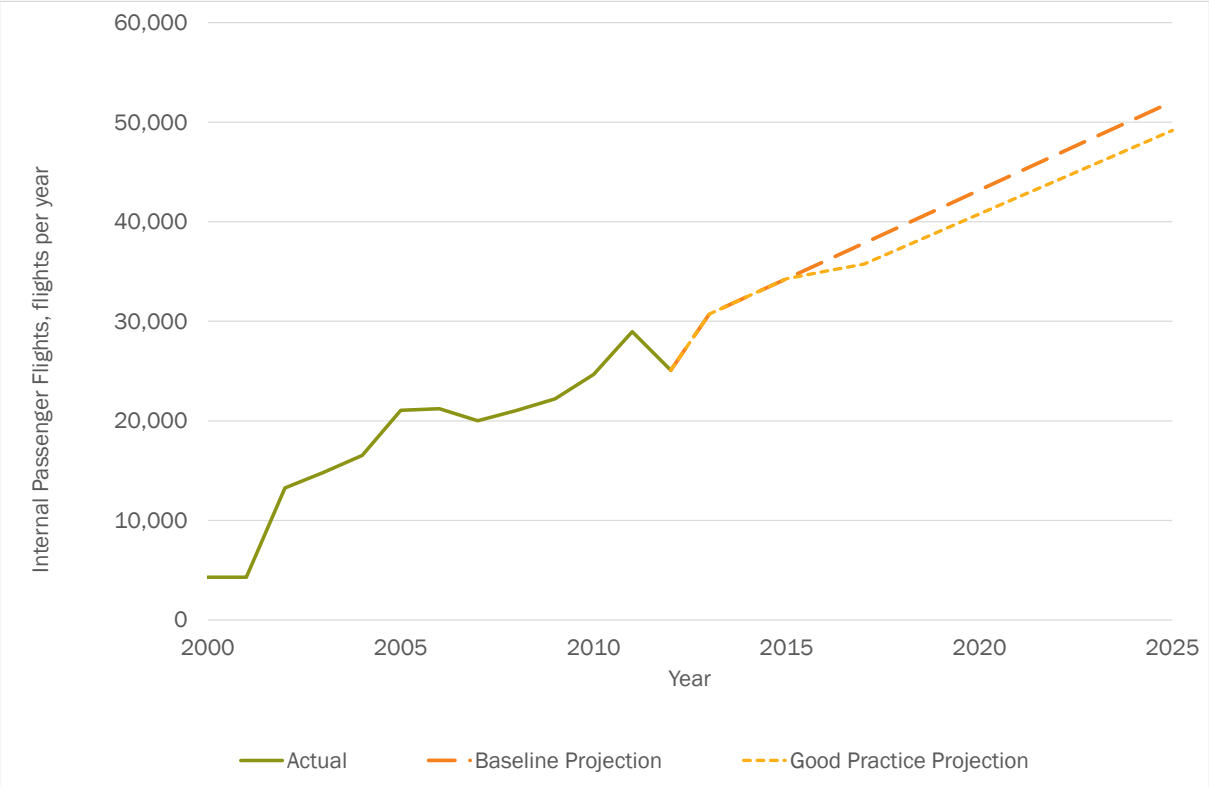


Figure 129: Change in Intra-EU Passenger Flights, flights per year

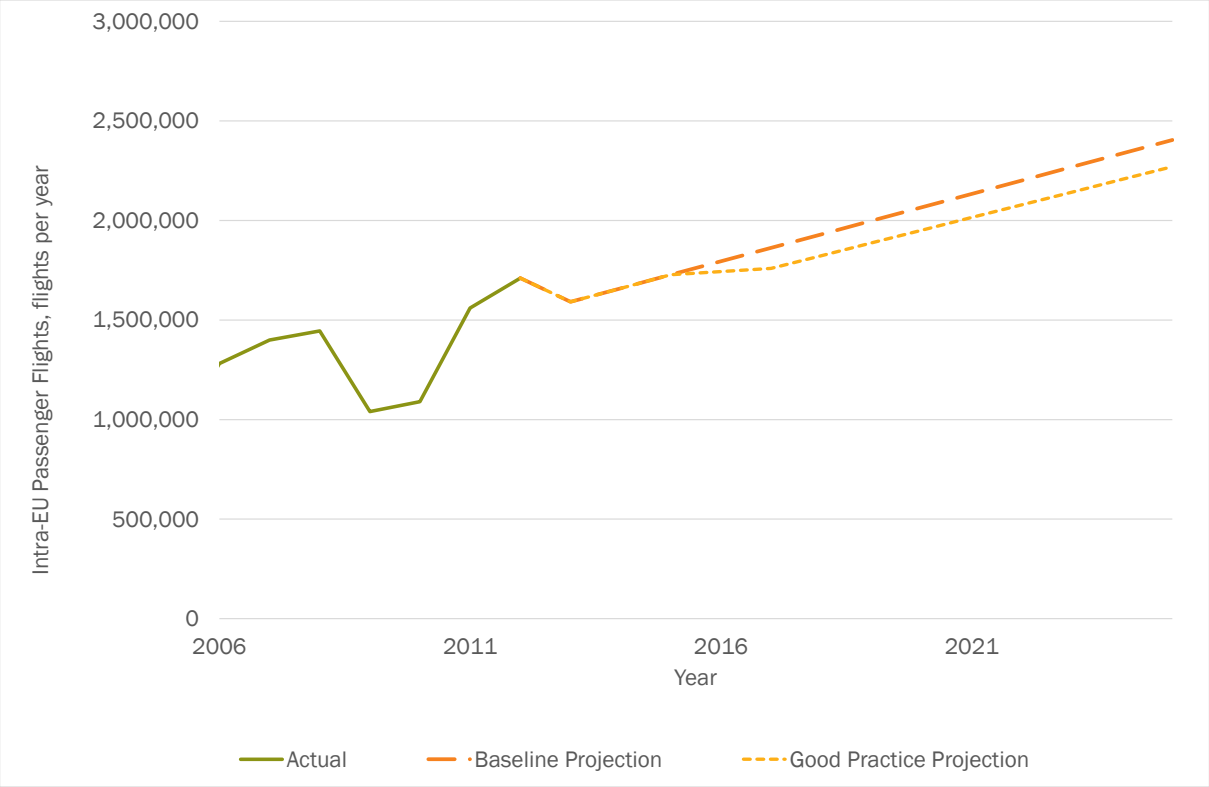


Figure 130: Change in Extra-EU Passenger Flights, flights per year

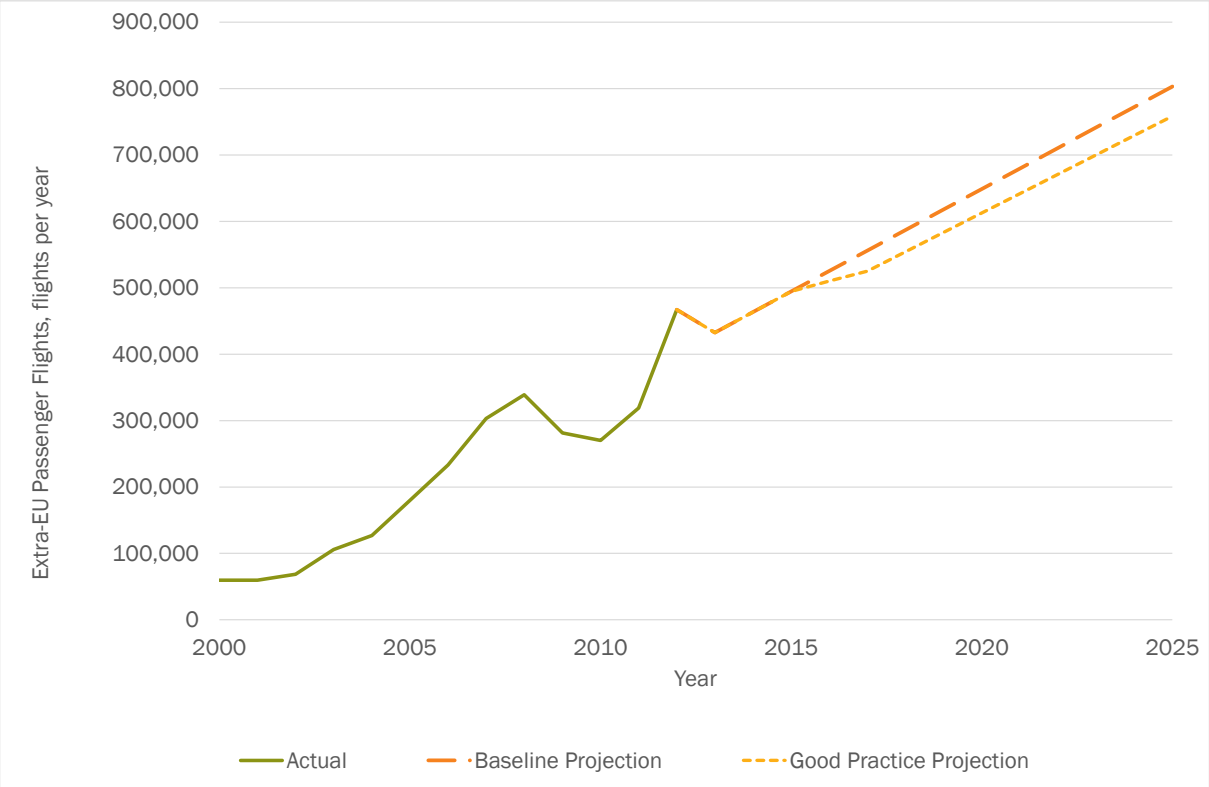


Figure 131: Change in Internal Air-freight, tonnes

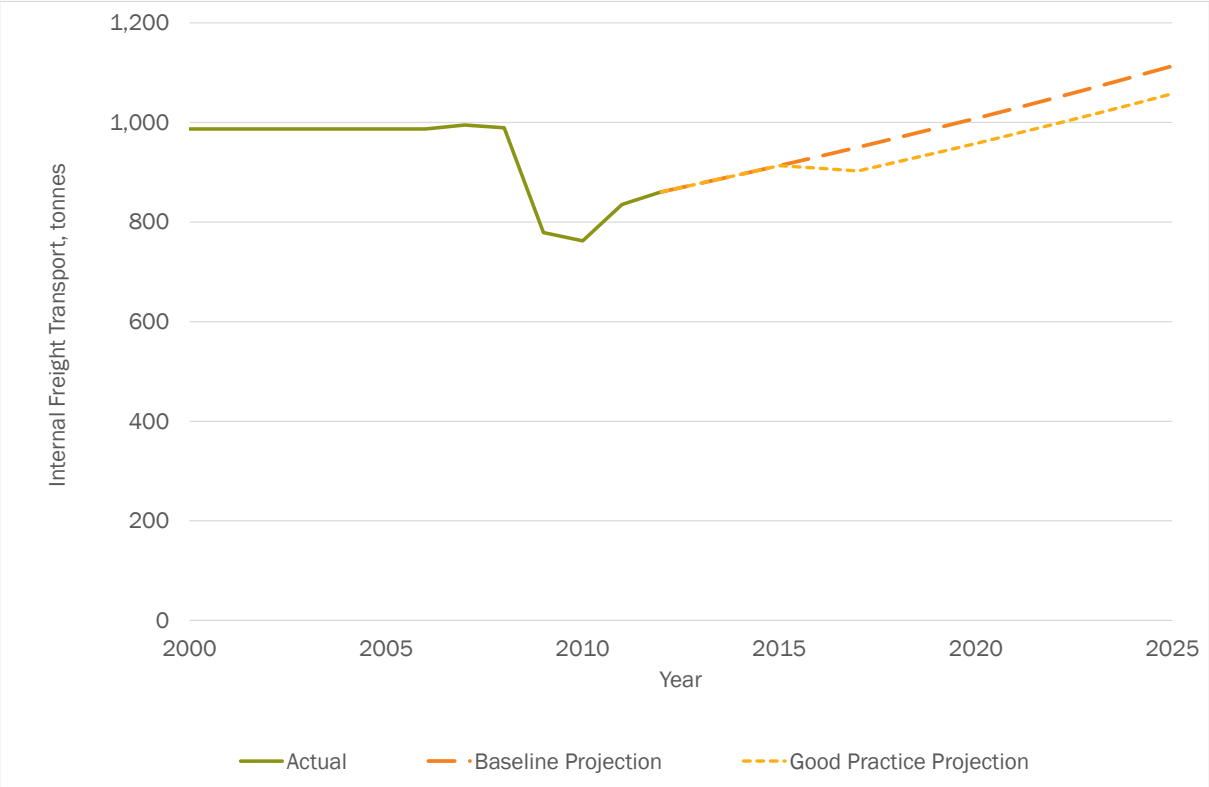


Figure 132: Change in Intra-EU Air-freight, tonnes

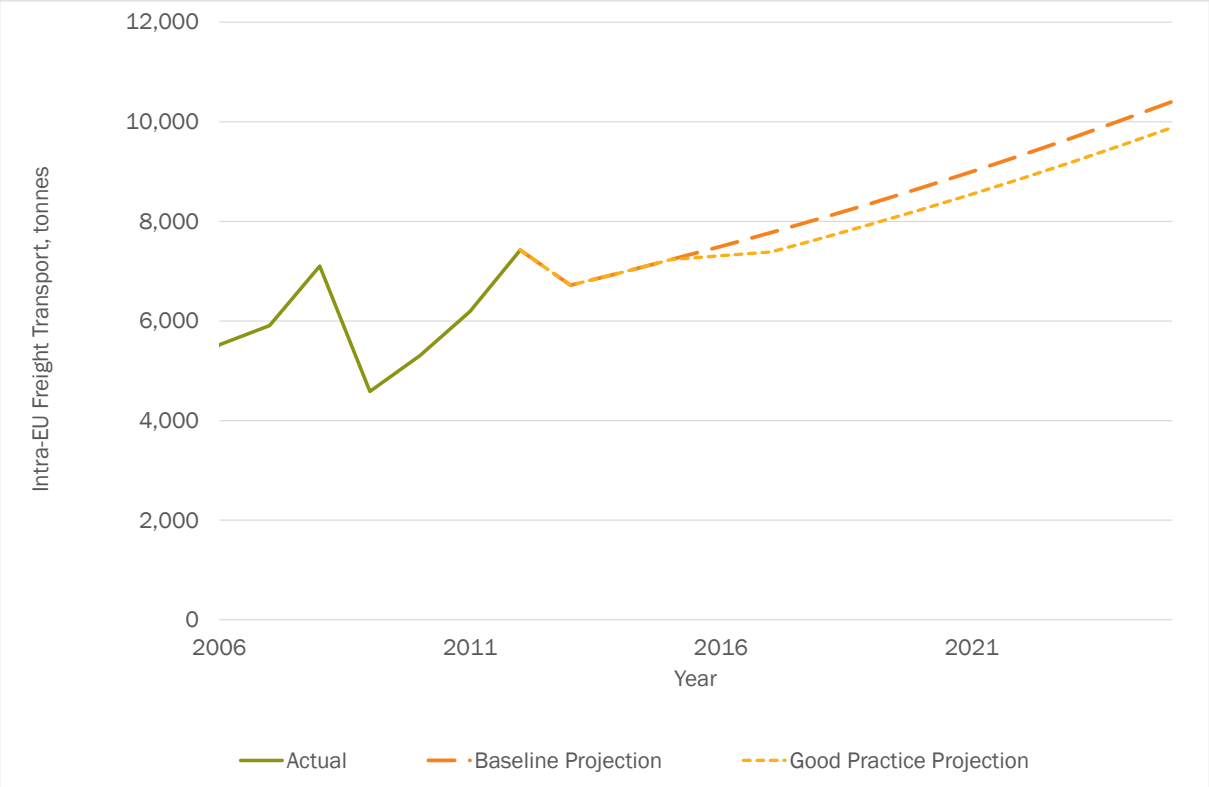


Figure 133: Change in Extra-EU Air-freight, tonnes

Figure 134: Change in Non-Hazardous Waste Landfilled, thousand tonnes

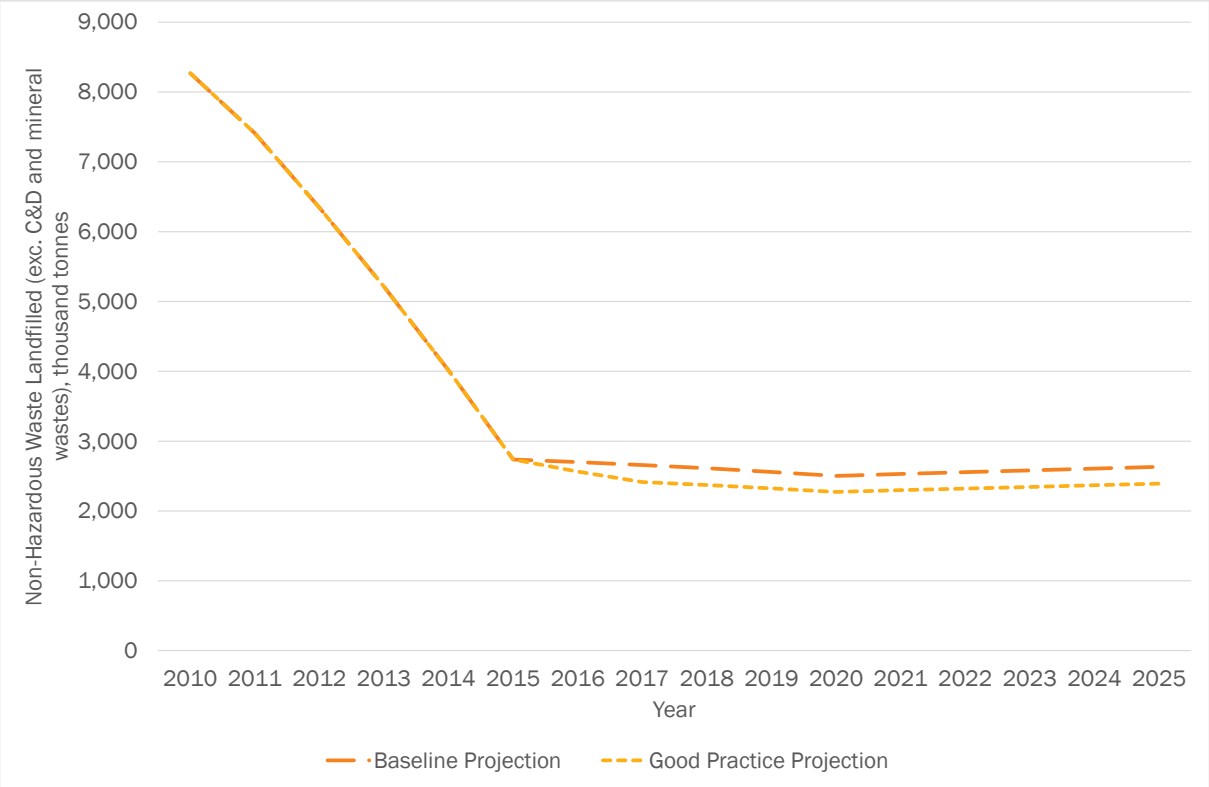


Figure 135: Change in MBT/ Incineration, thousand tonnes

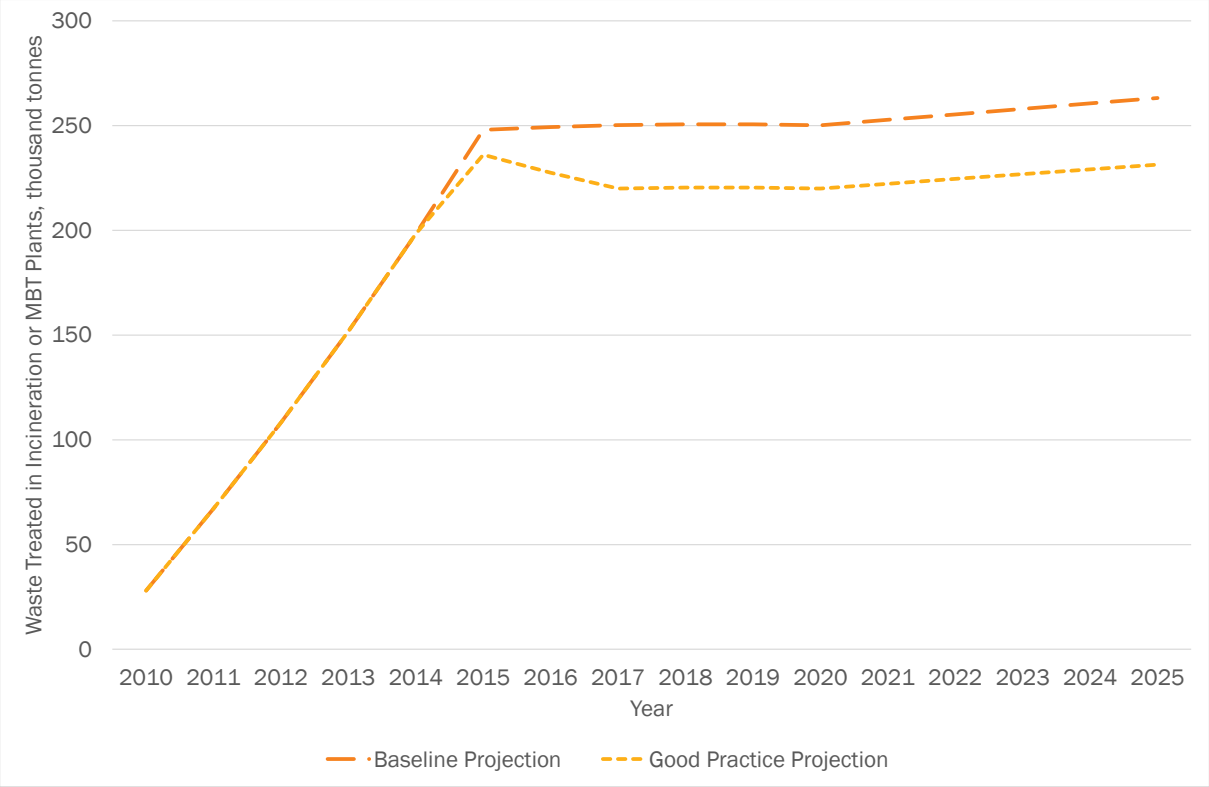


Figure 136: Change in SOx Emissions, tonnes

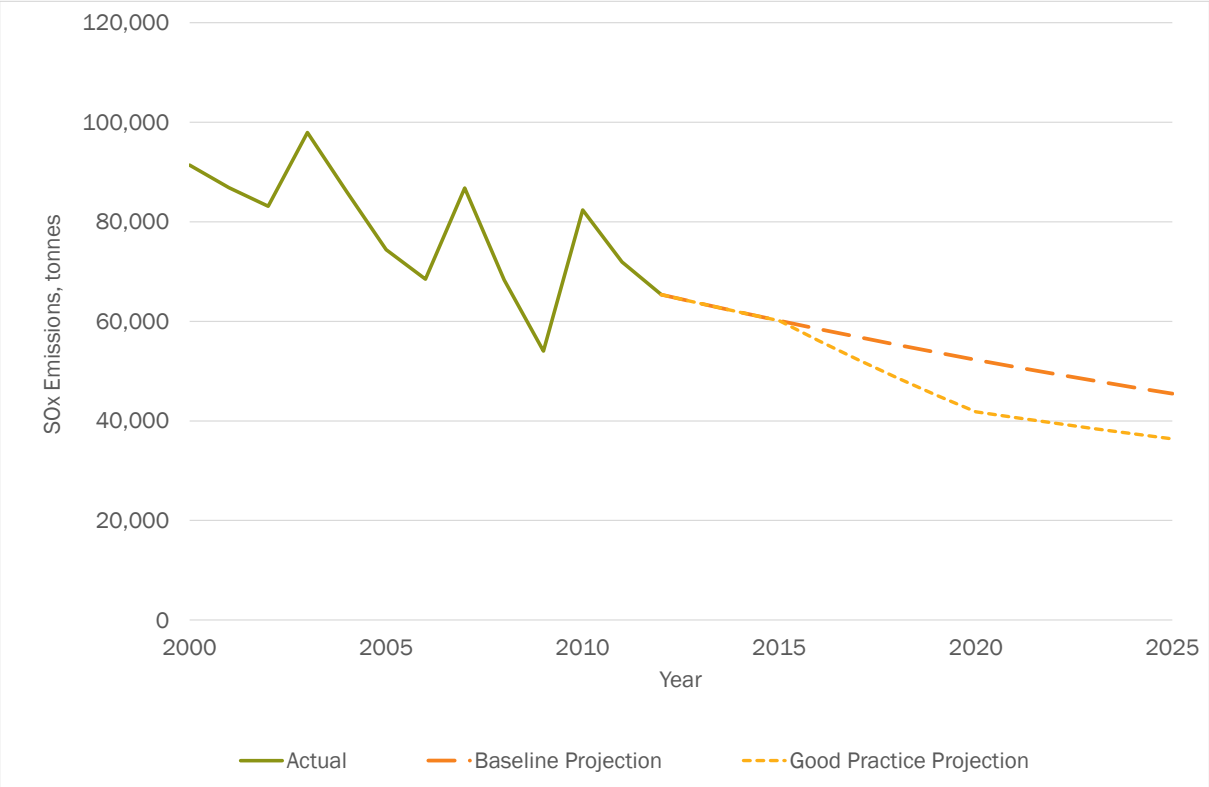


Figure 137: Change in NOx Emissions, tonnes

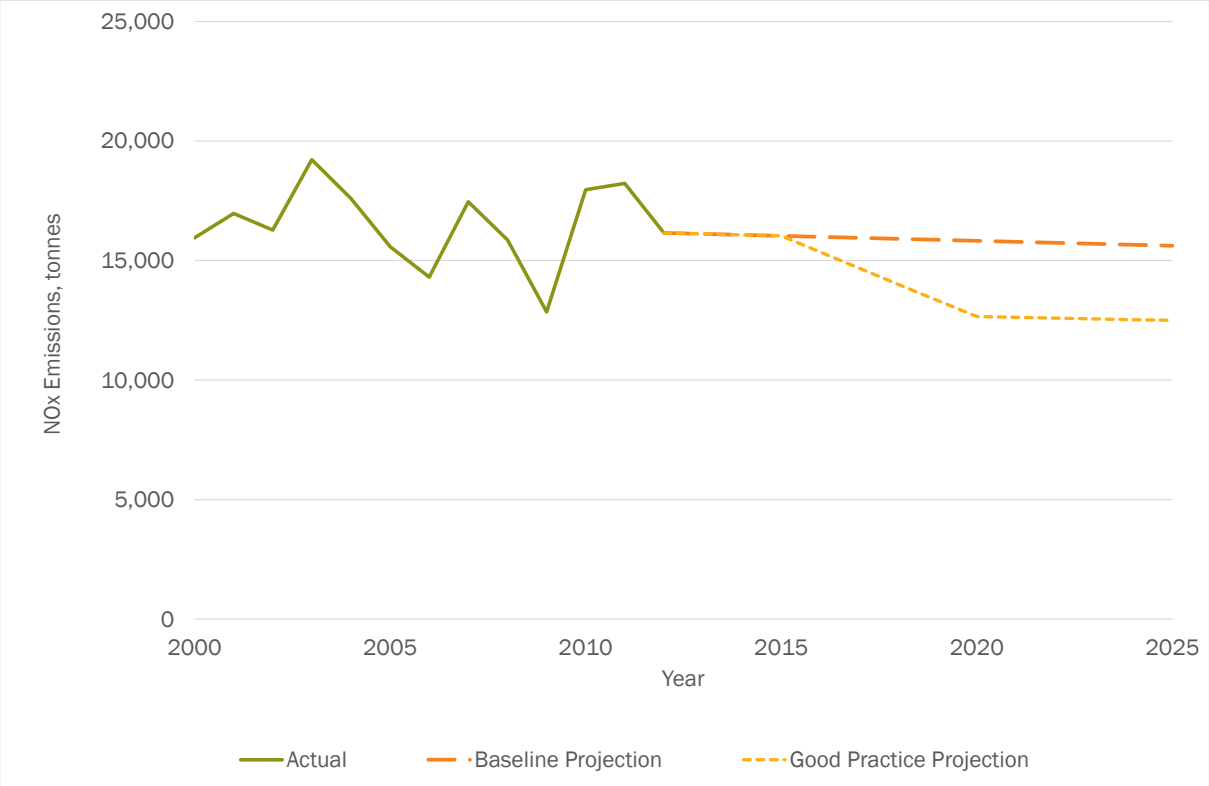


Figure 138: Change in PM_{10} Emissions, tonnes

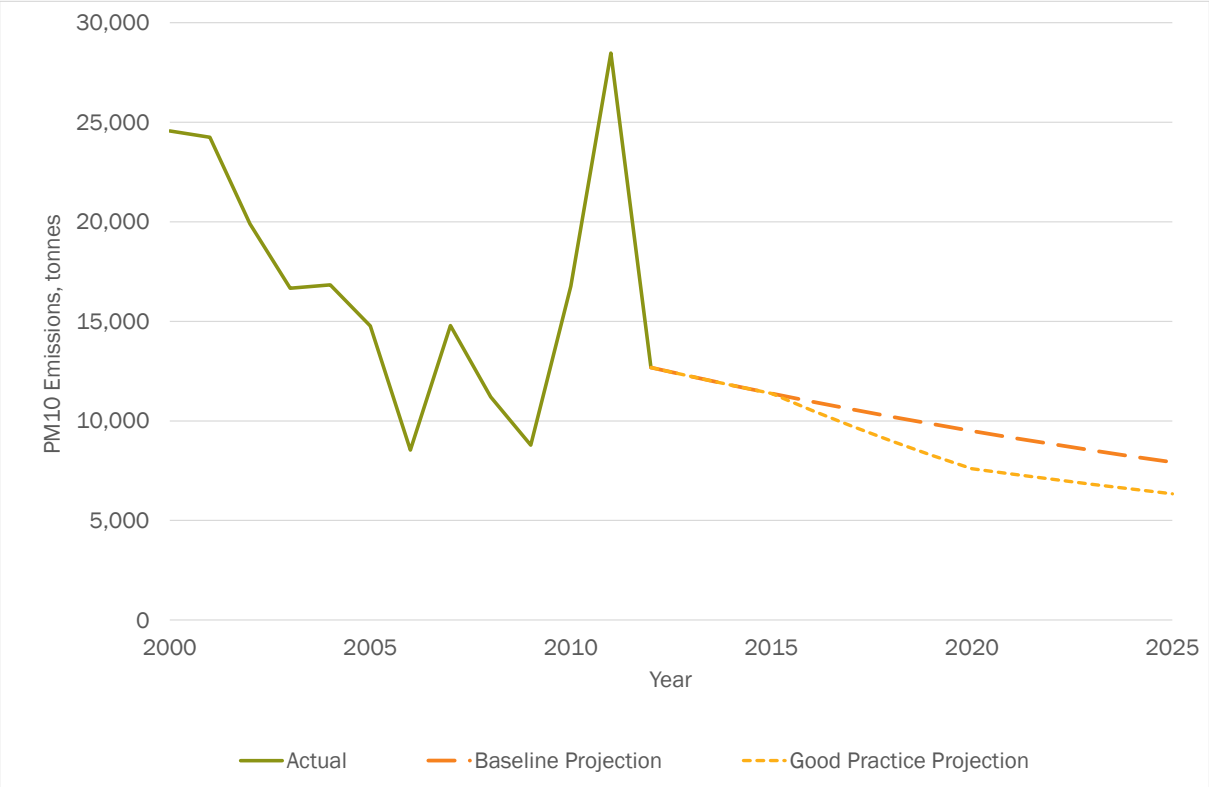


Figure 139: Change in Groundwater Abstraction – Public Supply, million cubic metres

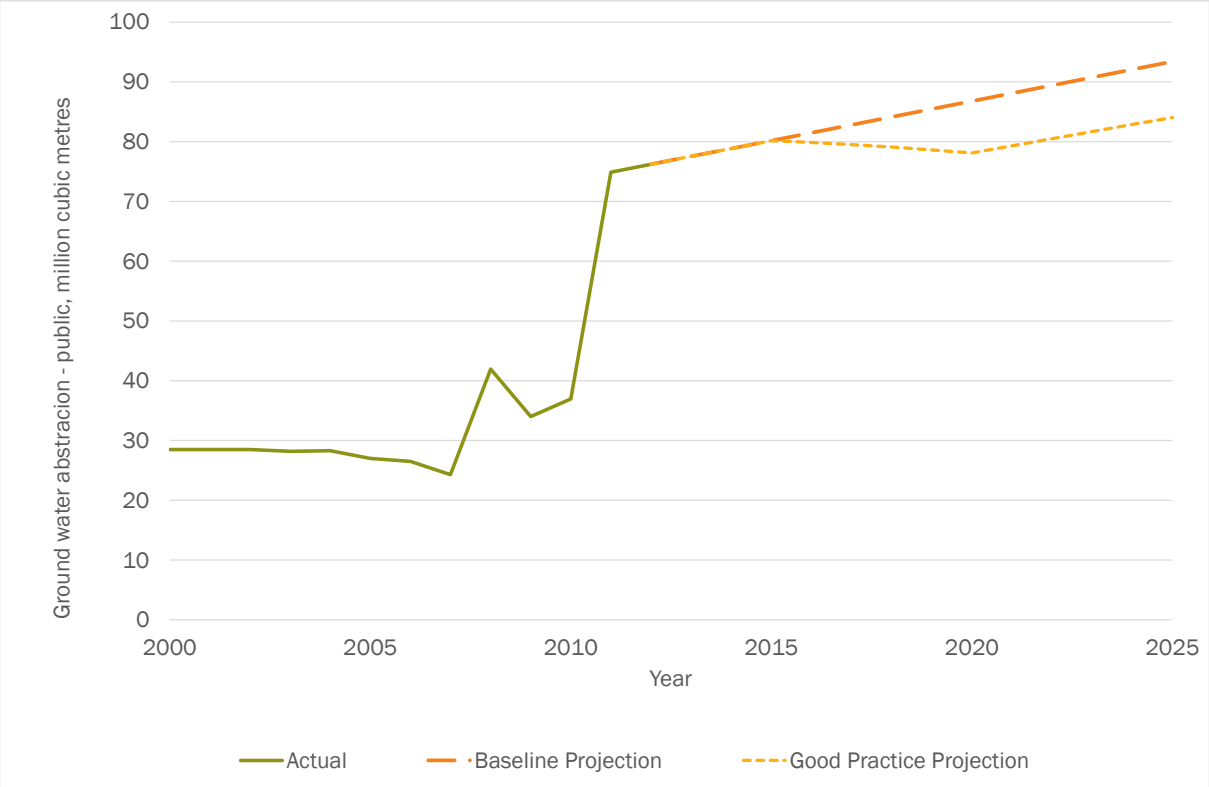


Figure 140: Change in Groundwater Abstraction – Manufacturing, million cubic metres

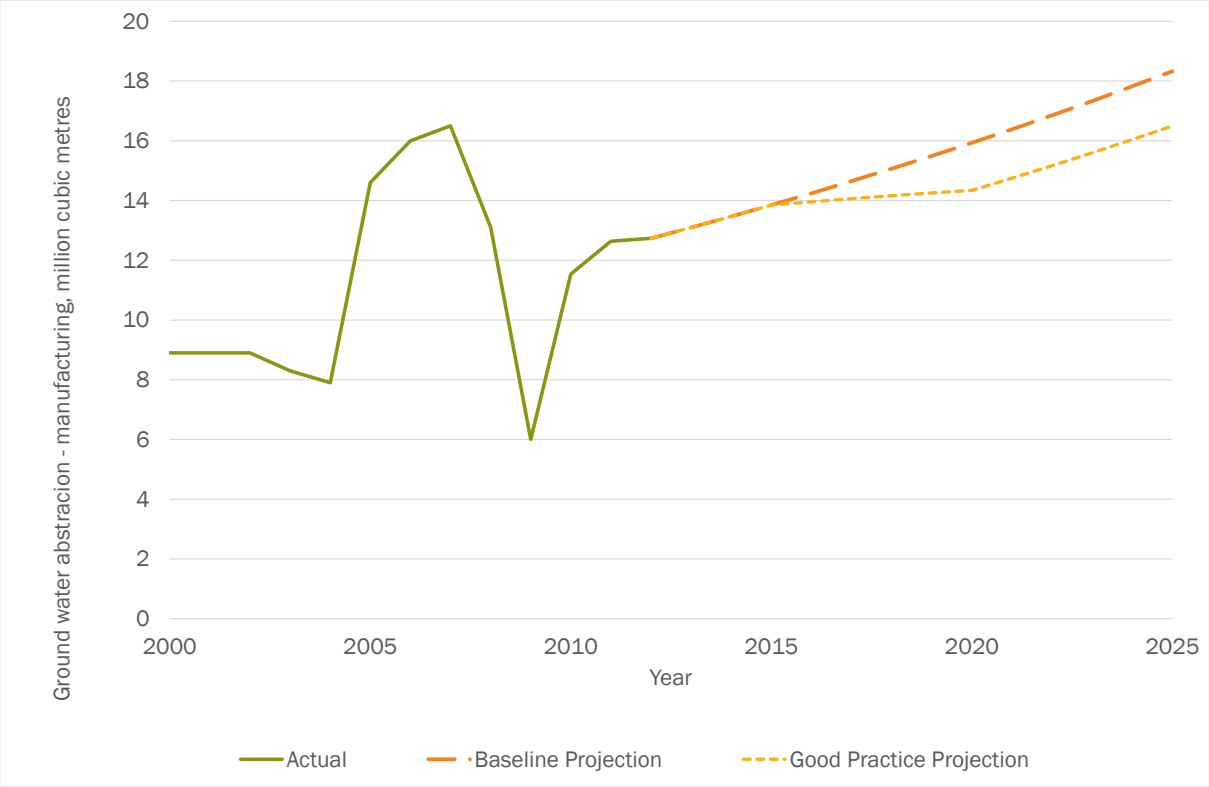


Figure 141: Change in Groundwater Abstraction – Agriculture, million cubic metres

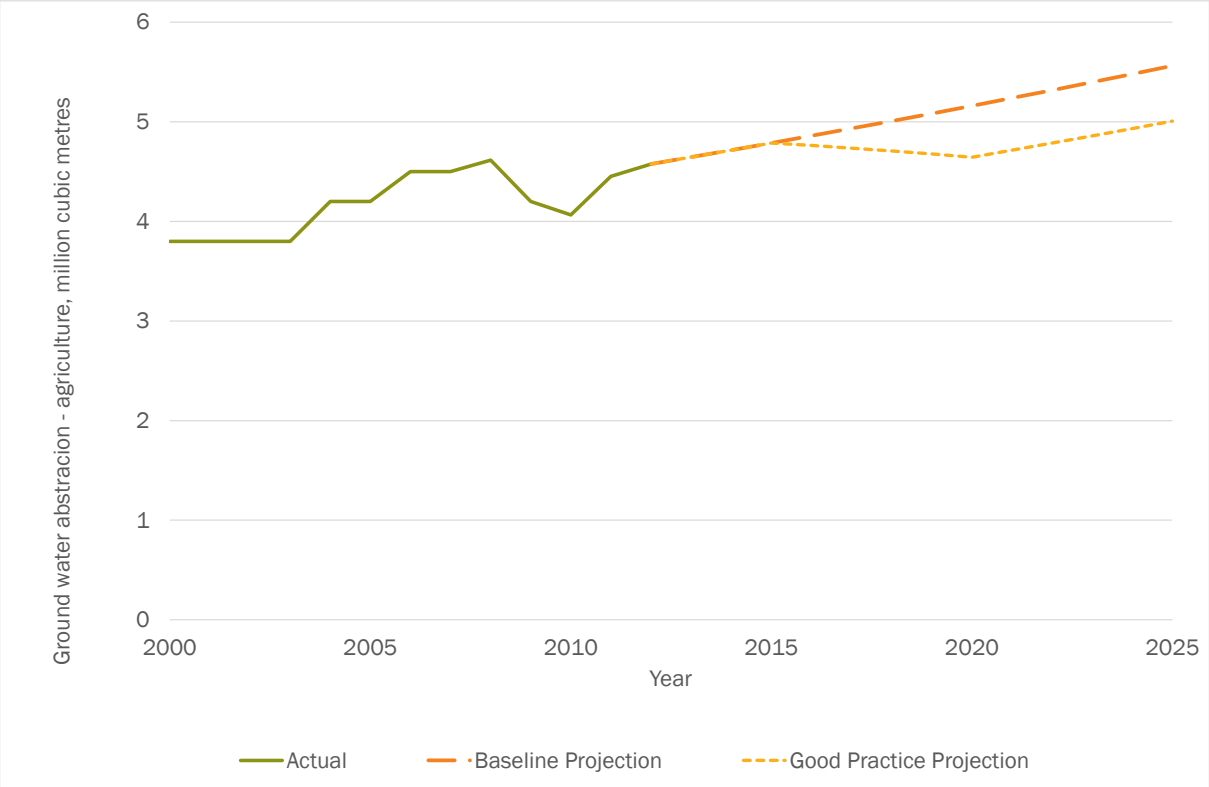


Figure 142: Change in Surface Water Abstraction – Public Supply, million cubic metres

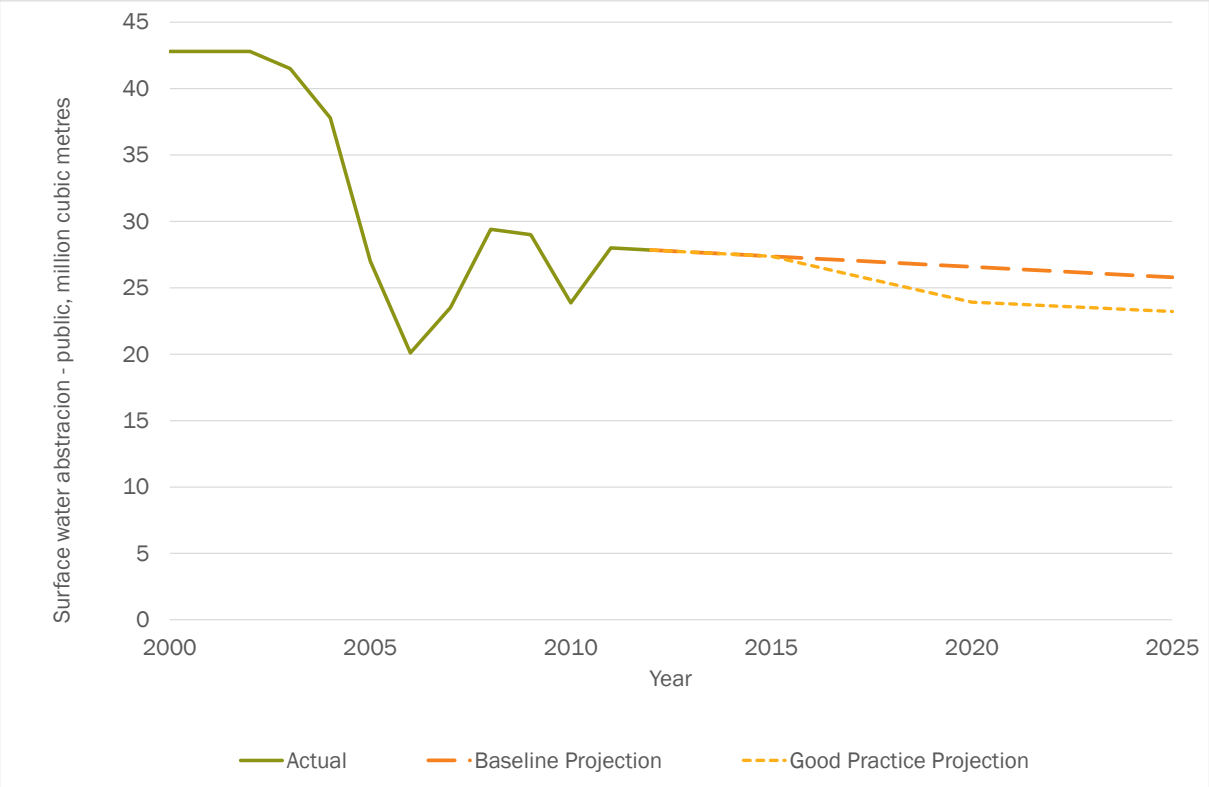


Figure 143: Change in Surface Water Abstraction – Manufacturing, million cubic metres

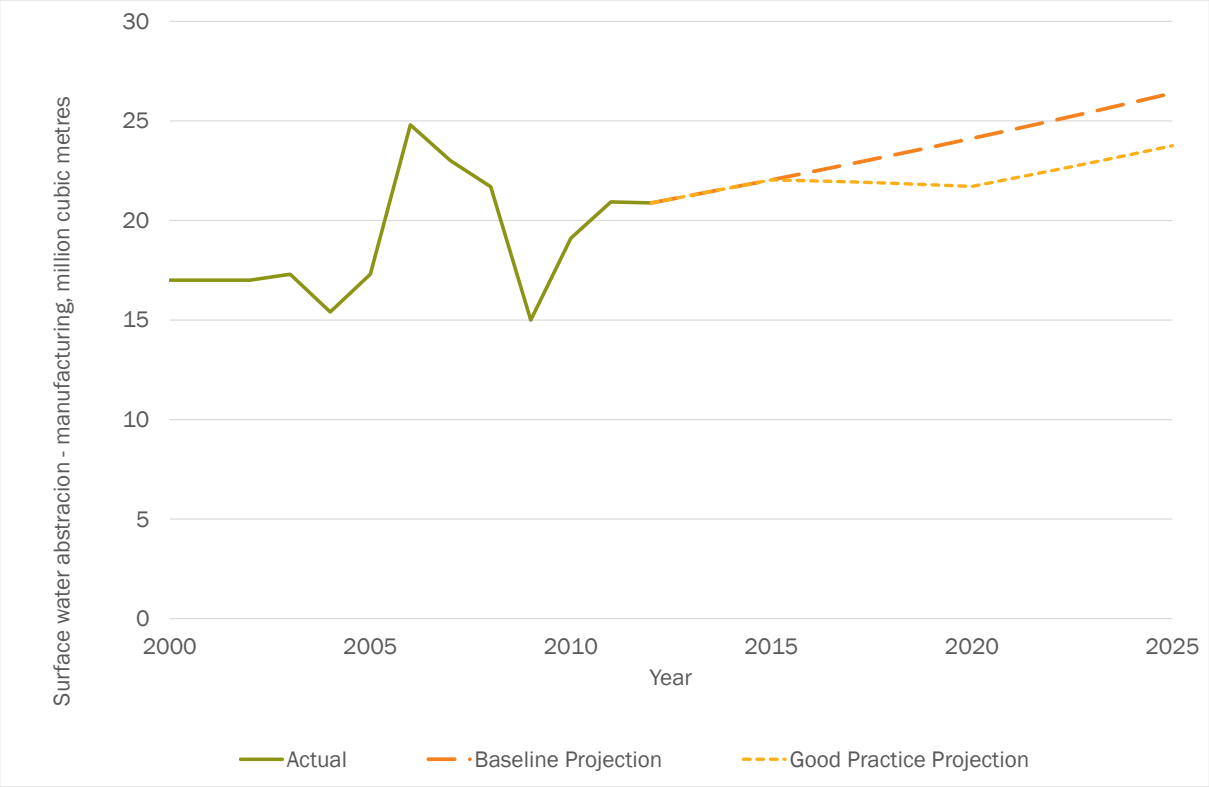


Figure 144: Change in Surface Water Abstraction – Agriculture, million cubic metres

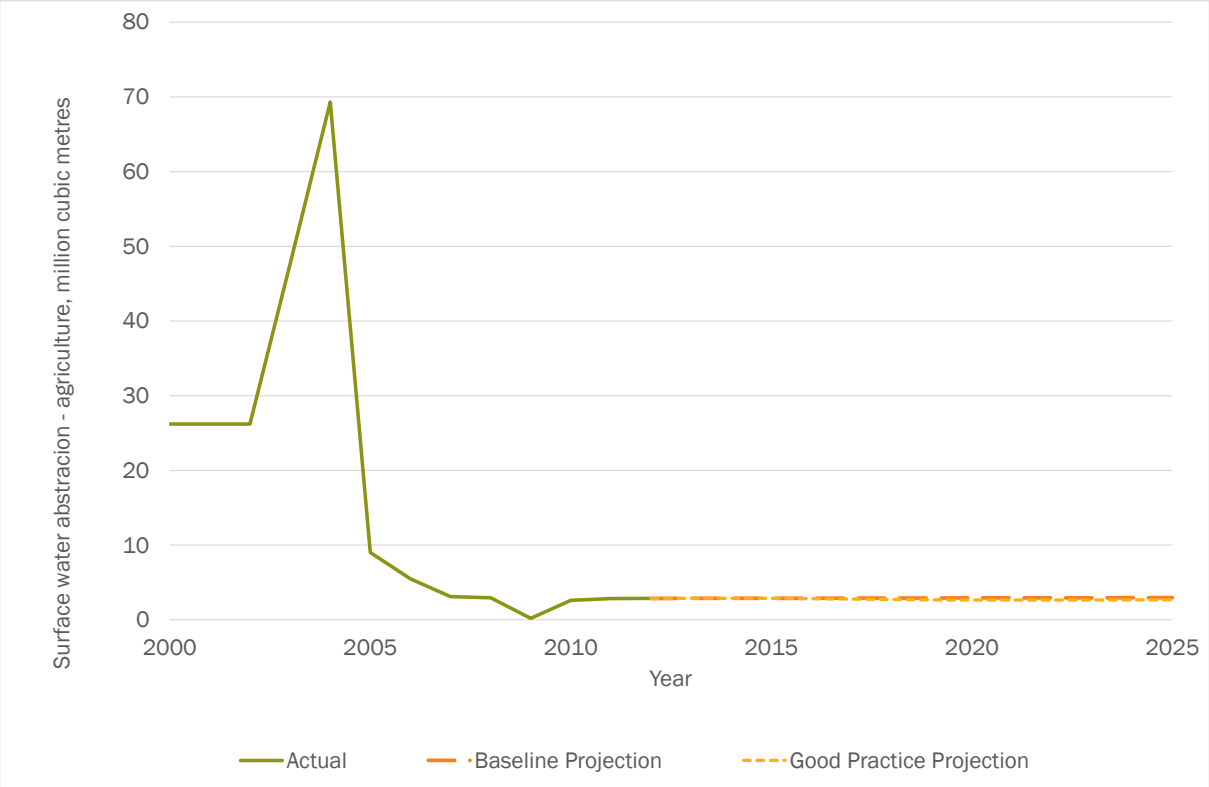


Figure 145: Change in Active Ingredients in Pesticides, tonnes

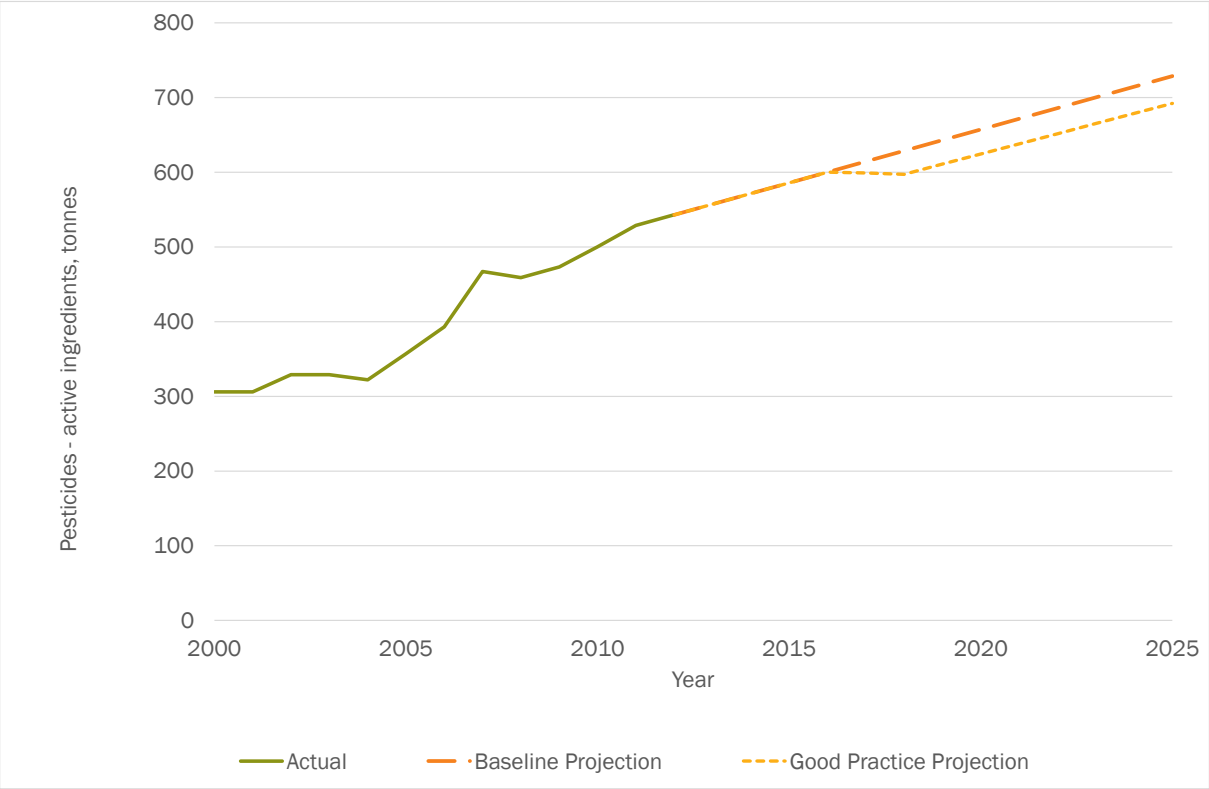


Figure 146: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

Figure 147: Change in Aggregates Extraction, thousand tonnes

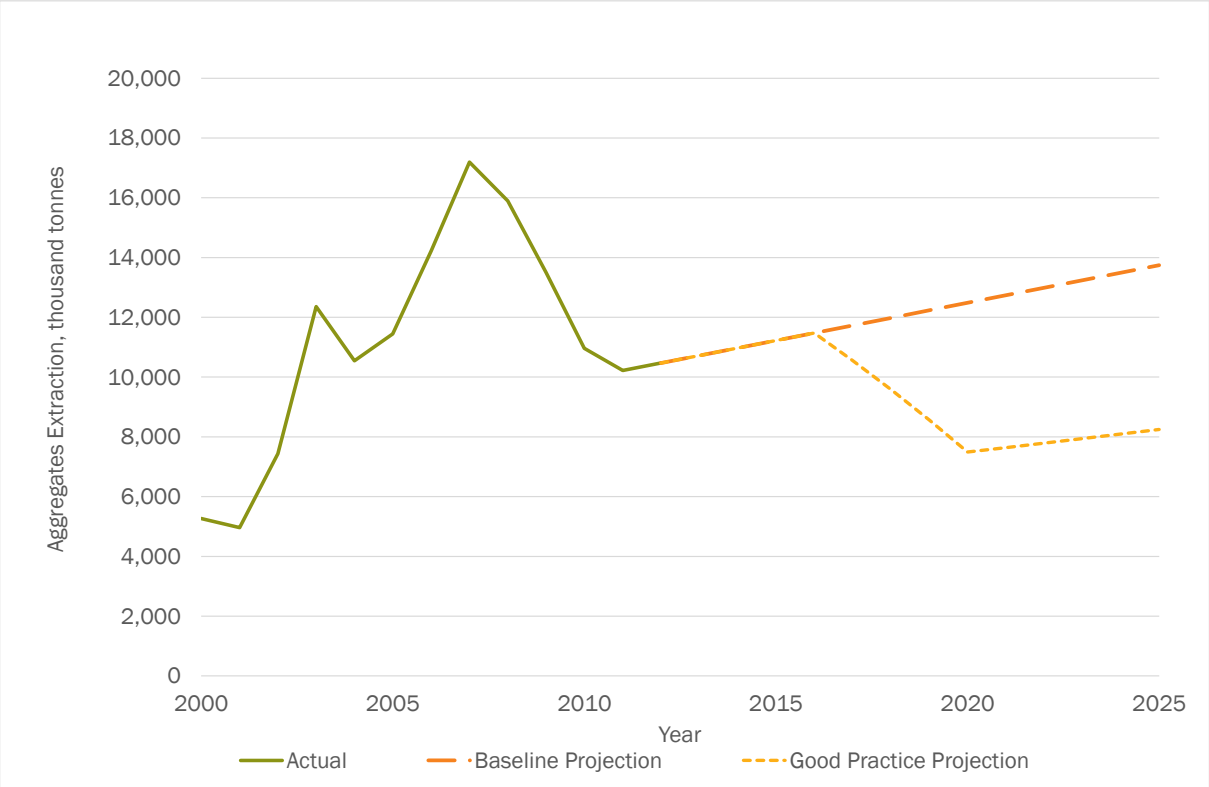


Figure 148: Change in Paper & Card Packaging Generation, thousand tonnes

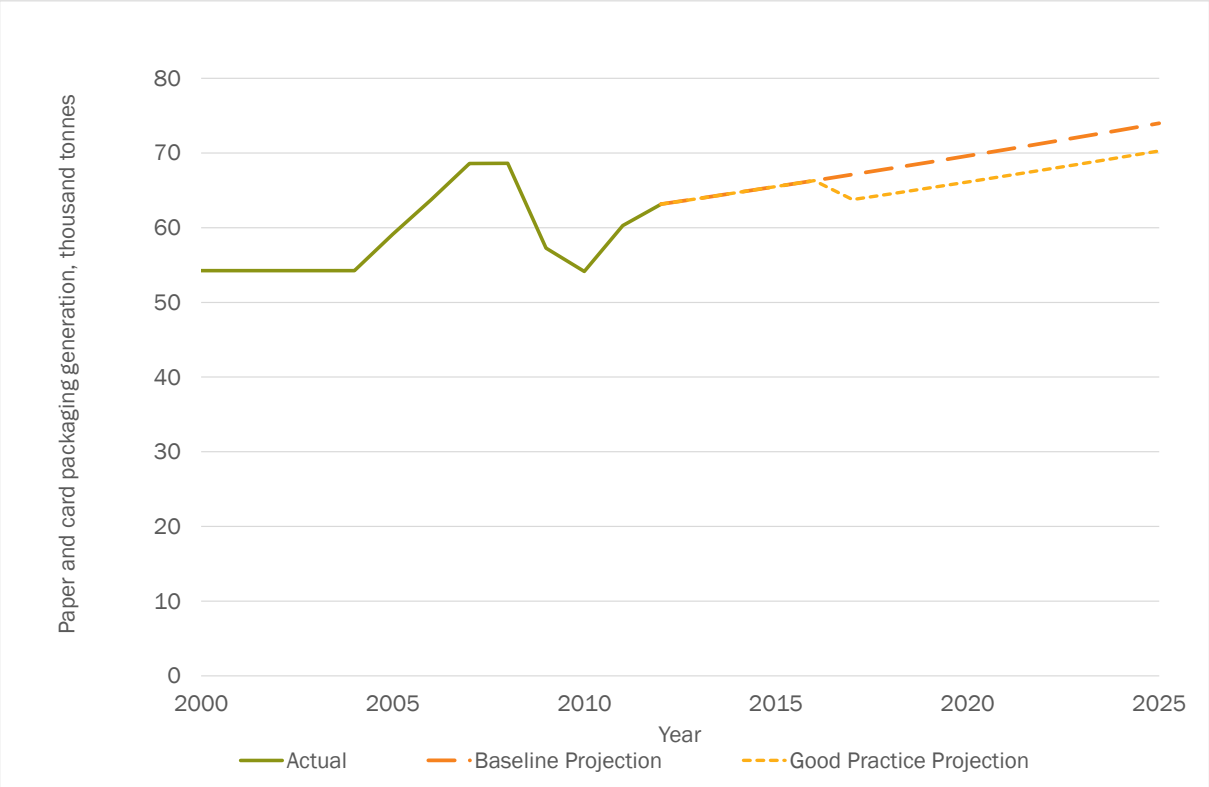


Figure 149: Change in Plastic Packaging Generation, thousand tonnes

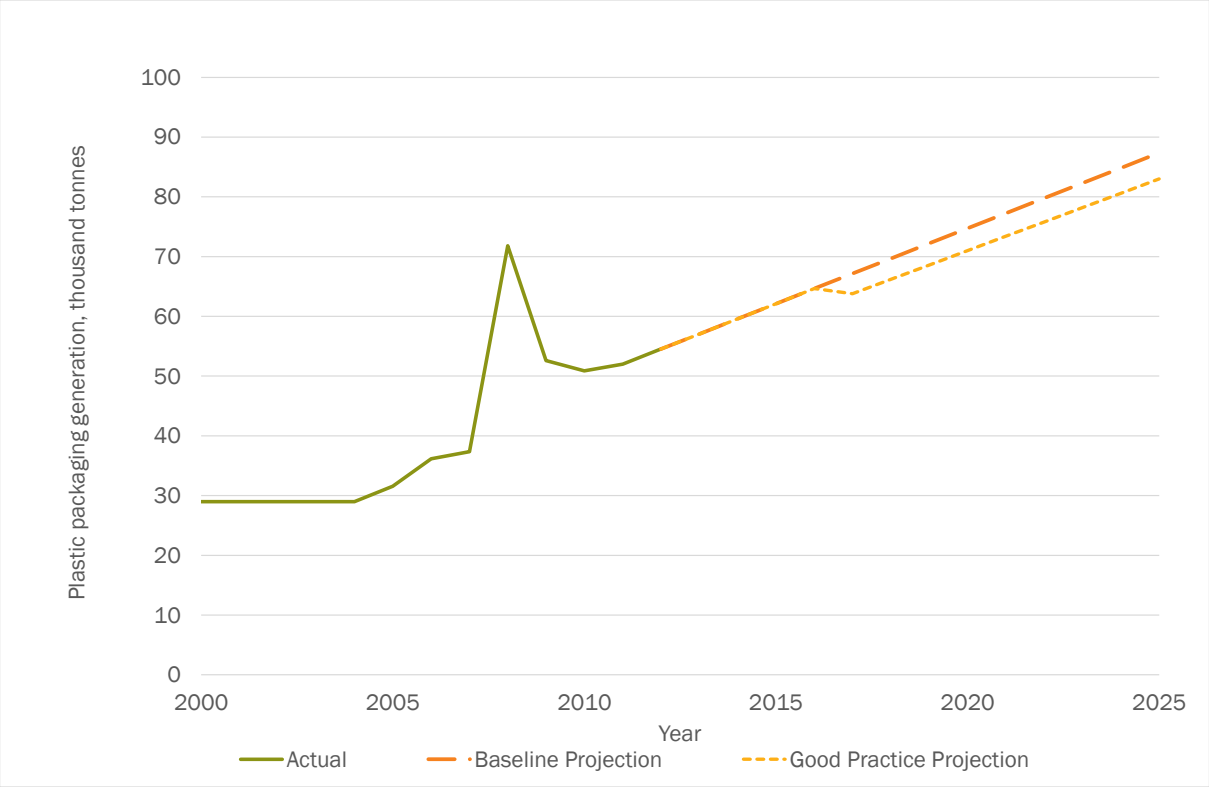


Figure 150: Change in Wood Packaging Generation, thousand tonnes

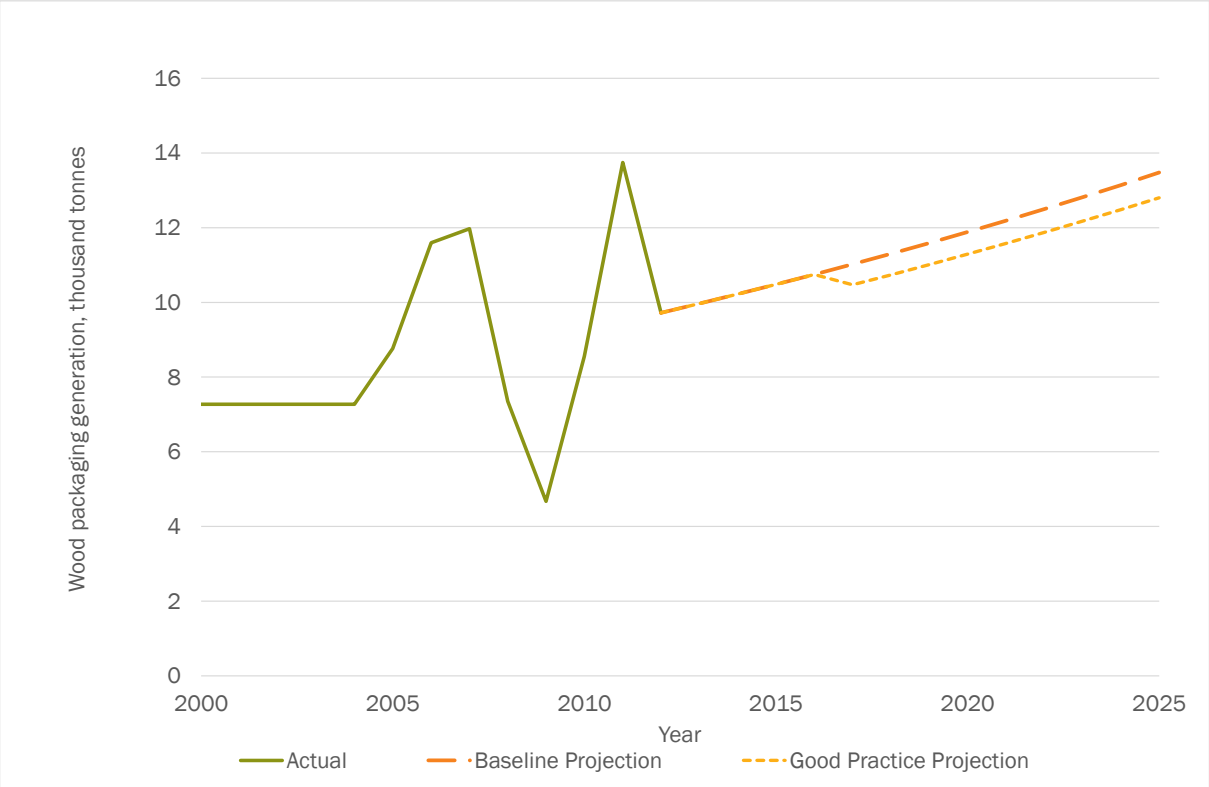


Figure 151: Change in Metal Packaging Generation, thousand tonnes

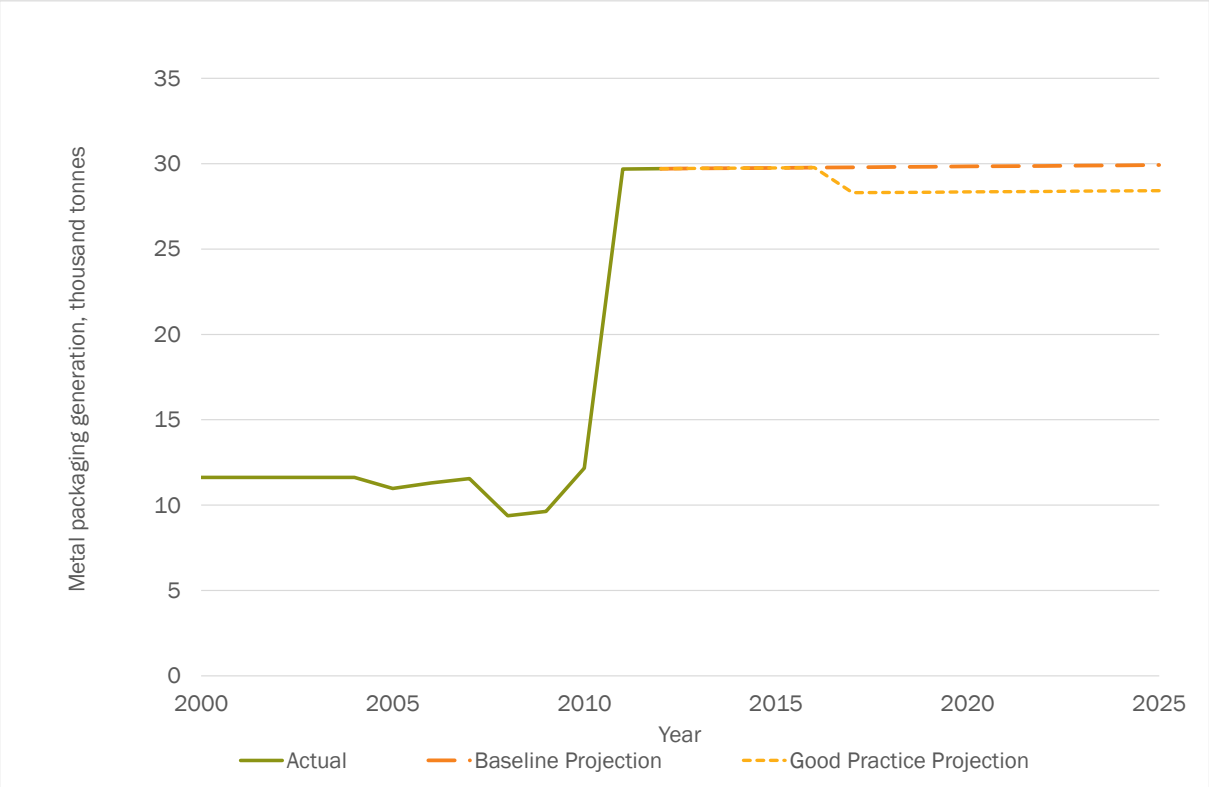


Figure 152: Change in Glass Packaging Generation, thousand tonnes

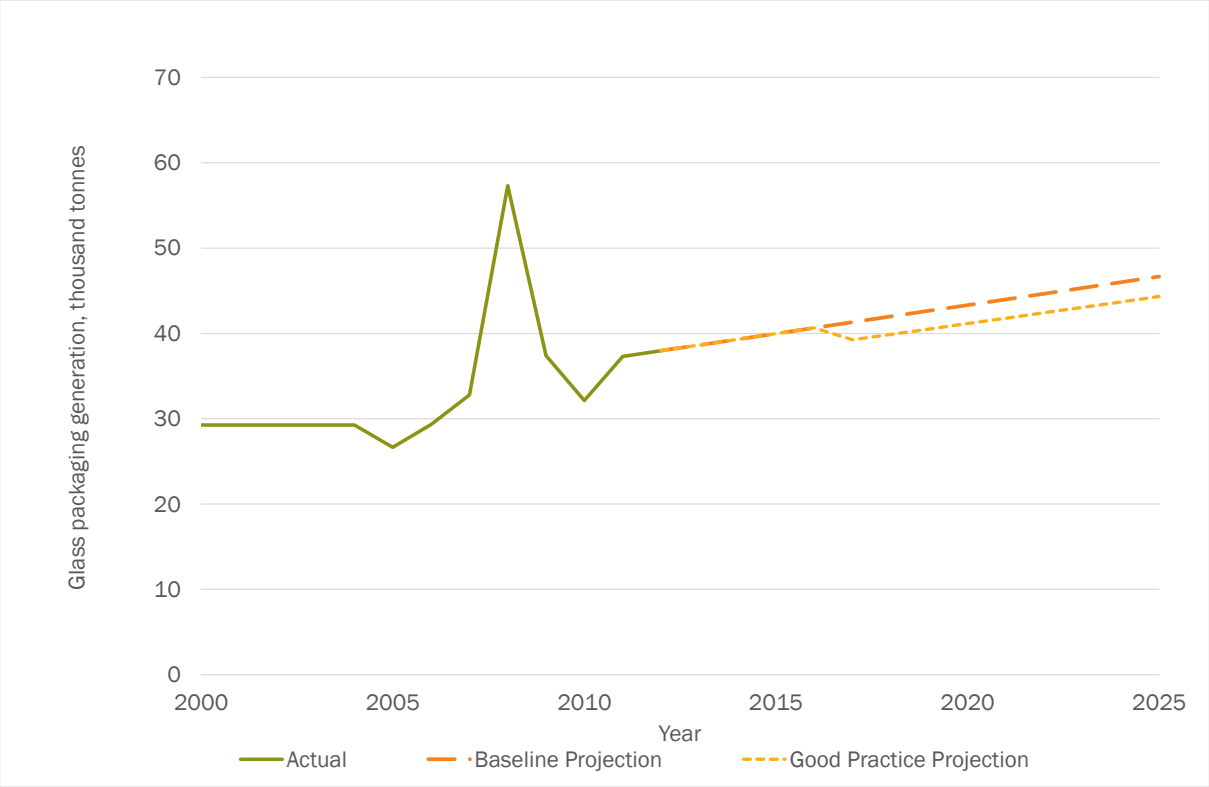
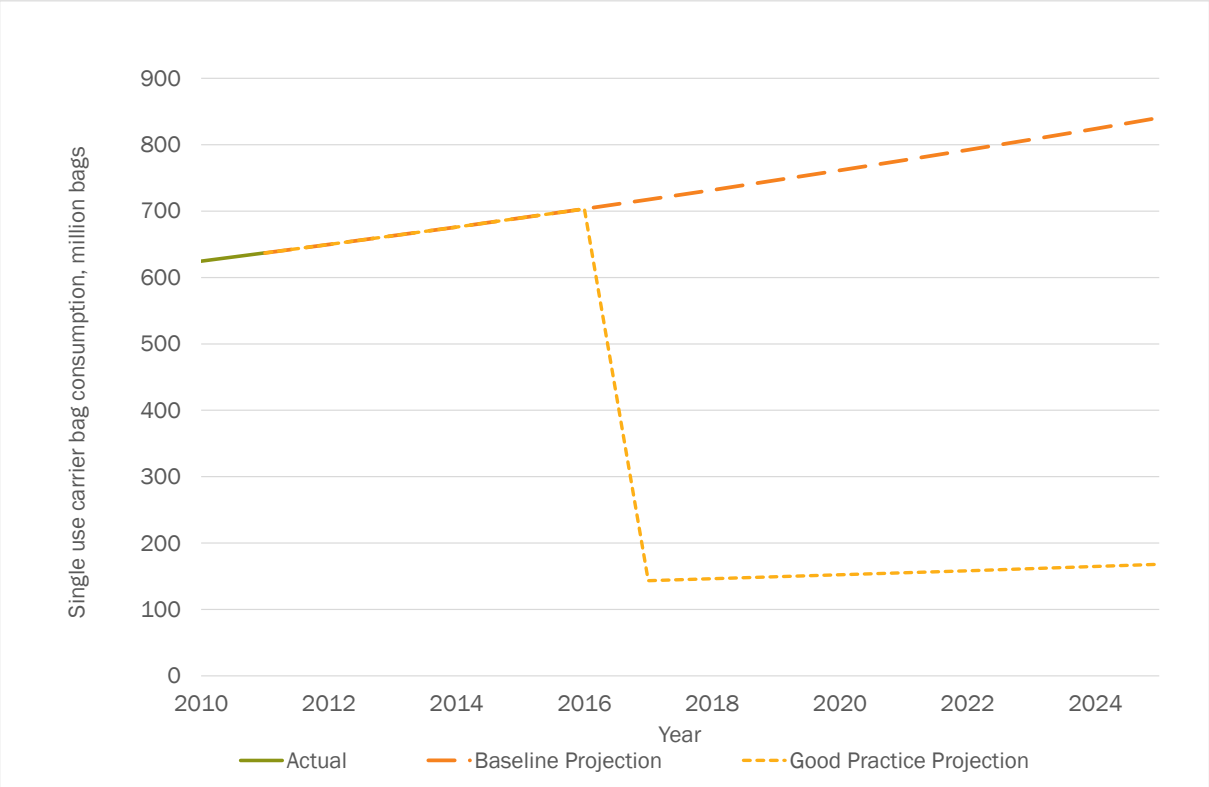


Figure 153: Change in Consumption of Single Use Carrier Bags, million bags



A.9.7 Full Revenue Outputs

Table 187: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	4	8	13	17	21	25	29	34	34	34
	C&I / Heating	0	0	7	14	21	22	23	24	26	27	27	27
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million EUR	*0*	*0*	*11*	*23*	*34*	*39*	*44*	*50*	*55*	*60*	*60*	*60*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.1%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	23	46	71	96	132	137	143	148	154	160
	Passenger Aviation Tax	0	0	35	71	74	77	80	83	86	89	92	95
	Freight Aviation Tax	0	0	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
	Sub-total Transport, million EUR	*0*	*0*	*57*	*117*	*145*	*173*	*212*	*220*	*229*	*238*	*246*	*255*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.3%*	*0.5%*	*0.7%*	*0.8%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	0	25	47	46	45	44	45	45	45	46	46

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	1	2	3	3	3	3	3	3	3	3	3
	Air Pollution Tax	0	16	31	44	55	65	60	58	57	55	54	53
	Water Abstraction Tax	0	4	9	13	17	21	21	21	21	22	22	22
	Waste Water Tax	0	0	0	1	1	1	1	1	1	1	1	1
	Pesticides Tax	0	0	1	1	1	2	2	2	2	2	2	2
	Aggregates Tax	0	0	25	22	20	17	15	15	15	16	16	16
	Packaging Tax	0	0	9	9	9	9	9	9	9	10	10	10
	Single Use Bag Tax	0	12	13	3	3	3	3	3	3	3	3	3
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	*0*	*34*	*114*	*143*	*155*	*165*	*157*	*156*	*156*	*156*	*156*	*156*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.2%*	*0.6%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.5%*
	Total, million EUR	0	34	183	282	333	377	413	427	440	454	463	472

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.2%	0.9%	1.3%	1.5%	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%	1.6%

A.10.0 France: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

A.10.1 Energy

Table 188: Standard Rates of Excise Duties on Fuels and Electricity in France

Excise Duty	Unit	Rate Applied in France	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Unleaded Petrol[1]	€ per 1000 litres	€606.90[2]	€359	€536	€515
Gas Oil (Diesel)	€ per 1000 litres	€428.40[2]	€330	€425	€412
Kerosene	€ per 1000 litres	€416.90	€330	€434	€410
Liquid Petroleum Gas	€ per 1000 kg	€107.60	€125	€197	€176
Natural Gas	€ per GJ	€0	€2.60	€2.94	€2.60
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€72	€21	€233	€242
Kerosene	€ per 1000 litres	€25.40	€21	€300	€330
Liquid Petroleum Gas	€ per 1000 kg	€46.80	€41	€134	€125
Natural Gas	€ per GJ	€0.33	€0.30	€1.90	€1.25
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€56.60	€21	€178	€122

Excise Duty	Unit	Rate Applied in France	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	€56.60	€0.00	€265	€330
Heavy Fuel Oil	€ per 1000 kg	€18.50	€15	€71	€25
Liquid Petroleum Gas	€ per 1000 kg	€0	€0.00	€78	€42
Natural Gas	€ per GJ	€0.33	€0.15	€1.38	€0.59
Coal and Coke	€ per GJ	€0.33	€0.15	€1.23	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€56.60	€21	€185	€123
Kerosene	€ per 1000 litres	€56.60	€0.00	€275	€330
Heavy Fuel Oil	€ per 1000 kg	€18.50	€15	€75	€25
Liquid Petroleum Gas	€ per 1000 kg	€0	€0.00	€110	€43
Natural Gas	€ per GJ	€0	€0.30	€2.11	€1.07
Coal and Coke	€ per GJ	€0	€0.30	€1.69	€0.32
Electricity[3]					
Business Use	€ per MWh	€17.03	€0.50	€10.23	€1.21
Non-Business Use	€ per MWh	€25.23	€1.00	€14.68	€1.91

Notes:

1. This rate is for <95 octane. The rate for "unleaded substitute petrol" is €639.60.

2. For petrol €612.5 and for gas oil (diesel) €439.5 when including a second tranche of regional surtaxes that appears not to have been included in reporting to the Commission's Excise Tables. [843]

3. Electricity: Including local and regional surtaxes – Q3-2013 according to IEA[844]

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

As part of the fuel taxes, a CO2 tax component has been introduced at €7 per tonne. The rates will increase in 2015 and 2016 to €14.5 / tonne CO_2 and €22 / tonne CO_2 , respectively.

[843] http://www.developpement-durable.gouv.fr/La-fiscalite-des-produits,11221

[844] IEA (International Energy Agency) (2013) Energy prices and taxes Q4, Paris.

A.10.2 Transport (excl. transport fuels)[845]

- Road tax - Tax payable by motorway operators:
  - Tax rate set by: central authority
  - Beneficiary: AFITF (Agence de financement des infrastructures de transport de France)
  - Rates: is set at € 7.32 per thousand kilometres travelled
  - Revenue: In 2011, revenues were EUR 576 million, equivalent to 0.03% of GDP
- Tax on public air and sea transport to and from Corsica:
  - Tax rate set by: regional authority
  - Beneficiary: regional authority
  - Rates:
    - € 4.57 per passenger landing in or disembarking from Corsica
    - € 1.52 per passenger for distances of less than 20 kilometres
  - Revenue: In 2011, revenues were EUR 41 million, equivalent to 0.00% of GDP
- Motor vehicles tax - Annual tax on company cars:
  - Tax rate set by: central authority
  - Beneficiary: social security
  - Rates:
    - For cars bought before 1st Jan 2006, the tax is based on their fiscal power (hp):
      - € 750 for cars with an engine rating of 3 hp and less for tax purposes;
      - € 1,400 for cars with an engine rating between 4 hp and 6 hp;
      - € 3,000 for cars with an engine rating between 7 hp and 10 hp;
      - € 3,600 for cars with an engine rating between 11 hp and 15 hp;
      - € 4,500 for cars with an engine rating of 15 hp and more

[845] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=38/1357119656&taxType=Other+indirect+tax

- For cars bought after 1st Jan 2006, the tax is based on the level of CO2 emissions (in g per km):
  - Less than 50, € 0 per gramme
  - Between 50 and 100, € 2 per gramme
  - Between 100 and 120, € 4 per gramme
  - Between 120 and 140, € 5.5 per gramme
  - Between 140 and 160, € 11.5 per gramme
  - Between 160 and 200, € 18 per gramme
  - Between 200 and 250, € 21.5 per gramme
  - More than 250, € 27 per gramme
- Revenue: In 2011, revenues were EUR 928 million, equivalent to 0.04% of GDP

- There are two aviation taxes, one called the Civil Aviation Tax, and the other, a Solidarity Tax on aircraft tickets. In the former case, For flights performed from April 1st 2013 (period of the flights), the rates are the following :[846]
  - 4,31 € per passenger to destinations within France, within other European Country, within other signatory State to the European Economic Area Agreement, or to Switzerland ;
  - 7,75 € per passenger to destinations within other States ;
  - 1,29 € per tons of freight or mail to any destinations.
- For the solidarity tax, there are two types of tariff applied to each of two categories of destination (see Table below). This tax is effectively part of the Civil Aviation Tax, but the revenue is allocated to the Solidarity Fund for Development (administered by the French Agency for Development), whose aim is to contribute to finance (mainly) health matters in developing countries.

Table 189: Tax Rates Under Solidarity Tax

Final destination of the passenger	Conditions in which the passenger is carried	Applicable rate	
Metropolitan France, DOM/TOM, other States members of the European Community (EC), States signatories to the European Economic Area (EEA) Agreement, Switzerland.	« First » or « business » class, or similar designation	Increased	10€
	Other classes	Normal	1€

[846] http://www.developpement-durable.gouv.fr/Civil-aviation-tax.html

Other destinations	"First" or "business" class, or similar designation	Increased	40€
	Other classes	Normal	4€

Source: http://www.developpement-durable.gouv.fr/Solidarity-tax-on-aircraft-tickets.html

A.10.3 Pollution and Resources[847]

- Pollution tax:
  - Tax rate set by:
  - Beneficiary: This tax goes to the central authority and to ADEME (Agence de l'environnement et de la maîtrise de l'énergie)
  - Tax object / assessment:
    - The basis of assessment and rates are designed as a guide for business, in order to alter and prevent behaviour that presents the greatest environmental risks – 'polluter pays principle'
  - Rates:
    - Storage of household and allied waste, elimination of special industrial waste: from € 4 to € 100 per tonne, depending on the management of waste.
    - Atmospheric emissions of polluting substances: in most cases, from € 43.24 to € 259.86 per tonne.
    - Waste oil production: € 44.02 per tonne.
    - Release for consumption and supply on the domestic market of natural mineral grains: the tax is levied according to the weight of natural mineral grains: € 0.20 per tonne.
    - Release for consumption and supply on the domestic market of preparations for soap powders and fabric softeners: from € 39.51 to € 283.65 per tonne, depending on the phosphate strength.
    - Licence to operate and the operations of industrial and business establishments which present particular environmental risks:

[847] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=38/1357119656&taxType=Other+indirect+tax

- When the business is established: from € 501.61 for small businesses with less than two employees to € 2,525.35 for most other businesses.
- Every year: € 339.37 (certified establishment) or € 380.44 (others)
- Plastic bags delivered in supermarkets: € 10 per kilogramme.

- Revenue: In 2011, revenues were EUR 524 million, equivalent to 0.02% of GDP

➢ Special duty on oils intended for human consumption (this is a consumption tax):

- Tax rate set by: central authority
- Beneficiary: social security
- Rates: see table below

	in € per 100 kg	in € per 100 litres
Olive oil	18.295	16.472
Groundnut oil and maize oil	16.472	14.998
Rapeseed oil and grape seed oil	8.439	7.683
Other liquid vegetable oils and oils from marine fauna of which the trade and use are not subject to international or national rules relating to protected species	14.379	12.535
Coconut oil and palm-kernel oil	10.969	
Palm oil	10.046	
Oil from marine fauna in cases where the marketing and use of products from such fauna are subject to national or international rules relating to protected species	18.304	

- Revenue: In 2011, revenues were EUR 126 million, equivalent to 0.01% of GDP

➢ Tax on the removal of household refuse:

- Tax rate set by: local authority
- Beneficiary: local authority
- Rates: The rate depends on the amount to be collected, which is set by the local authorities
- Revenue: no data

A.10.4 Change in Tax Bases

Table 190: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	32,897	31,782	-1,116
Petrol	million litres	5,892	5,892	0
Kerosene	million litres	5,048	5,048	0
LPG	thousand tonnes	81	62	-18
Heavy Fuel Oil	thousand tonnes	711	692	-19
Natural Gas	TJ (GCV)	439,697	426,292	-13,404
Coal	thousand tonnes	4,037	3,711	-326
Electricity	GWh	361,311	353,547	-7,764

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[848] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some

[848] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

Figure 154: Change in Internal Passenger Flights, flights per year

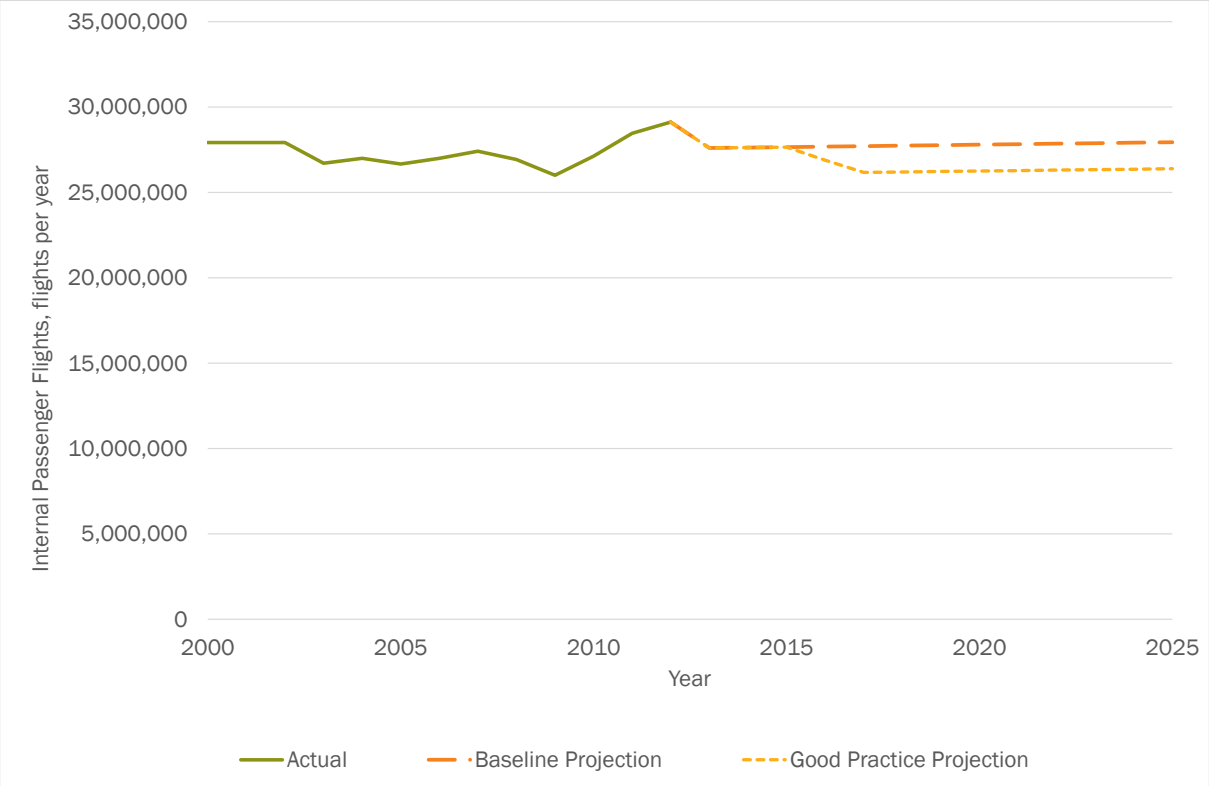


Figure 155: Change in Intra-EU Passenger Flights, flights per year

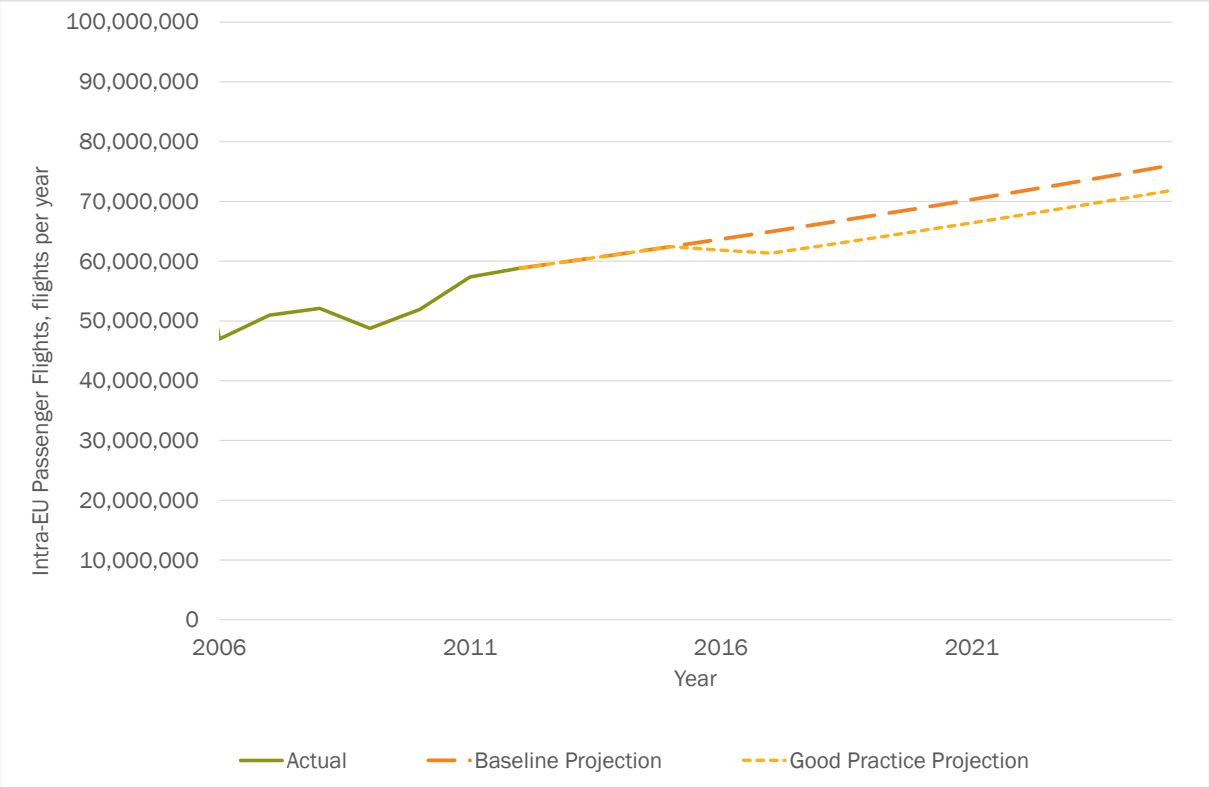


Figure 156: Change in Extra-EU Passenger Flights, flights per year

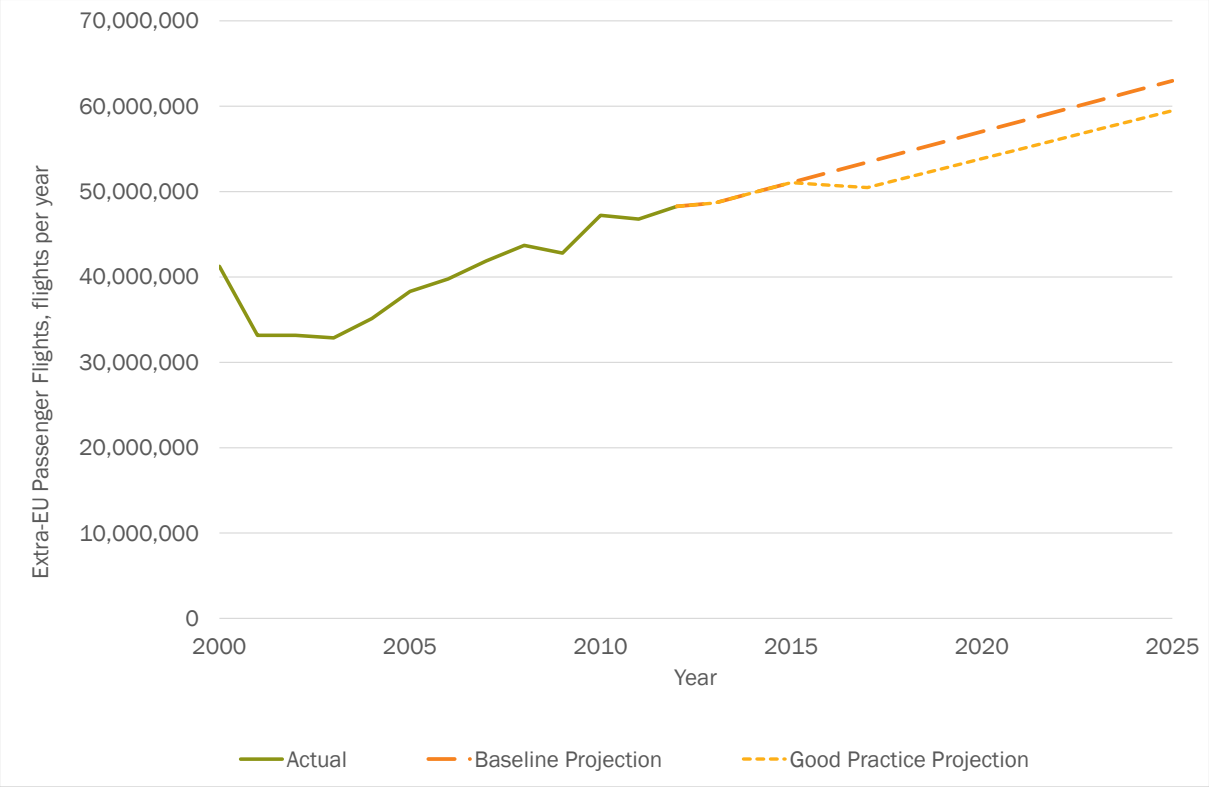


Figure 157: Change in Internal Air-freight, tonnes

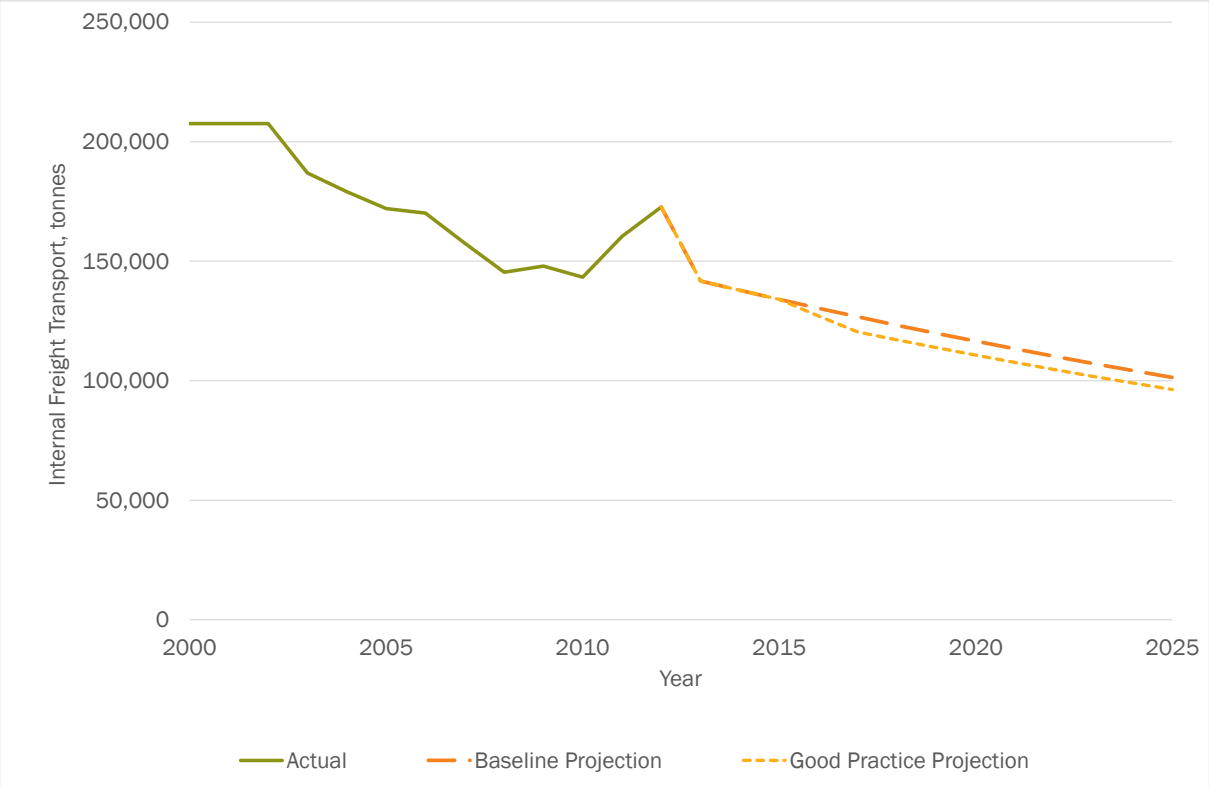


Figure 158: Change in Intra-EU Air-freight, tonnes

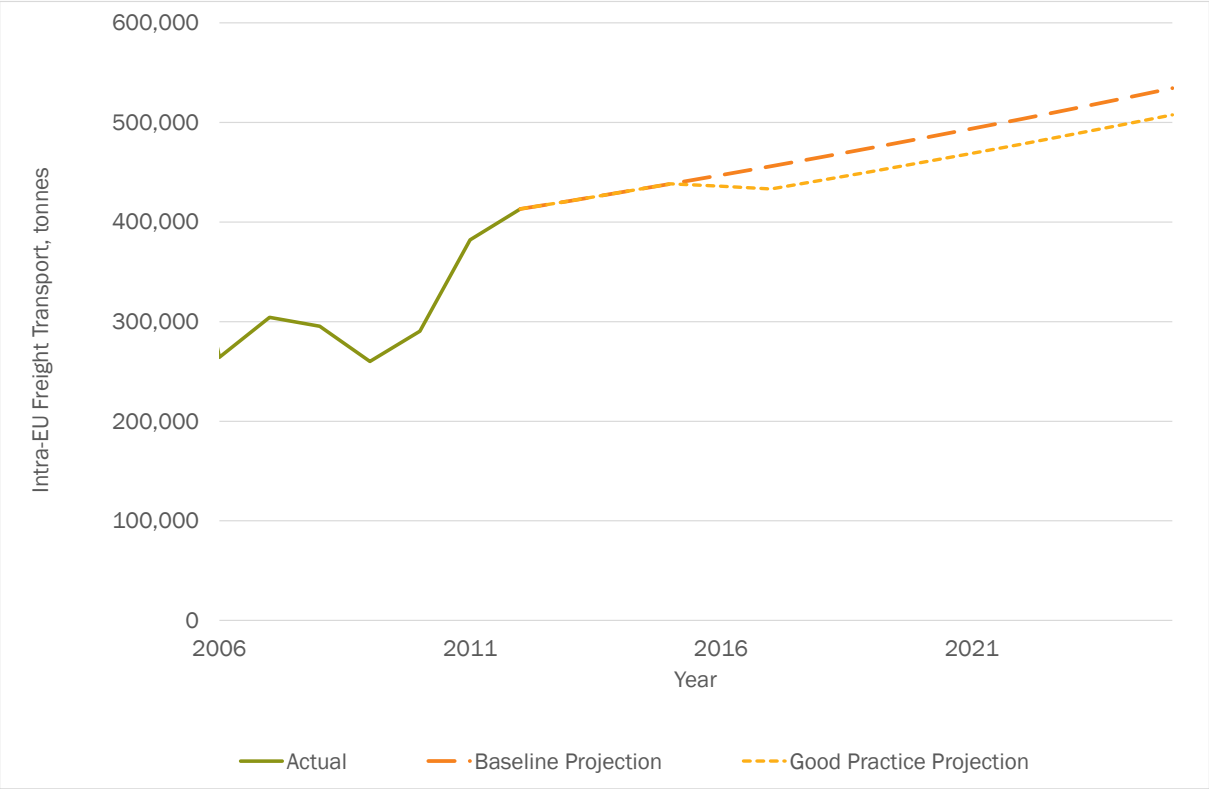


Figure 159: Change in Extra-EU Air-freight, tonnes

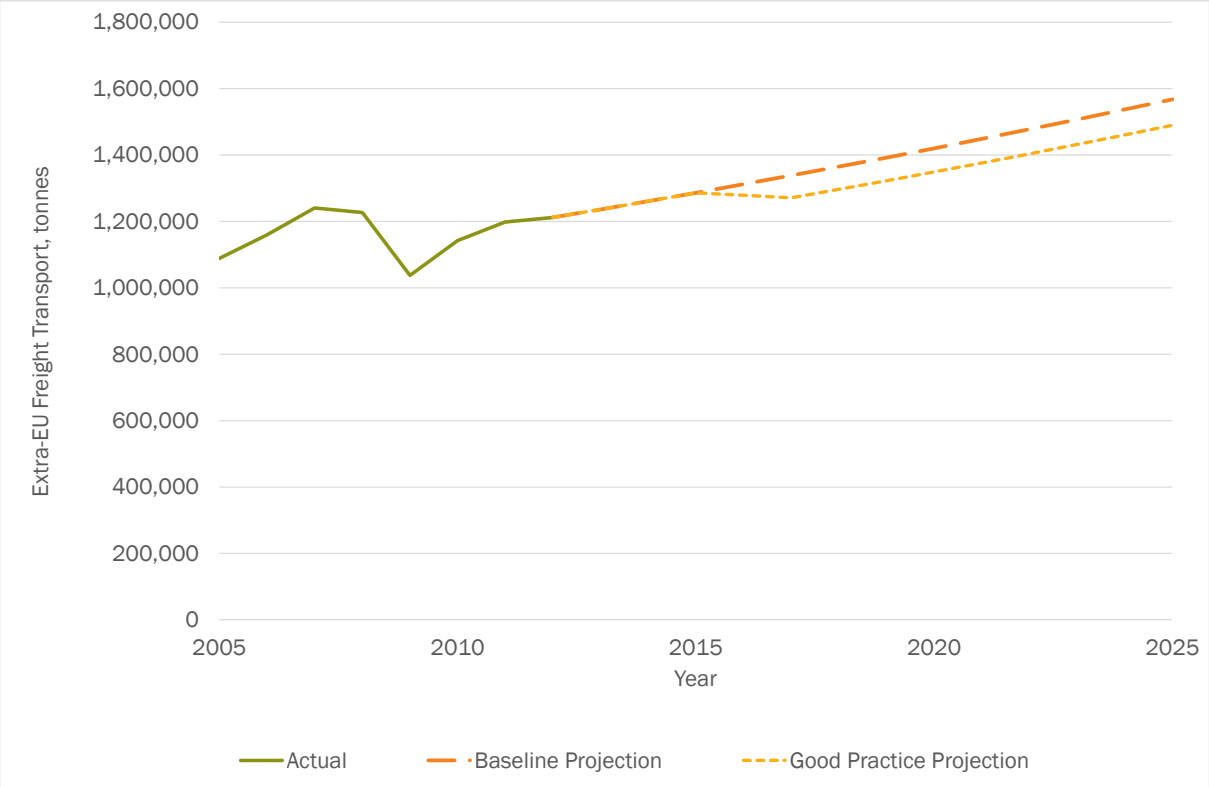


Figure 160: Change in Non-Hazardous Waste Landfilled, thousand tonnes

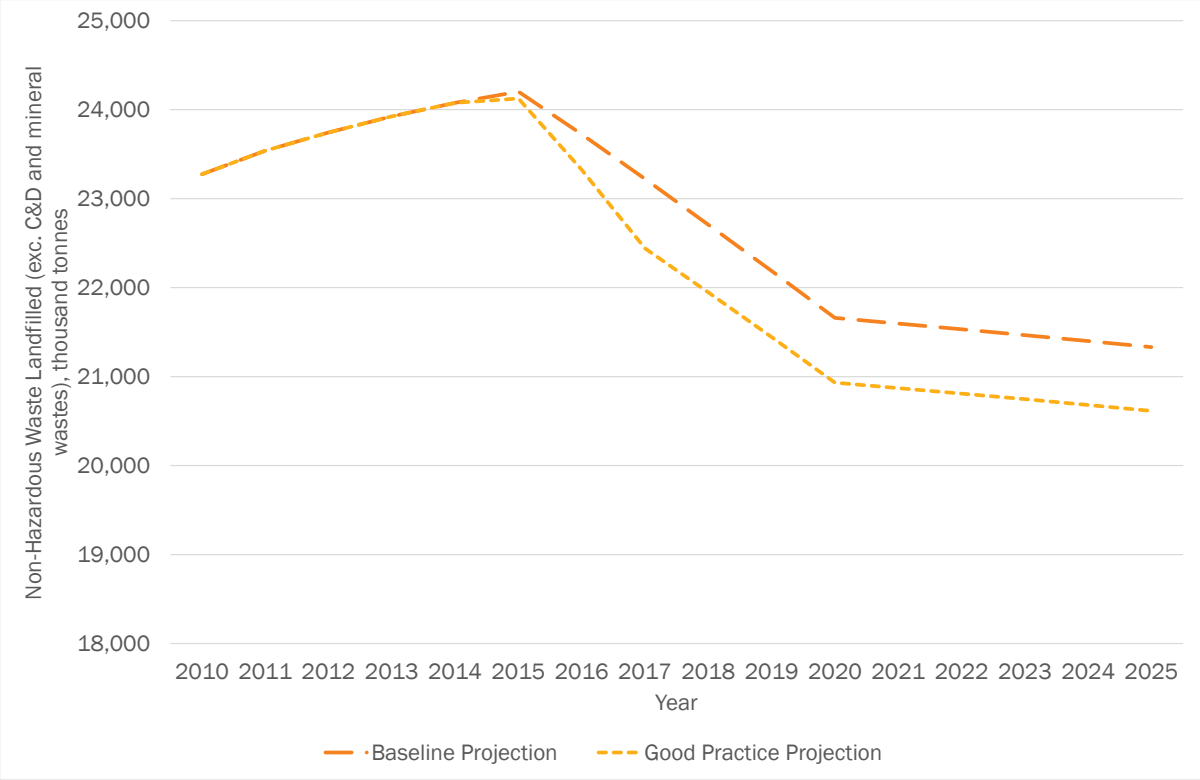


Figure 161: Change in SOx Emissions, tonnes

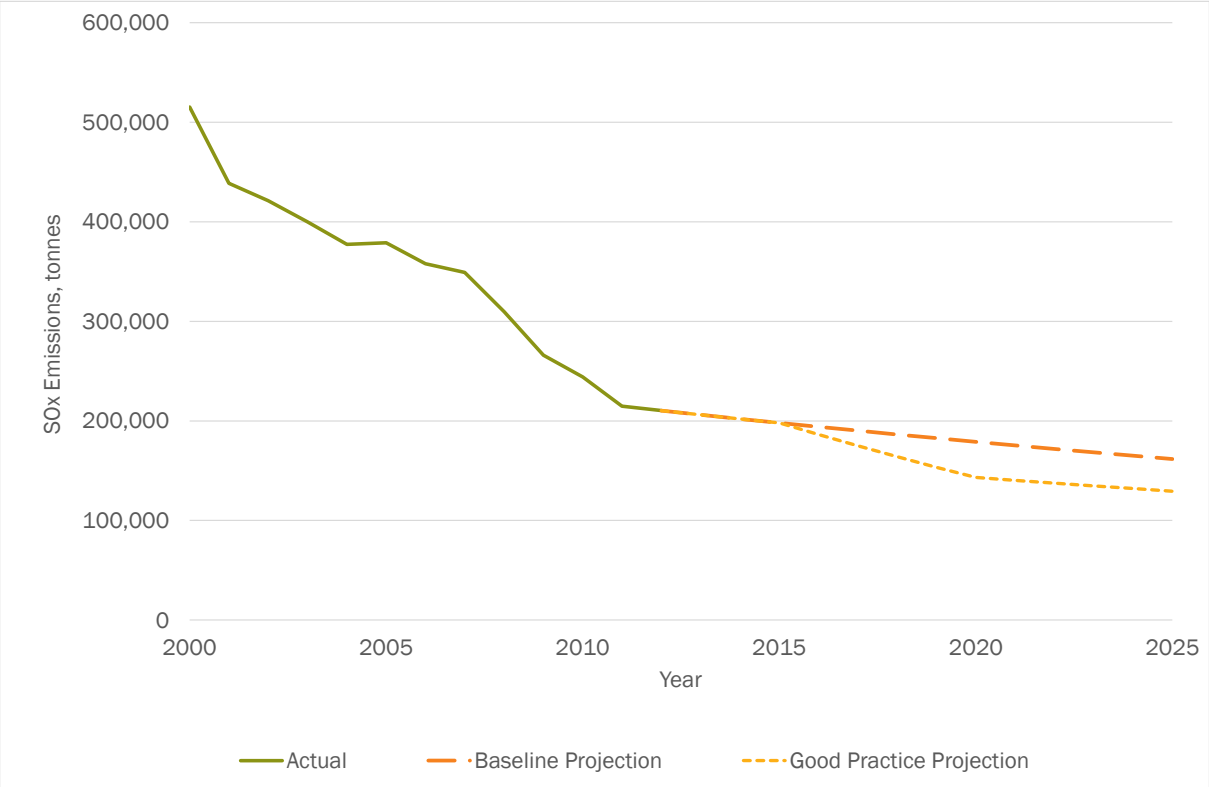


Figure 162: Change in NOx Emissions, tonnes

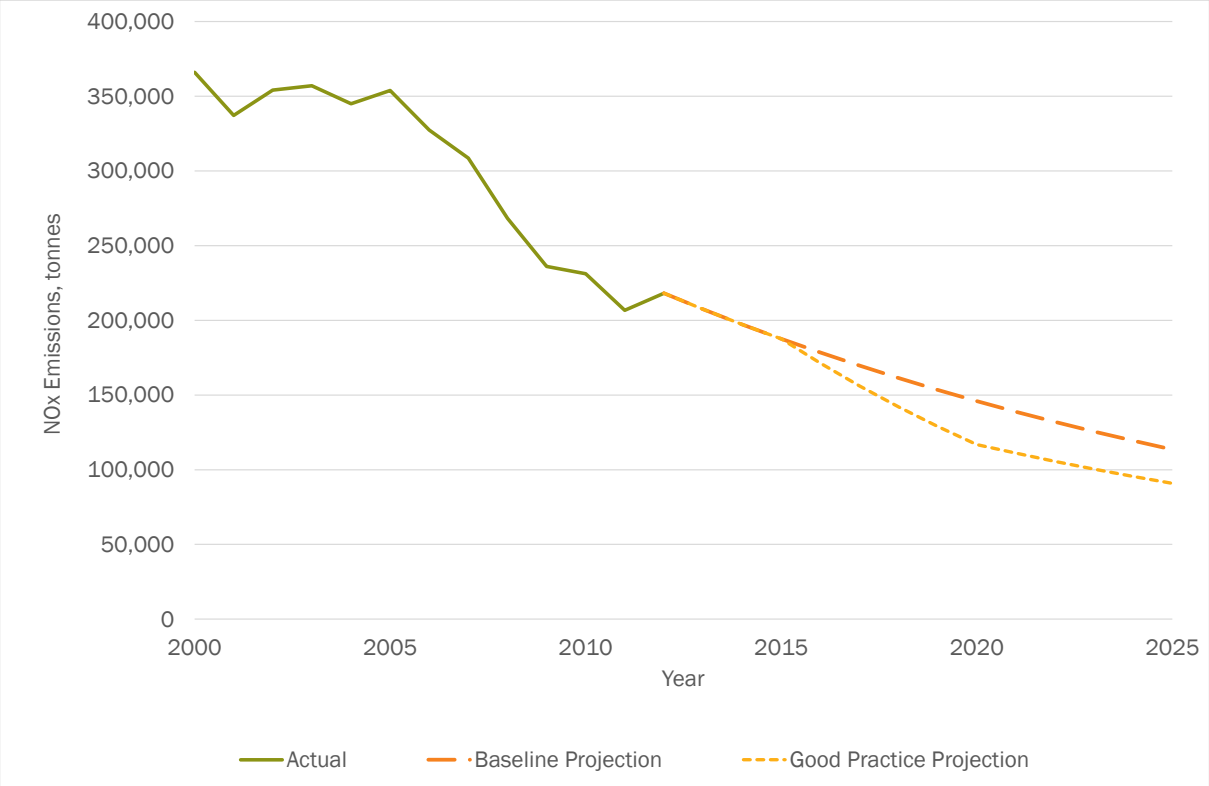


Figure 163: Change in PM_{10} Emissions, tonnes

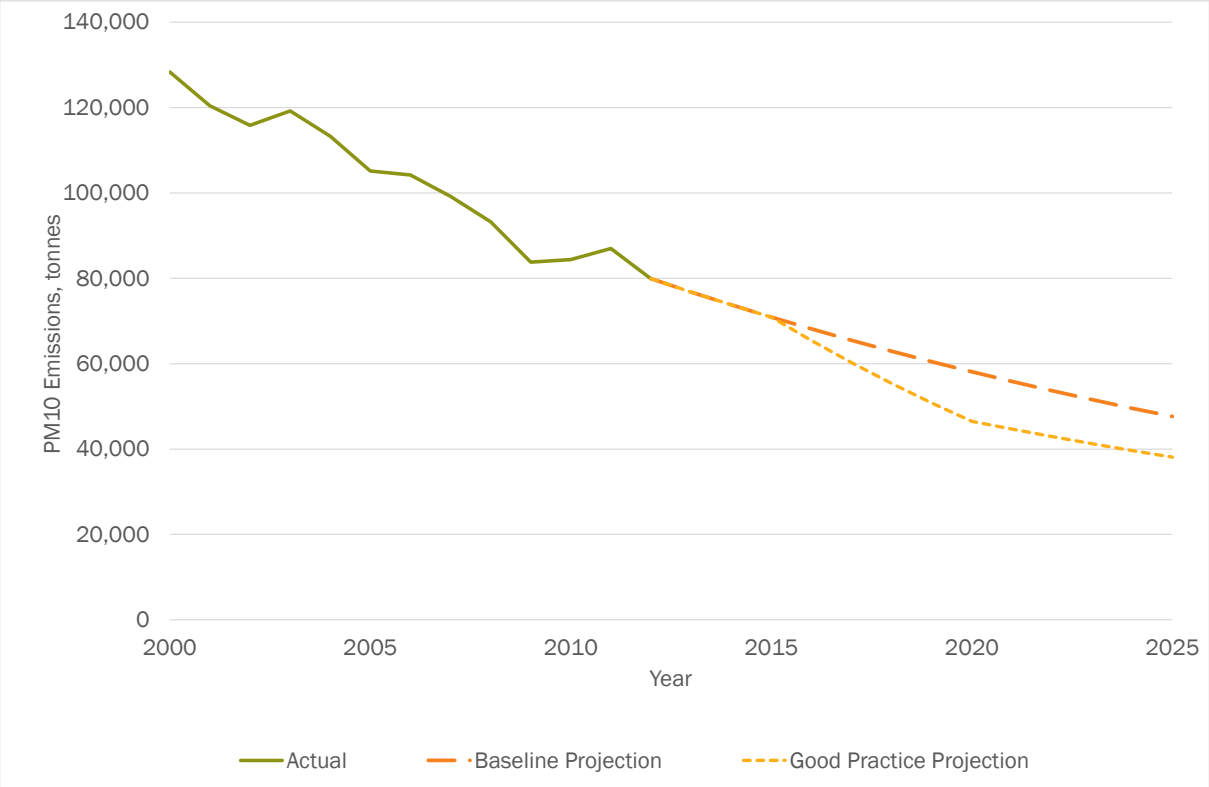


Figure 164: Change in Groundwater Abstraction – Public Supply, million cubic metres

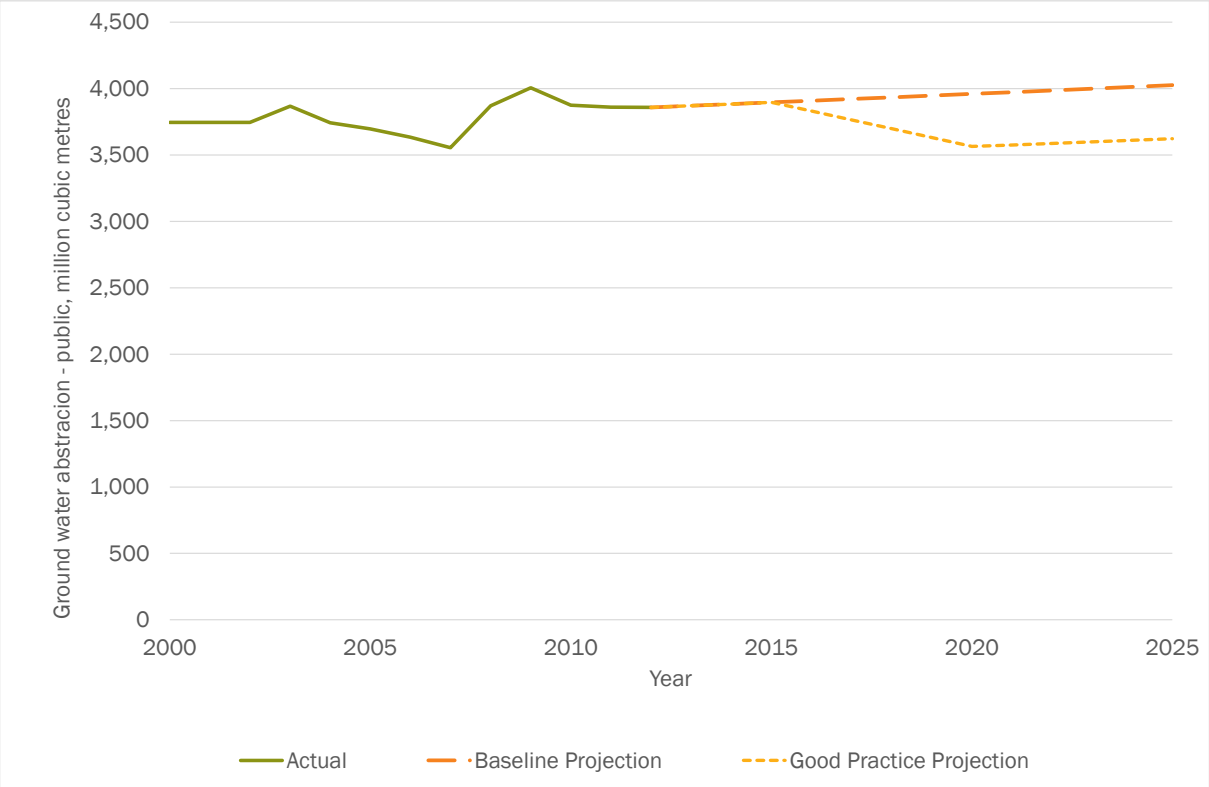


Figure 165: Change in Groundwater Abstraction – Manufacturing, million cubic metres

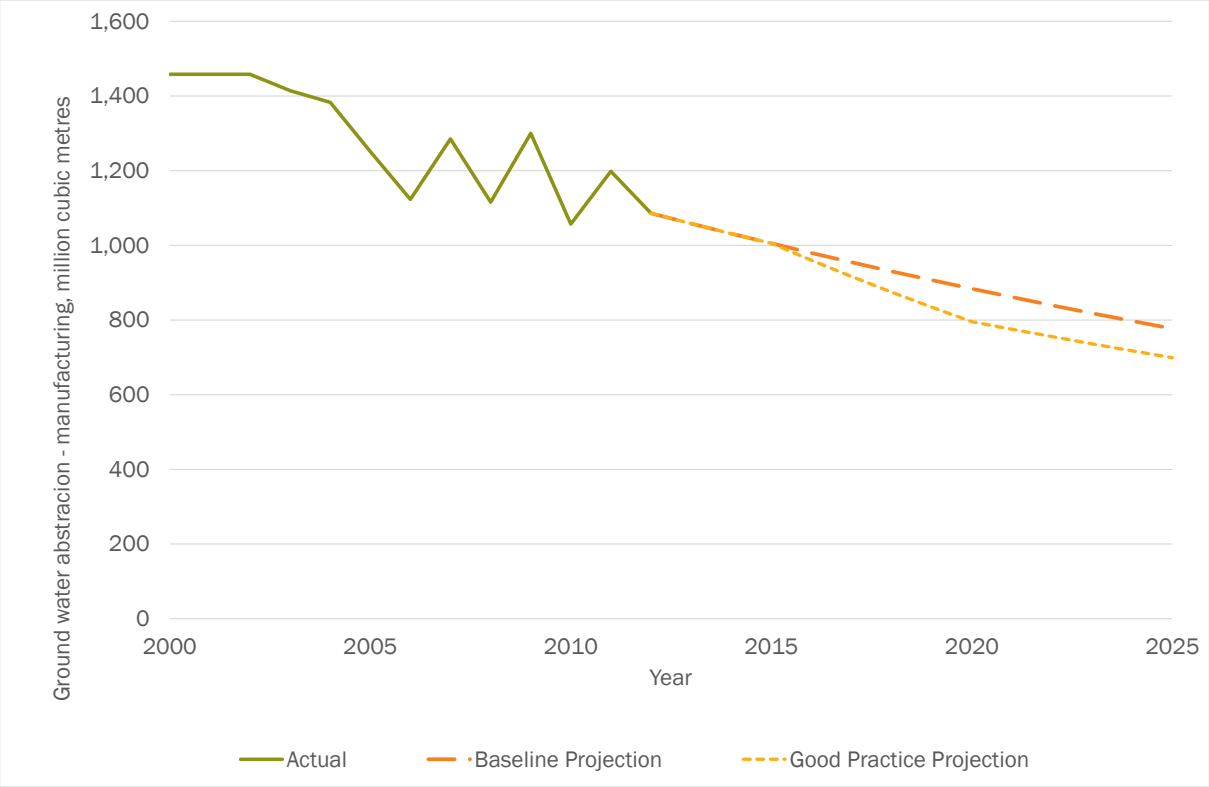


Figure 166: Change in Groundwater Abstraction – Agriculture, million cubic metres

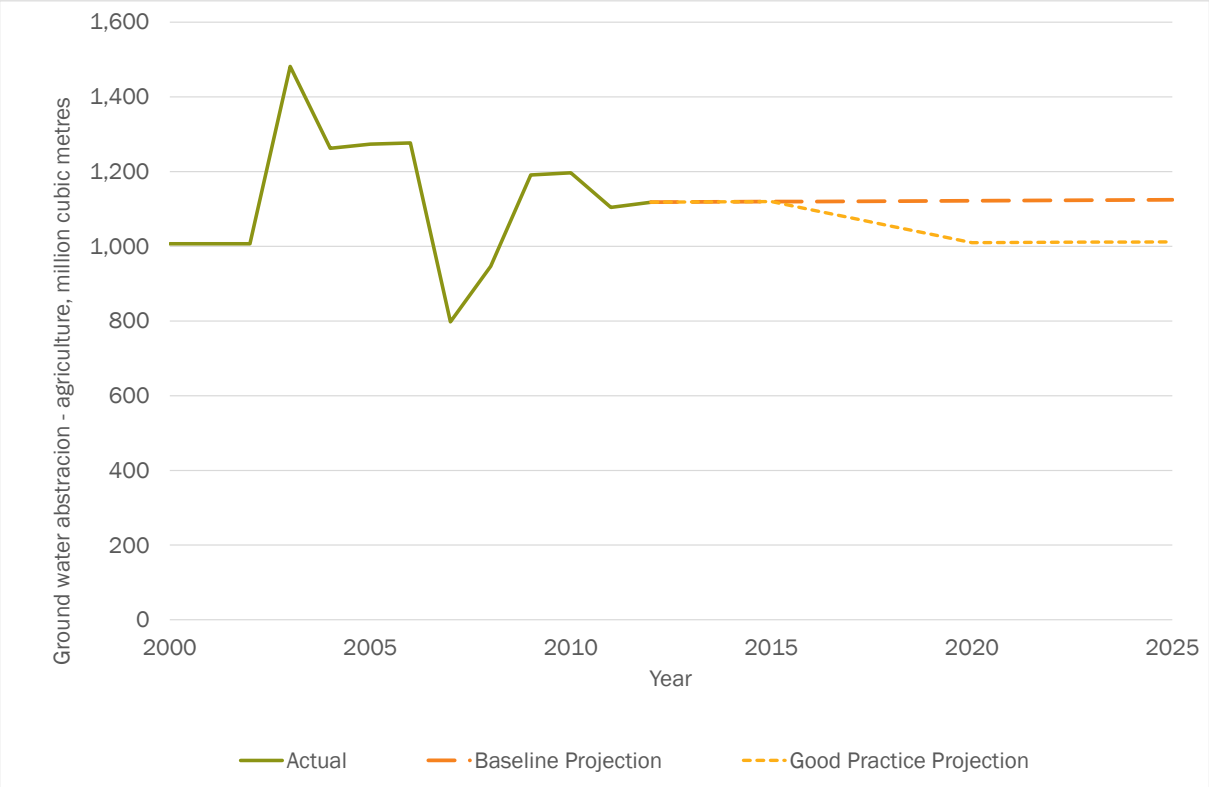


Figure 167: Change in Surface Water Abstraction – Public Supply, million cubic metres

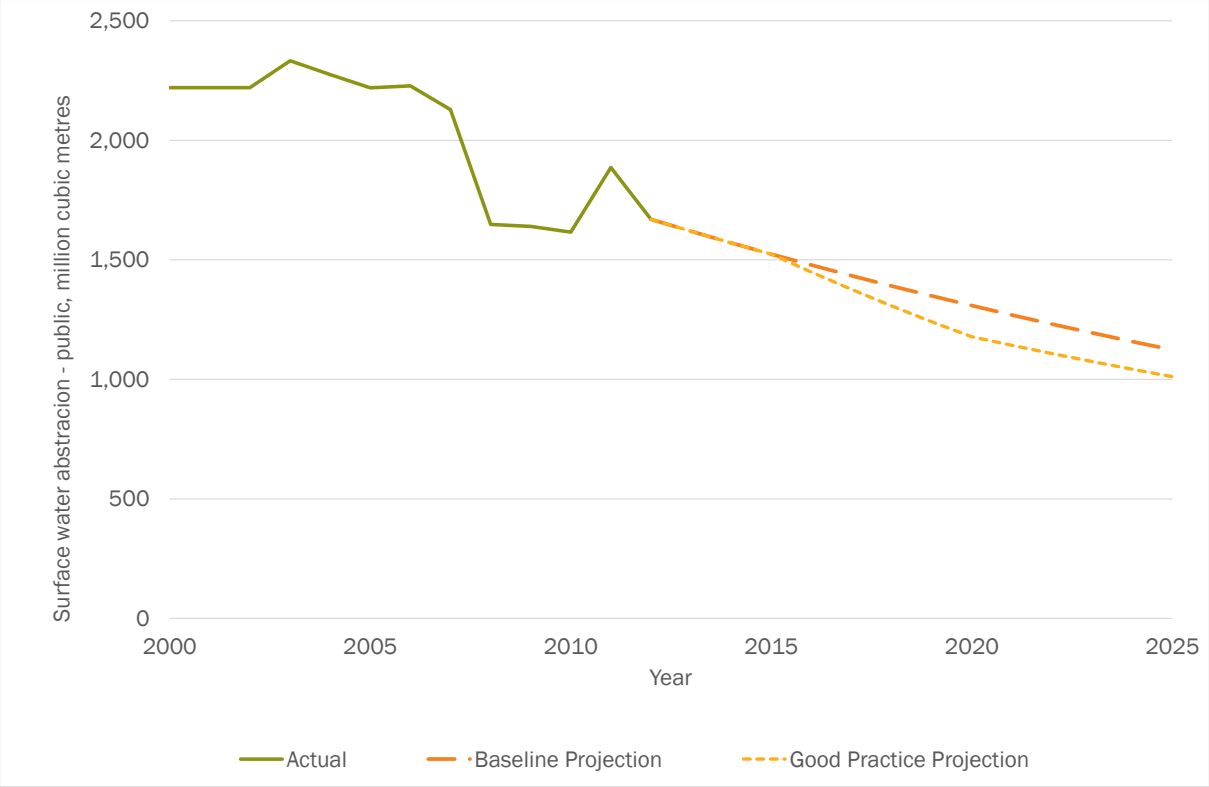


Figure 168: Change in Surface Water Abstraction – Manufacturing, million cubic metres

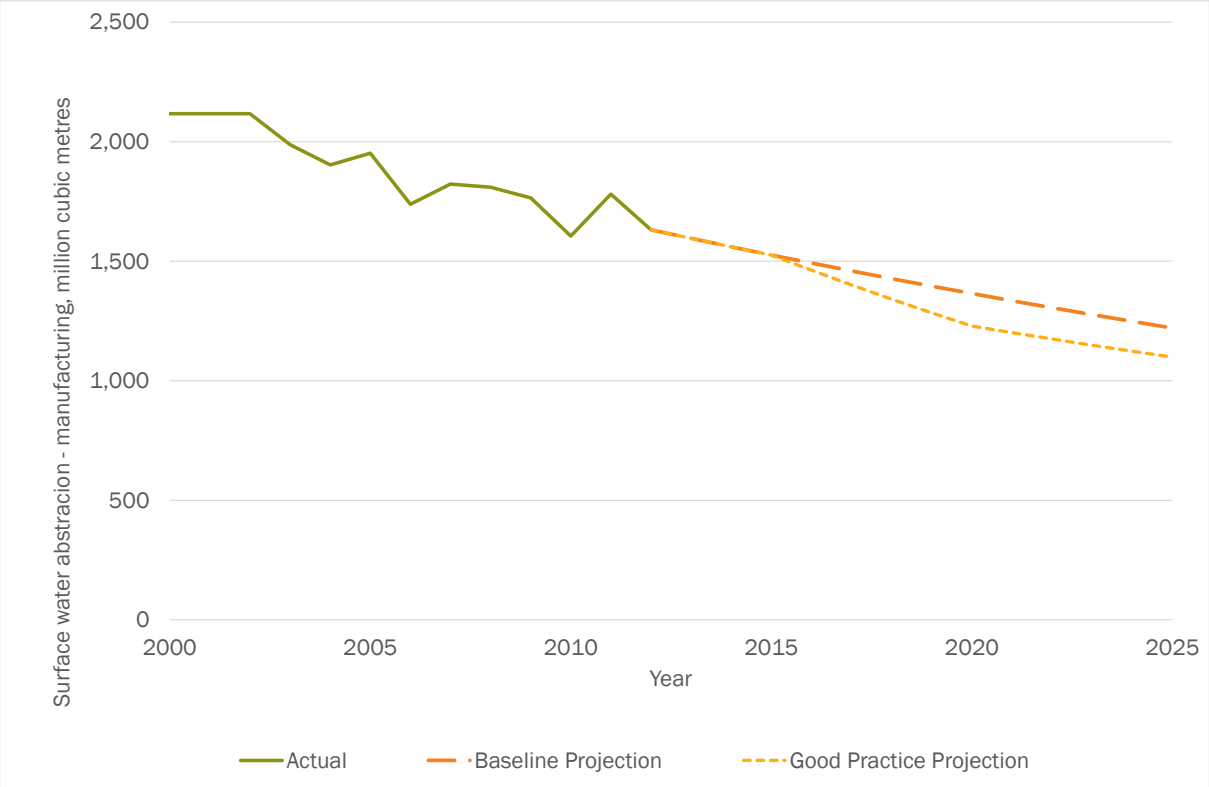


Figure 169: Change in Surface Water Abstraction – Agriculture, million cubic metres

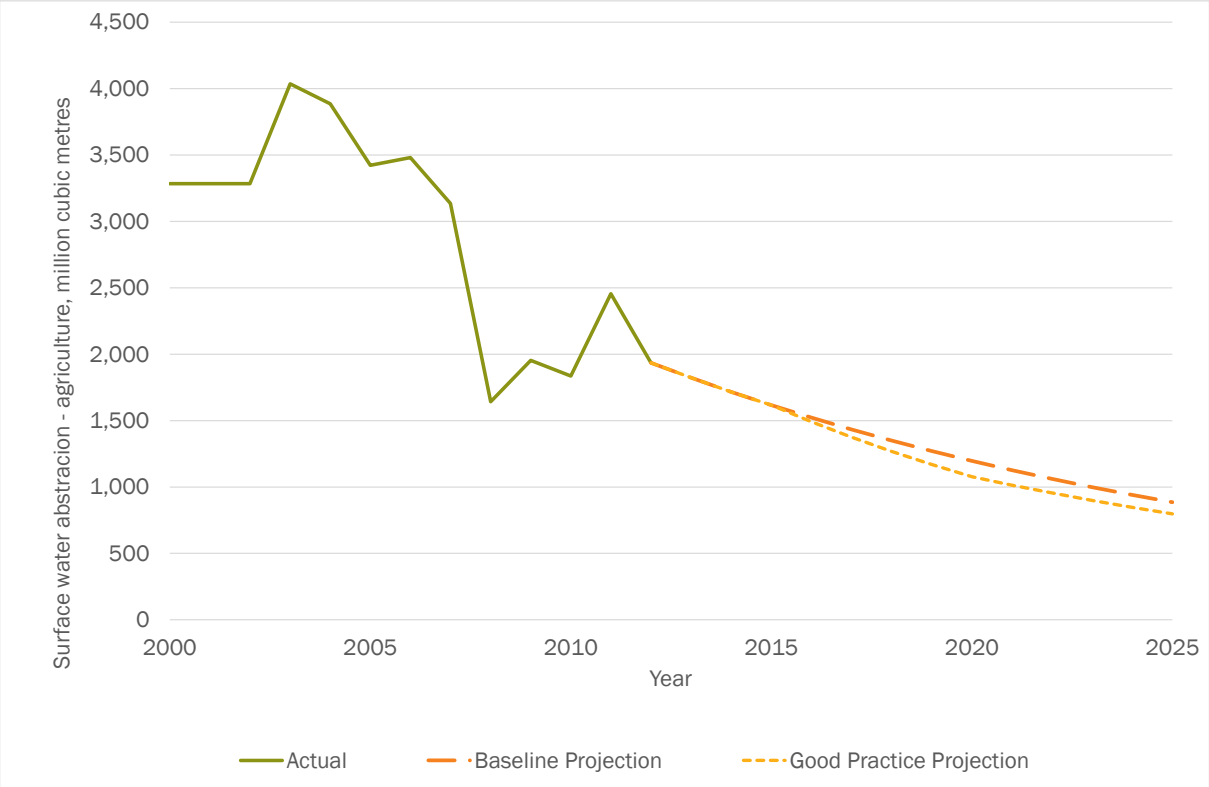


Figure 170: Change in Active Ingredients in Pesticides, tonnes

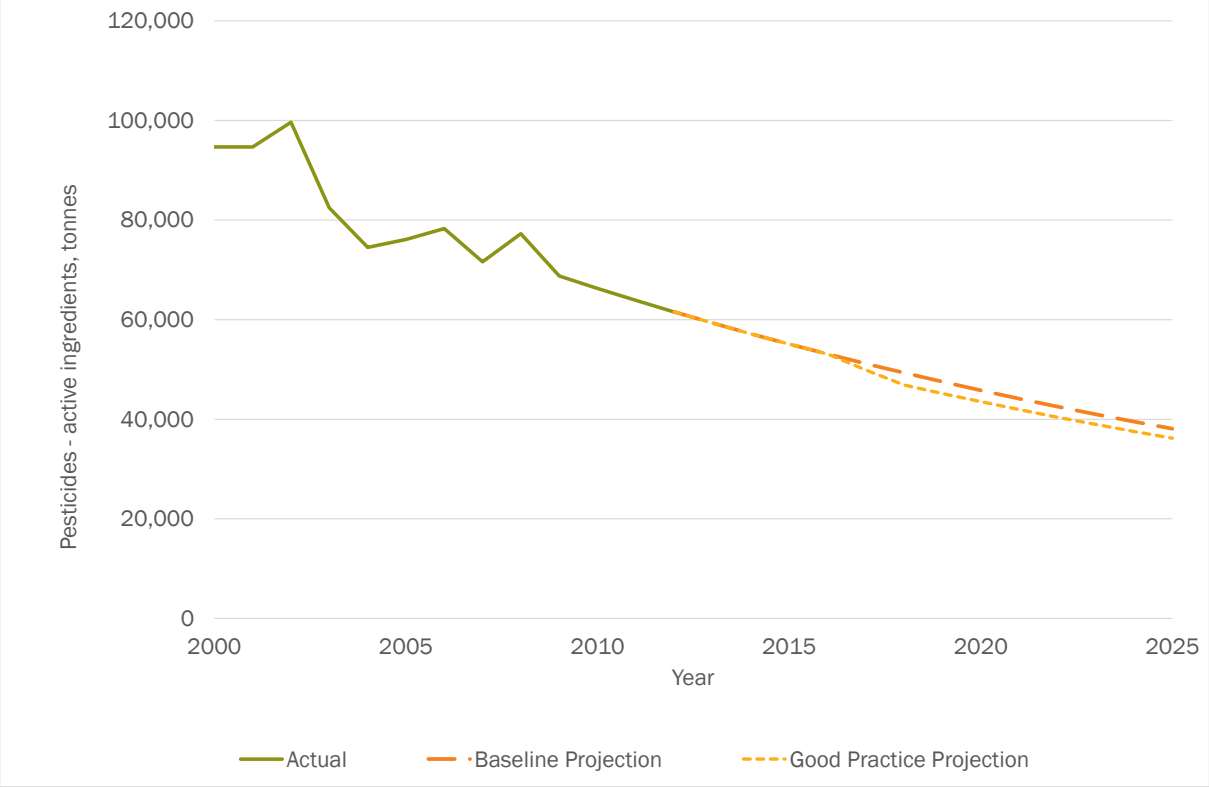


Figure 171: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

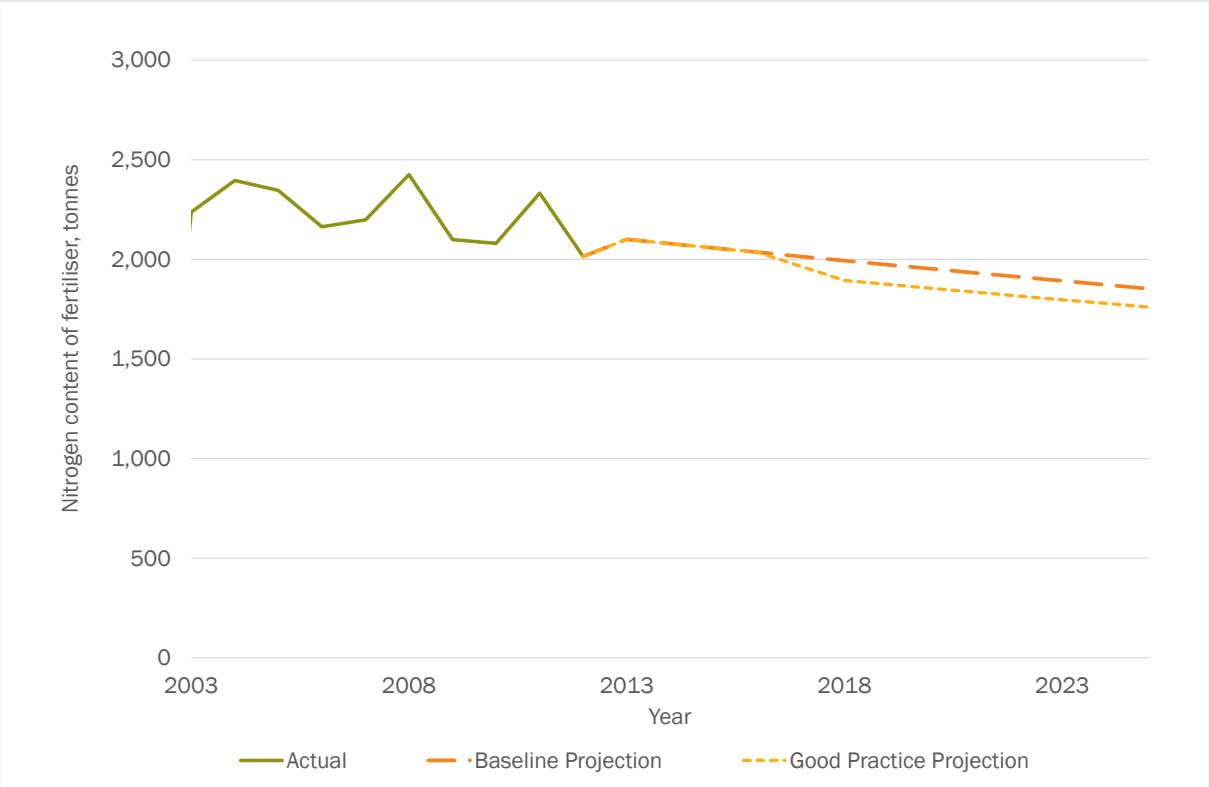


Figure 172: Change in Aggregates Extraction, thousand tonnes

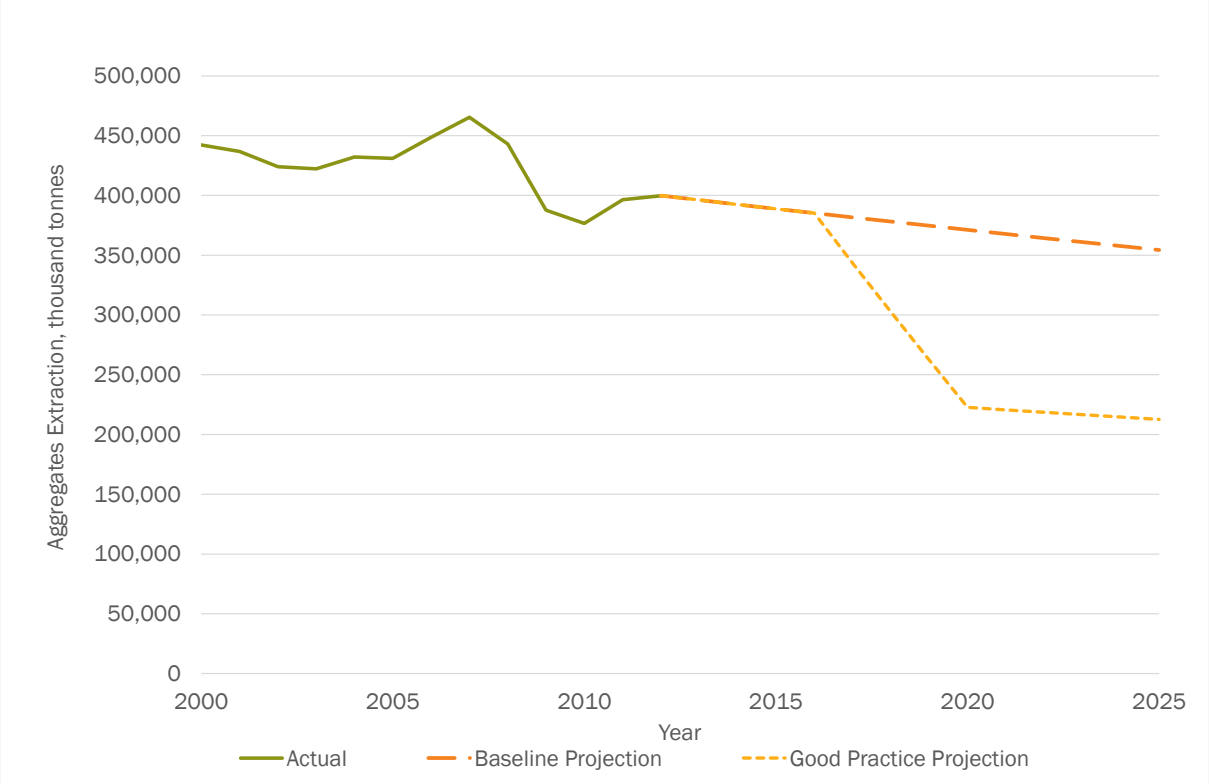


Figure 173: Change in Paper & Card Packaging Generation, thousand tonnes

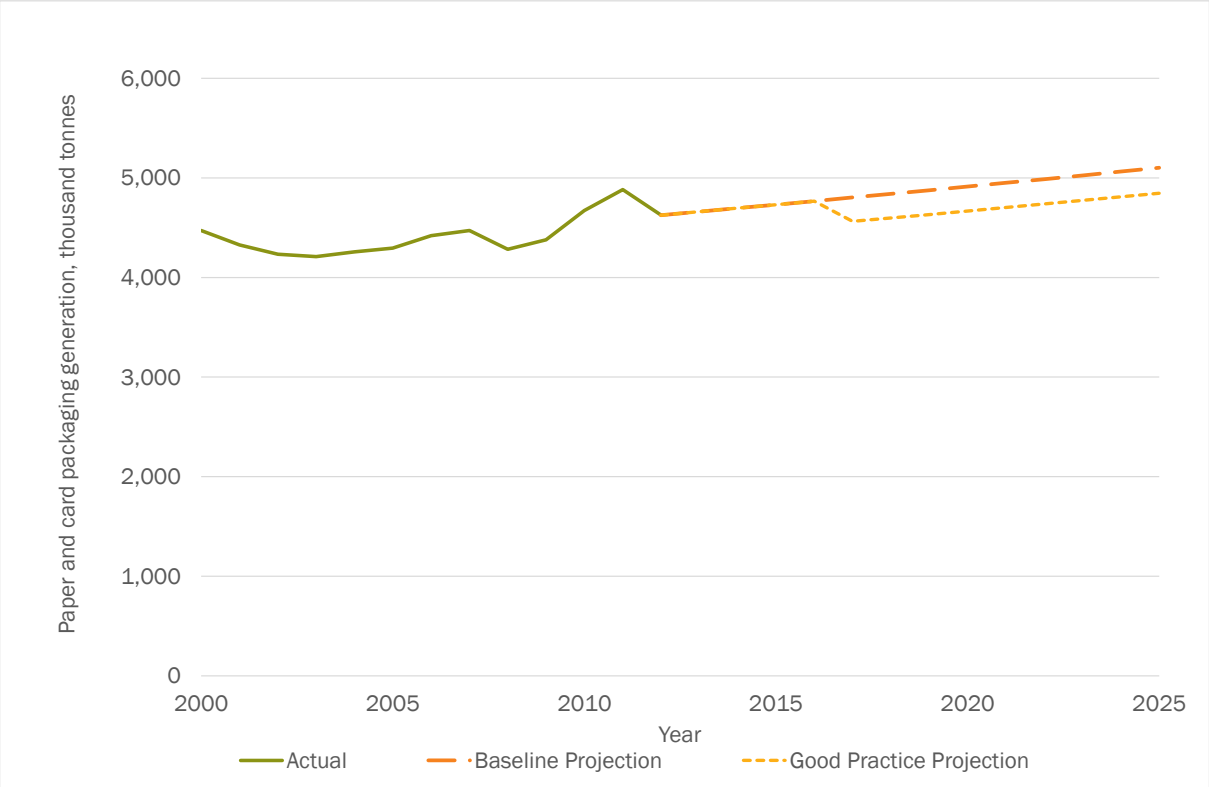


Figure 174: Change in Plastic Packaging Generation, thousand tonnes

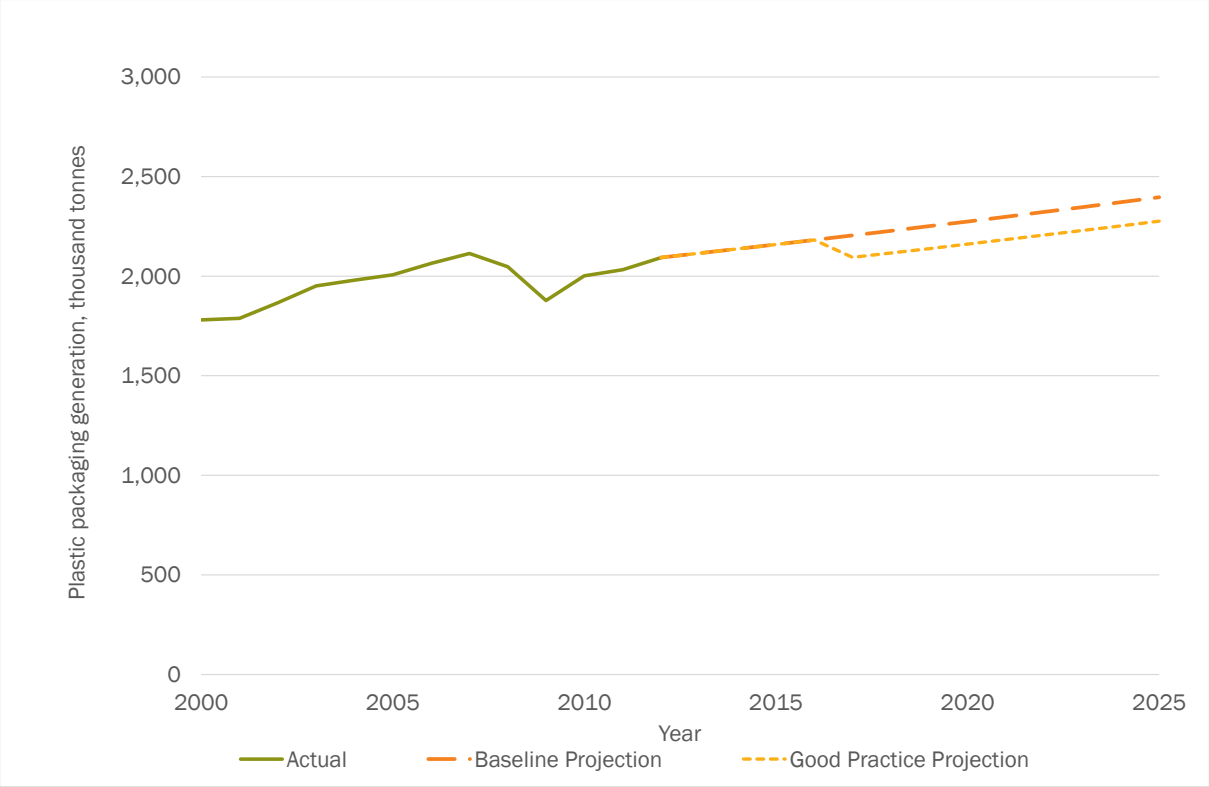


Figure 175: Change in Wood Packaging Generation, thousand tonnes

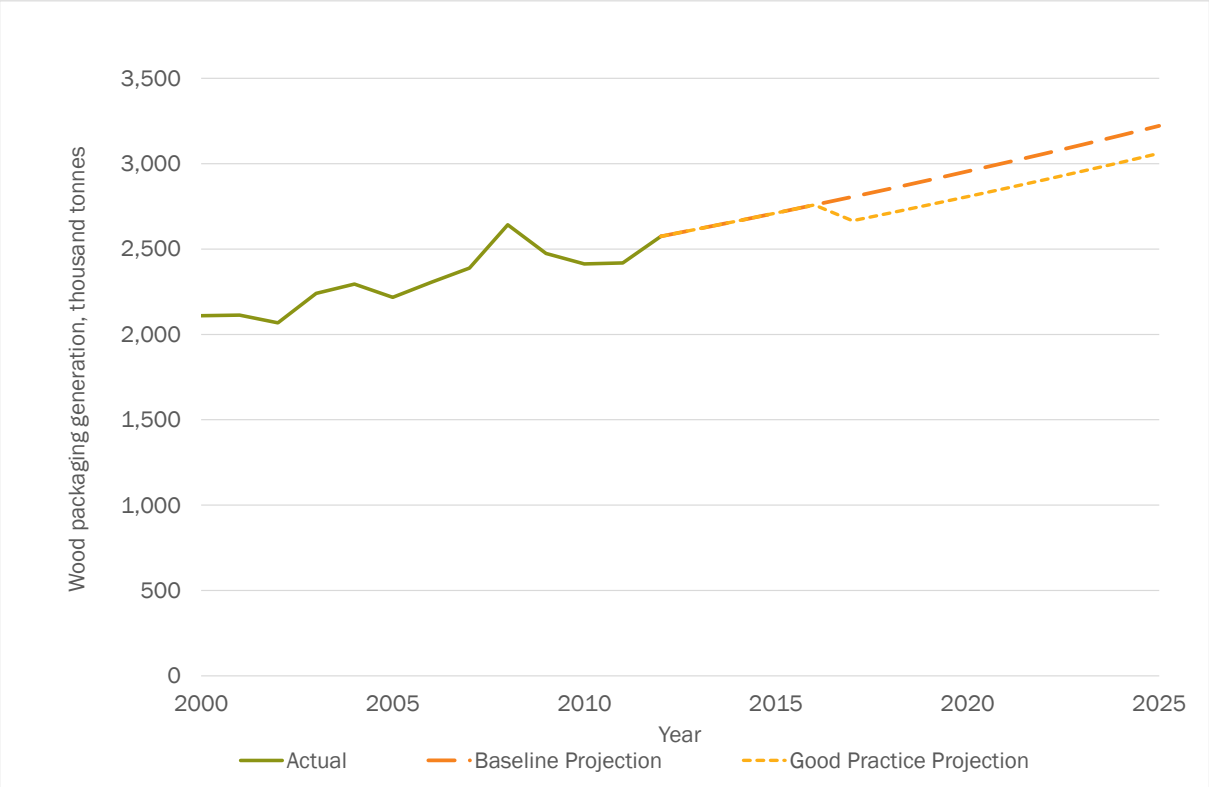


Figure 176: Change in Metal Packaging Generation, thousand tonnes

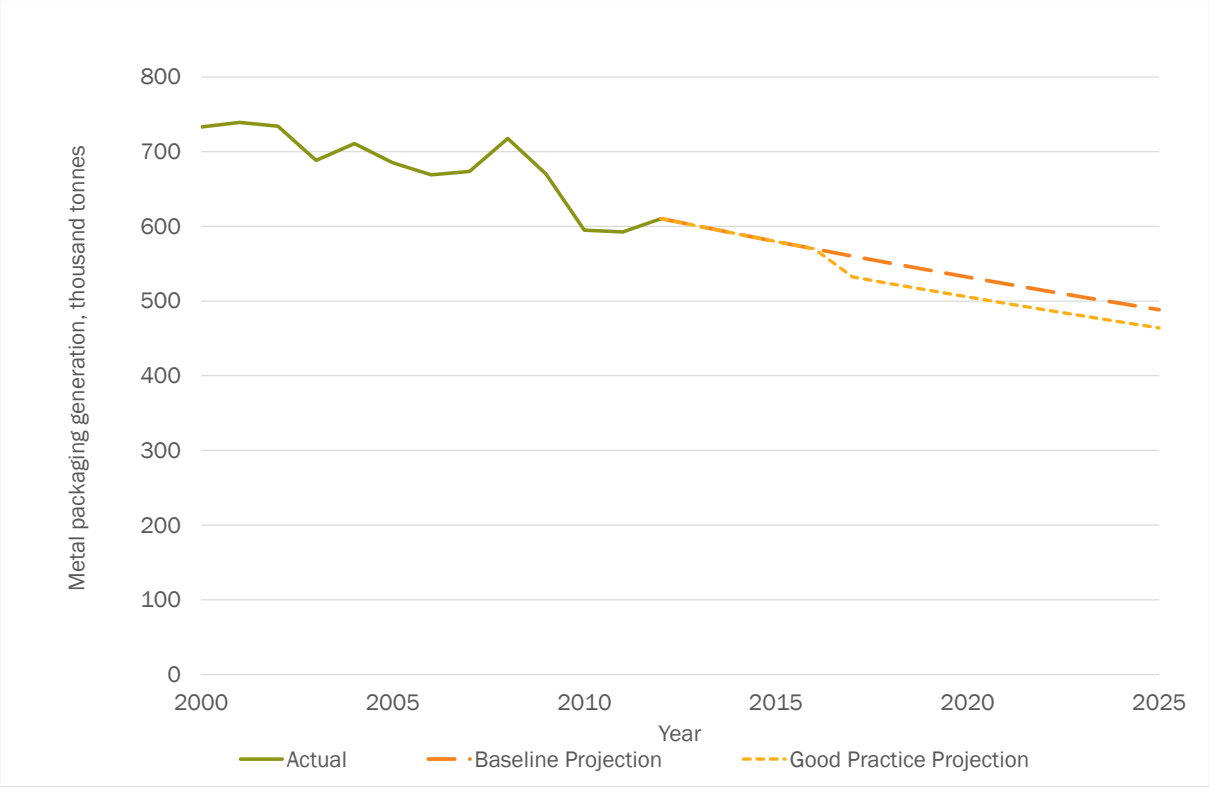


Figure 177: Change in Glass Packaging Generation, thousand tonnes

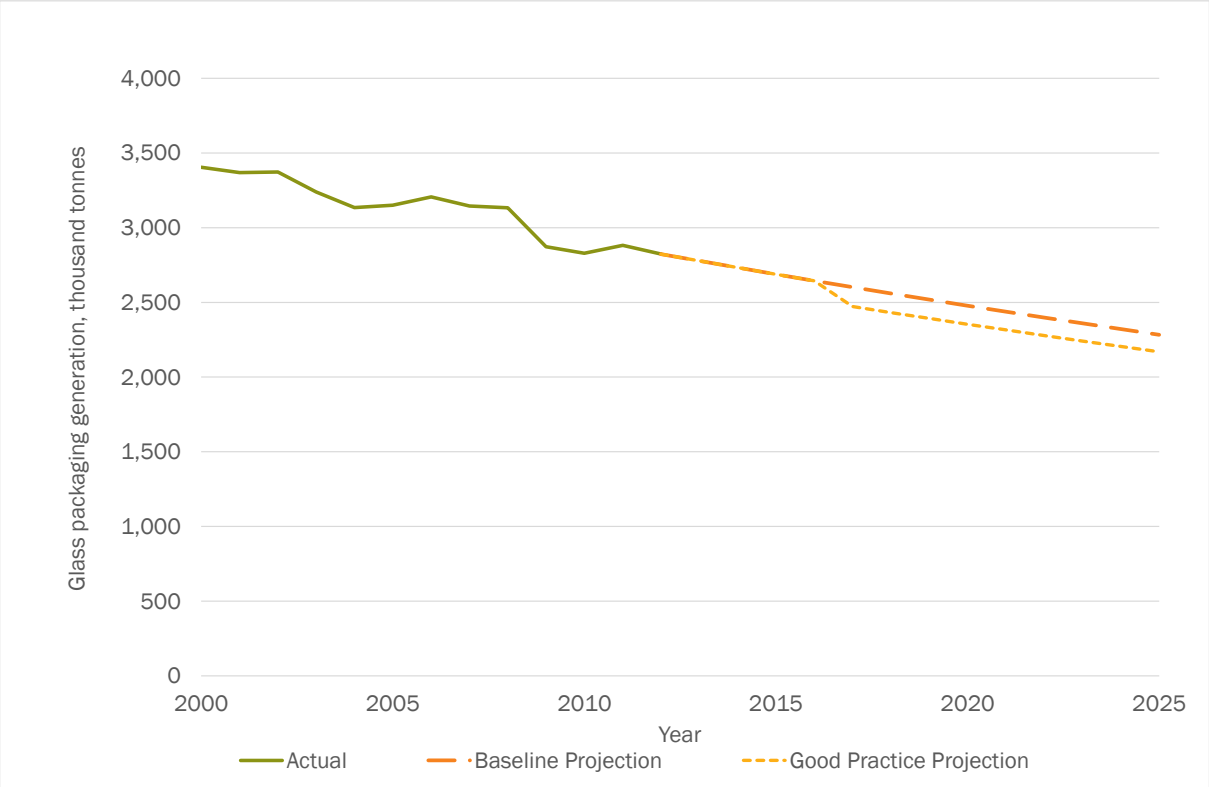
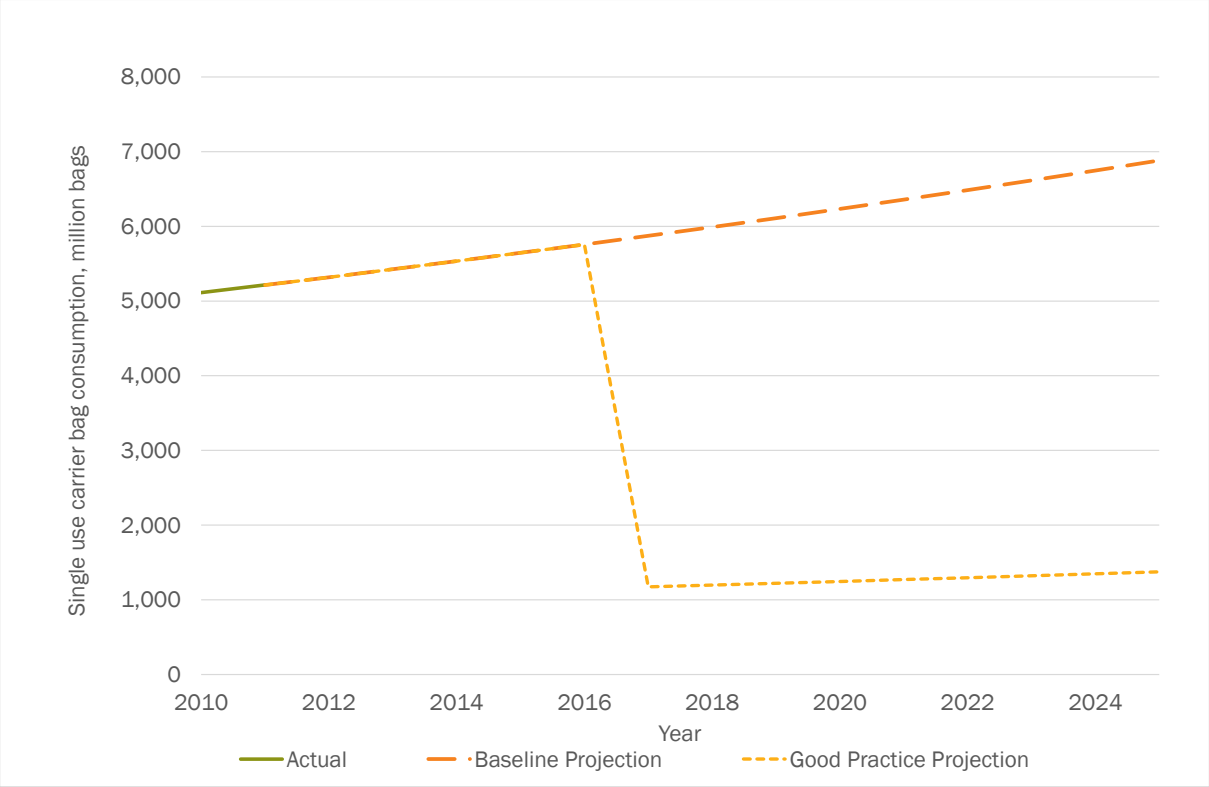


Figure 178: Change in Consumption of Single Use Carrier Bags, million bags



A.10.5 Full Revenue Outputs

Table 191: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	767	1,528	2,281	3,028	3,769	4,504	5,233	5,957	5,957	5,957
	C&I / Heating	0	0	205	404	597	597	597	597	597	597	597	597
	Electricity	0	1,992	1,992	1,992	1,992	1,992	1,992	1,992	1,992	1,992	1,992	1,992
	Sub-total Energy, million EUR	*0*	*1,992*	*2,965*	*3,924*	*4,871*	*5,618*	*6,359*	*7,094*	*7,823*	*8,547*	*8,547*	*8,547*
	Sub-total Energy, % GDP	*0.0%*	*0.1%*	*0.1%*	*0.2%*	*0.2%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.4%*	*0.3%*	*0.3%*
Transport (excl. Transport fuels)	Vehicle Taxes	0	0	4,688	9,457	14,306	19,237	25,077	25,504	25,937	26,378	26,827	27,283
	Passenger Aviation Tax	0	0	1,566	3,133	3,195	3,258	3,321	3,385	3,449	3,514	3,579	3,645
	Freight Aviation Tax	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-total Transport, million EUR	*0*	*0*	*6,254*	*12,589*	*17,501*	*22,495*	*28,398*	*28,889*	*29,386*	*29,892*	*30,406*	*30,927*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.3%*	*0.6%*	*0.8%*	*1.0%*	*1.2%*	*1.2%*	*1.2%*	*1.2%*	*1.2%*	*1.2%*

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	18	96	193	189	185	180	180	179	179	178	178
	Landfill Tax - Inerts (C&D)	0	18	35	47	42	37	32	32	32	32	32	32
	Incineration /MBT Tax	0	5	9	14	14	14	14	14	14	14	14	14
	Air Pollution Tax	0	107	196	270	331	379	346	333	321	310	299	288
	Water Abstraction Tax	0	376	728	1,058	1,367	1,654	1,602	1,586	1,570	1,556	1,541	1,527
	Waste Water Tax	0	113	218	315	304	304	304	304	304	304	304	304
	Pesticides Tax	0	0	199	374	351	339	326	315	303	292	282	271
	Aggregates Tax	0	0	847	748	650	554	460	456	452	448	443	439
	Packaging Tax	0	0	367	350	351	352	354	355	357	358	360	361
	Single Use Bag Tax	0	181	184	44	45	46	47	48	49	50	51	52
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	*0*	*816*	*2,880*	*3,414*	*3,645*	*3,865*	*3,665*	*3,622*	*3,581*	*3,542*	*3,504*	*3,467*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.1%*	*0.1%*	*0.1%*
	Total, million EUR	0	2,809	12,099	19,928	26,016	31,978	38,422	39,604	40,790	41,980	42,456	42,941
	Total, % GDP	0.0%	0.1%	0.6%	0.9%	1.2%	1.4%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%

A.11.0 Hungary: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

The information below is mainly from the European Commission's Tax-UD database[849] as well as other publically available sources. Currency conversions from HUF to € were calculated using Eurostat annual average exchange rates for the relevant year.[850]

A.11.1 Energy

- Excise duty on energy products ("Üzemanyagok jövedéki adója és energiaadó"):[851]
  - This tax is paid on the purchase of any mineral products. In Hungary, revenue figures are split into two categories: mineral oils and coal; and electricity and natural gas. Many rates have been increased in the last few years.
  - Rates: see Table 162 for details of rates. Note that a number of special rates and reductions apply, for example for gas oil used for agriculture as well as for railways and for households' usage of electricity, gas and coal.
  - Main exemptions:[852]
    - Energy products and electricity used to produce electricity; and
    - Mineral oils used by commercial airlines or for sea navigation within the EC.

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[849] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[850] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[851] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[852] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Revenue in 2011: Electricity, natural gas and coal: HUF 17.3 billion (€62 million), equivalent to 0.06% of GDP. Revenue in 2011: All other energy products: HUF 504 billion (€1.8 billion), equivalent to 1.8% of GDP.[853]
- Revenue in 2012: Electricity, natural gas and coal: HUF 16.2 billion (€57 million), equivalent to 0.06% of GDP.[854]

➢ Energy Suppliers Tax ("Robin Hood Tax"):[855] [856]

- In 2009, energy suppliers, such as coal extractors, mining companies, manufacturers and wholesalers of petroleum products, natural gas and electricity traders and electricity producers (over 50 MW) were taxed an additional 8% on pre-tax profits.
- In 2013, this rate was increased to 31% and the scope of the tax was increased to include water public service suppliers and public waste management suppliers.
- Revenue in 2012: HUF 5.6 billion (€20 million), equivalent to 0.02% of GDP. [857]

➢ Public utilities tax:[858]

- In addition to the energy suppliers tax above, a tax on public utilities, including energy companies, was imposed in 2013. This puts a tax on every metre of public utility line, including water pipes, gas lines, district heating network pipes and electricity cables.
- Rate (2013): HUF 125/m (€/m).
- Revenue: Unknown.

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[853] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[854] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[855] European Commission (2013) *Taxation Trends in the European Union*, 2013, page 95, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/index_en.htm.

[856] Hungarian Investment and Trade Agency (2013) *Business Guide Hungary 2013 - Taxation - Sector Specific Taxes*, Accessed 16 January 2014, http://www.businessguidehungary.com/#/taxation/sector-specific-taxes

[857] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[858] Hungarian Investment and Trade Agency (2013) *Business Guide Hungary 2013 - Taxation - Sector Specific Taxes*, Accessed 16 January 2014, http://www.businessguidehungary.com/#/taxation/sector-specific-taxes

- Nuclear contribution tax:
  - Rate / Description: Unknown.
  - Revenue in 2012: HUF 19 billion (€65 million), equivalent to 0.07% of GDP. [859]

Table 192: Details of Energy Excise Duties (Hungary, 2013)[860]

General Tax Base	Specific Tax Base	Tax Rate	
		HUF	EUR
Petrol (per 1000 litres)	Unleaded	123,300	416.05
	Leaded	124,200	419.08
Gas oil (per 1000 litres)	Commercial diesel (propellant)	96,555	325.80
	For agricultural horticultural, piscicultural, and forestry uses	20,439.90	68.97
	For use by railways	0	0
	All other uses	113,550	383.15
Kerosene (per 1000 litres)	All uses	124,200	419.08
Heavy fuel oil (per 1000 kg)	Sulphur content less than 1% and fulfilling other specific requirements[3]	4,425	14.93
	Sulphur content above 1% and fulfilling other specific requirements[3]	40,000	134.97
	Otherwise	116,000	391.42
Liquid Petroleum Gas (per 1000 kg)	Propellant	95,800	323.26
	Commercial & Industrial use	12,095	40.81
	Heating (business or non)	0	0
Natural Gas (per GJ)	Propellant	0	0

[859] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[860] European Commission - Taxation and Customs Union (2013) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2013, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

General Tax Base	Specific Tax Base	Tax Rate	
		HUF	EUR
	Commercial & Industrial use	88.50	0.30
	Heating (business or non-business)[1]	88.50	0.30
Coal, Coke, Lignite (per 1000 kg)	Heating (business or non-business)[1]	2,390[2]	8.06
Electricity (per MWh)	Business or non-business use[1]	295	1.00

Notes:

1. Households are exempt from paying this tax.

2. Equal to HUF 88.43 (€0.31) per GJ.

3. A viscosity above 4.5 mm^2/s at 40°C - and in respect of distillation testing, the quantity of the portion distilled up to a temperature of 250°C does not exceed 25% and the quantity of the portion distilled up to a temperature of 350°C does not exceed 80% and the density is above 860 kg/ m^3 at 15°C

A.11.2 Transport

- Registration taxes:
  - Motor vehicles tax - Motor vehicle registration duty ("Regisztrációs adó"):[861]
    - This is a one-off registration fee which is paid at the time of registration of a passenger car or motorcycle in Hungary. The rate depends on the engine size, environmental class, age of vehicle and time of registration in Hungary. A large engine size, worse environmental class and newer car results in a higher registration tax.
    - The basic rate (2013) is calculated as set out in Table 165 for passenger cars and Table 194 for motorcycles.
    - An adjustment to the rate is made based on the age of the vehicle, following a complicated formula, which results in a reduction of

[861] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

50% in tax for a vehicle approximately four years old, and a 90% reduction for vehicles more than fourteen years old.[862]

- Electric vehicles pay no registration tax and hybrid-electric vehicles pay HUF 76,000 (€256).
- Revenue in 2012: 13.7 billion HUF (€48 million), equivalent to 0.05% of GDP. [863]

[862] Regisztraciosado.hu *Regisztrációs Adó Kalkulátor 2014 (Registration Tax Calculator 2014)*, accessed 17 January 2014, http://regisztraciosado.hu/

[863] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

Table 193: Motor Vehicle Registration Duty for Vehicles with Otto Engines, by Environmental Class (Hungary, 2013)[864]

Engine Size (ccm)		Class 12+ (EURO V)		Class 9 – 11 (EURO IV)		Class 6 – 8 (EURO III)		Class 4 (EURO II)		Class 3 or lower (EURO I)	
Petrol Powered	Diesel Powered	HUF	EUR	HUF	EUR	HUF	EUR	HUF	EUR	HUF	EUR
Up to 1,100	Up to 1,300	45,000	152	180,000	607	270,000	911	360,000	1,215	540,000	1,822
1,101 – 1,400	1,301 – 1,500	65,000	219	260,000	877	390,000	1,316	520,000	1,755	780,000	2,632
1,401 – 1,600	1,501 – 1,700	85,000	287	340,000	1,147	510,000	1,721	680,000	2,295	1,020,000	3,442
1,601 – 1,800	1,701 – 2,000	135,000	456	540,000	1,822	810,000	2,733	1,080,000	3,644	1,620,000	5,466
1,801 – 1,200	2,001 – 2,500	185,000	624	740,000	2,497	1,110,000	3,745	1,480,000	4,994	2,220,000	7,491
2,001 – 2,500	2,501 – 3,000	265,000	894	1,060,000	3,577	1,590,000	5,365	2,120,000	7,154	3,180,000	10,730
Above 2,500	Above 3,000	400,000	1,350	1,600,000	5,399	2,400,000	8,098	3,200,000	10,798	4,800,000	16,197

[864] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 194: Motor Vehicle Registration Duty for Motorcycles (Hungary, 2013)[865]

Engine Size (ccm)	HUF	EUR
Up to 80	20,000	68
81 – 125	95,000	321
126 – 500	135,000	456
501 – 900	180,000	607
Above 901	230,000	776

- Circulation taxes:
  - Motor vehicles tax - Company car tax ("Cégautóadó")[866] [867]
    - All vehicles not used solely for personal use are liable to pay a monthly company car tax, collected by the central government. The tax rate is based on the engine power of the vehicle and the environmental class.
    - Rates per month are outlined in Table 195.
    - Revenue in 2012: 34.3 billion HUF (€120 million), equivalent to 0.12% of GDP. [868]

[865] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[866] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[867] Hungarian Investment and Trade Agency (2013) *Business Guide Hungary 2013 - Taxation - Other Taxes*, accessed 16 January 2014, http://www.businessguidehungary.com/#/taxation/other-taxes

[868] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

Table 195: Company Car Tax, per Month (Hungary, 2013)[869]

Engine Power (kW)	Class 0 - 4 (EURO I and II)		Class 6 – 10 (EURO III and IV)		Class 5 and 14-15 (Hybrid and EURO V+)	
	HUF	EUR	HUF	EUR	HUF	EUR
0 – 50	16,500	56	8,800	30	7,700	26
51 – 90	22,000	74	11,000	37	8,800	30
91 – 120	33,000	111	22,000	74	11,000	37
Above 120	44,000	149	33,000	111	22,000	74

- Motor vehicles Road tax ("Gépjárműadó")[870]
  - All vehicles pay an annual road tax to the relevant local authority.
  - Electric vehicles are exempt from this tax. Other vehicles, such as those used by the health service are also exempt.
  - For passenger cars, the tax rate is based on the engine power (in kW) and the age of the vehicle. A higher-rated engine and newer car pays a higher rate of tax.
  - Rates (2013):
  - In the year of manufacturing of the vehicle and the following 3 years: HUF 345/kW/year (€1.16/kW/year);
  - In the 4th to 7th year after manufacturing: HUF 300/kW/year (€1.01/kW/year);
  - In the 8th to 11th year after manufacturing: HUF 230/kW/year (€0.78/kW/year);
  - In the 12th to 15th year after manufacturing: HUF 185/kW/year (€0.62/kW/year); and
  - From the 16th year after manufacturing: HUF 140/kW/year (€0.47/kW/year).

[869] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[870] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- The tax rate for other vehicles (such as tractors and buses) is based on the weight of the vehicle. For trucks, the weight is calculated as the net weight (empty load) + 50% of the maximum pay load.
- Vehicles equipped with air or other suspension systems: HUF 1,200/100kg/year (€4.05/100kg/year) and
- Other vehicles: HUF 1,380/100kg/year (€4.66/100kg/year).
- Revenue in 2012: HUF 70.7 billion (€248 million), equivalent to 0.26% of GDP. Of these HUF 70.7 billion, HUF 24.2 billion (€85 million), equivalent to 0.09% of GDP, come from personal vehicles, whereas HUF 46.5 billion (€163 million), equivalent to 0.17% of GDP, come from company cars. [871]

➢ Other:

- Insurance Tax[872]
  - This tax was introduced in 2013 and is paid by insurance companies, based on insurance premiums received, for example on vehicles.
  - Rates: for insurance companies with a tax base of less than HUF 8 billion (€27 million): 3.75% up to HUF 1 billion (€3.4 million); 7.5% thereafter. For companies with a tax base of more than HUF 8 billion (€27 million): 15%.
  - Revenue in 2012: Unknown.
- Accident Tax[873]
  - A tax is also paid directly by customers who take out mandatory third party liability insurance for vehicles. This was introduced in 2012.
  - The rate is 30% of the insurance premium up to a maximum of HUF 83 (€0.29) per vehicle per day (2013).

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[871] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[872] Hungarian Investment and Trade Agency (2013) *Business Guide Hungary 2013 - Taxation - Sector Specific Taxes*, accessed 16 January 2014, http://www.businessguidehungary.com/#/taxation/sector-specific-taxes

[873] RSM DTM Hungary, and Hungarian Investment and Trade Agency (2013) *Doing Business in Hungary 2013*, March 2013, http://www.doingbusinessinhungary.com/documents/Doing%20Busienss%20in%20Hungary%202013%20-%20RSM%20DTM%20Hungary%20Plc._Szucs%20and%20partners.pdf

- Revenue in 2012: HUF 25.9 billion (€87 million), equivalent to 0.09% of GDP.[874]

- Road toll:
  - Hungary has a toll system in place for most expressways and main roads. From 1 July 2013, the single system which used to cover all vehicles was split into two systems, with the E-Vignettes covering vehicles of class D1 (motorcycles and other vehicles of less than 3.5 tonnes) and B2 (buses with a maximum permissible weight of greater than 3.5 tonnes) and the new HU-GO system covering vehicles of class J2, J3 and J4 (heavy goods vehicles with a maximum permissible weight of more than 3.5 tonnes), formerly categories D2, D3 and D4. E-Vignettes are charged at a flat rate, with tickets available with 10-day, 1-month or 1-year validity periods. The new HU-GO system has been introduced to comply with European Union requirements on electronic toll service. This means that the HU-GO system is distance-based rather than flat rate.[875]
  - Rates: see Table 196 for details of the E-Vignette rates and Table 197 for details of the HU-GO rates.
  - Revenue in 2012 (for all vehicle categories): HUF 53 billion (€186 million), equivalent to 0.19% of GDP.[876]

Table 196: E-Vignette Road Toll Prices (Hungary, 2014)[877]

Vehicle Category	Weekly (10 Days)		Monthly		Annual	
	HUF	EUR	HUF	EUR	HUF	EUR
D1 (motorcycle)	1,470	4.94	4,780	16.06	42,980	144.38
D1 (vehicle < 3.5 tonnes)	2,975	9.99	4,780	16.06	42,980	144.38

[874] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[875] HU-GO Electronic Toll System (2013) *About the Introduction of the System*, Accessed 19 January 2014, https://hu-go.hu/articles/view/206572#menu

[876] Hungarian Transport Administration (2013) *Revenue from Purchased Vignettes - Monthly Split (Gross)*, December 2013, page 14, http://www.3k.gov.hu/remos_downloads/purch_rev_monthly_13.12.31_fcs.195.pdf

[877] National Toll Payment Services (2014) *E-Vignette & Payment: Pricing 2013*, Accessed 19 January 2014, http://toll-charge.hu/Toll-tariffs/Pricing-2013/

B2 (bus > 3.5 tonnes)	13,385	44.96	21,975	73.82	199,975	671.78

Table 197: HU-GO Road Toll Prices for HGVs (HUF/km) (Hungary, 2014)[878]

Road Category	Environmental Class	Vehicle Category (HGV, max. Permissible Weight > 3.5 t)					
		J2 (2 axles)		J3 (3 axles)		J4 (4+ axles)	
		HUF	EUR	HUF	EUR	HUF	EUR
Expressway	A (EURO III+)	42.42	0.14	59.52	0.20	86.70	0.29
	B (EURO II)	49.90	0.17	70.02	0.24	108.38	0.36
	C (EURO I)	57.39	0.19	80.52	0.27	130.06	0.44
Main route	A (EURO III+)	18.05	0.06	31.24	0.10	54.08	0.18
	B (EURO II)	21.23	0.07	36.75	0.12	67.60	0.23
	C (EURO I)	24.41	0.08	42.26	0.14	81.12	0.27

A.11.3 Pollution and Resources

- Landfill tax:
  - A landfill tax was introduced in 2013, using a phased approach with an annual increase in the rate.[879]
  - Residual waste, construction and demolition waste, hazardous waste and residual sewage sludge are all charged at the same rate, whereas recoverable hazardous and non-hazardous waste post-recovery is charged 50% less than the other waste types.[880]
  - Rates (2013):

[878] HU-GO Electronic Toll System (2013) *About the Amount of the Toll*, Accessed 19 January 2014, https://hu-go.hu/articles/view/206574#menu

[879] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Hungary*, Report for European Commission - DG Environment, July 2013, page 16.

[880] See Table 4.29 in Ministry of National Development (2014) *6th National Communiation of Hungary to the UNFCCC*, January 2014, page 113, http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6-final_hun%5B1%5D.pdf.

    - Residual, construction and demolition, hazardous and residual sewage sludge: HUF 3,000/tonne (€10.12/tonne)
    - Recoverable hazardous and non-hazardous waste post-recovery: HUF 1,500/tonne (€5.06/tonne).
  - Rates (2014):
    - Residual, construction and demolition, hazardous and residual sewage sludge: HUF 6,000/tonne (€20.16/tonne)
    - Recoverable hazardous and non-hazardous waste post-recovery: HUF 3,000/tonne (€10.08/tonne).
  - Rates (2015):
    - Residual, construction and demolition, hazardous and residual sewage sludge: HUF 9,000/tonne (€30.23/tonne)
    - Recoverable hazardous and non-hazardous waste post-recovery: HUF 4,500/tonne (€15.12/tonne).
  - Rates (2016):
    - Residual, construction and demolition, hazardous and residual sewage sludge: HUF 12,000/tonne (€40.31/tonne)
    - Recoverable hazardous and non-hazardous waste post-recovery: HUF 6,000/tonne (€20.16/tonne).
  - Revenue: Unknown (data from 2013 is not yet available).
- Environmental Product Charge:
  - This charge is paid by all importers or producers of products which carry an environmental impact, including packaging materials.
  - The Green Tax Act, which came into force on 1st January 2012, changed the way packaging and other materials were charged and separated packaging by whether it is materials or tools (assembled product containers for retail).[881] The law relating to this tax has recently been amended, but this has not resulted in any changes the product categories outlined below.[882]

[881] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Hungary*, Report for European Commission - DG Environment, July 2013, page 20.

[882] See, for example: RSM DTM Hungary (2014) *Environmental Product Charge Changes*, Published 1st January, Accessed 28th January 2014, www.rsmdtm.hu/environmental-product-charge-changes

- Rates (2013)[883] and revenues (2010)[884] from individual product categories are presented below.
- Batteries:
  - Batteries filled with electrolyte: HUF 60/kg (€0.20/kg)
  - Batteries not filled with electrolyte: HUF 80/kg (€0.27/kg)
  - Revenue in 2010: HUF 208 million (€750,000), equivalent to 0.001% of GDP.
- Printing paper (such as for advertising):
  - HUF 64/kg (€0.22/kg)
  - Revenue in 2010: HUF 2.1 billion (€7.6 million), equivalent to 0.01% of GDP.
- Electric / Electronic products:
  - HUF 50 – 500 per kg (€0.17 - €1.69 per kg)
  - Revenue in 2010: HUF 4.6 billion (€16.7 million), equivalent to 0.02% of GDP.
- Lubricating oils:
  - HUF 112/kg (€0.38/kg)
  - Revenue in 2010: HUF 4.0 billion (€15 million), equivalent to 0.02% of GDP.
- Tyres:
  - HUF 52/kg (€0.18/kg)
  - Revenue in 2010: HUF -115 million (€-0.4 million), equivalent to -0.0004% of GDP.
- Packaging materials:
  - Plastic: HUF 42/kg (€0.14/kg);
  - Composite: HUF 50/kg (€0.17/kg);
  - Layered beverage cartons: HUF 28/kg (€0.09/kg);
  - Metal: HUF 20/kg (€0.07/kg);

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[883] RSM DTM Hungary, and Hungarian Investment and Trade Agency (2013) *Doing Business in Hungary 2013*, March 2013, http://www.doingbusinessinhungary.com/documents/Doing%20Busienss%20in%20Hungary%202013%20-%20RSM%20DTM%20Hungary%20Plc._Szucs%20and%20partners.pdf, pages 53 – 54.

[884] OECD/EEA (2013) *Database on Instruments used for Environmental Policy and Natural Resources Management*, accessed 29 December 2013, http://www2.oecd.org/ecoinst/queries/index.htm

    - Paper, wood, textile of natural origin: HUF 20/kg (€0.07/kg);
    - Glass: HUF 17/kg (€0.06/kg); and
    - Other: HUF 50/kg (€0.17/kg)
    - Revenue: Unknown
  - Commercial (retail) packaging materials (i.e assembled packaging products):
    - Plastic (other than shopping bags): HUF 60/kg (€0.20/kg);
    - Plastic shopping bags: HUF 1,800/kg (€6.07/kg);
    - Glass: HUF 17/kg (€0.06/kg);
    - Composite: HUF 300/kg (€1.01/kg);
    - Layered beverage cartons: HUF 130/kg (€0.44/kg);
    - Metal: HUF 300/kg (€1.01/kg); and
    - Other: HUF 300/kg (€1.01/kg)
    - Revenue: Unknown
  - Revenue from all environmental product charges (2012): [885]
    - From imported products: HUF 35 million (€120,000), equivalent to 0.0001% of GDP.
    - From domestic products: HUF 55.0 billion (€190 million), equivalent to 0.020% of GDP.
- Pollution charges ("load charges"):
  - Hungary has charges in place for emissions of pollutants to air:
    - Rates (2013):[886]
      - Nitrogen oxides: HUF 120/kg (€0.40/kg);
      - Non-toxic dust: HUF 30/kg (€0.11/kg); and
      - Sulphur dioxide: HUF 50/kg (€0.18/kg)

[885] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[886] Hungarian Central Statistical Office (2011) *Environmental Taxes in Hungary: Final Report*, June 2011, page 9, https://circabc.europa.eu/sd/d/5359fa6f-53ad-45e2-abd4-00c719bab2fa/09%20HU%20254%20Env%20tax.pdf.

    - Revenue (2010): HUF 6.6 billion (€24 million), equivalent to 0.025% of GDP.[887]
- Emissions to water are also charged per kg for utilities emitting pollutants into water:
    - Rates (2013):[888] [889]
        - Chemical Oxygen Demand: HUF 90/kg (€0.30/kg);
        - Phosphorus: HUF 1,500/kg (€5.06/kg);
        - Nitrogen: HUF 180/kg (€0.61/kg);
        - Mercury: HUF 220,000/kg (€740/kg);
        - Cadmium: HUF 44,000/kg (€150/kg);
        - Chromium / Nickel / Lead: HUF 8,800/kg (€30/kg); and
        - Copper: HUF 4,400/kg (€15/kg)
    - Revenue (2008): HUF 6.3 billion (€25 million), equivalent to 0.024% of GDP.[890]
- Emission to soils of domestic sewage and other waste water:[891]
    - Rate (2013): HUF 1,200/m^3 (€4.05/m^3).
    - Revenue (2008): HUF 18 million (€720,000), equivalent to 0.0001% of GDP.[892]

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[887] OECD/EEA (2013) *Database on Instruments used for Environmental Policy and Natural Resources Management*, accessed 29 December 2013, http://www2.oecd.org/ecoinst/queries/index.htm

[888] Hungarian Central Statistical Office (2011) *Environmental Taxes in Hungary: Final Report*, June 2011, page 9, https://circabc.europa.eu/sd/d/5359fa6f-53ad-45e2-abd4-00c719bab2fa/09%20HU%20254%20Env%20tax.pdf.

[889] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Hungary*, Report for European Commission - DG Environment, July 2013, page 16.

[890] OECD/EEA (2013) *Database on Instruments used for Environmental Policy and Natural Resources Management*, accessed 29 December 2013, http://www2.oecd.org/ecoinst/queries/index.htm

[891] Hungarian Central Statistical Office (2011) *Environmental Taxes in Hungary: Final Report*, June 2011, https://circabc.europa.eu/sd/d/5359fa6f-53ad-45e2-abd4-00c719bab2fa/09%20HU%20254%20Env%20tax.pdf, page 9.

[892] OECD/EEA (2013) *Database on Instruments used for Environmental Policy and Natural Resources Management*, accessed 29 December 2013, http://www2.oecd.org/ecoinst/queries/index.htm

- Revenue figures from all emissions related charges totalled approximately HUF 8.3 billion in 2012 (€), equivalent to % of GDP. [893]

- Water abstraction charge:[894]
  - Rate: HUF 4.50 (€0.02) per m^3 for users of water.
  - Rate: HUF 14.10 (€0.05) per m^3 for industrial consumers.
- Other / Unknown:[895]
  - Forestry Fund Tax:
    - Rate / tax base / description: unknown.
    - Revenue: 2010: HUF 50 million (€180,000), equivalent to 0.0002% of GDP. Revenues have been decreasing significantly over recent years and recent information suggests this tax may no longer exist.
  - Soil Protection Levy:
    - Rate / tax base / description: Unknown.
    - Revenue: 2010: HUF 2.5 million (€9,100), equivalent to 0.00001% of GDP.
  - Noise abatement levy:
    - Rate: complex formula – see cited reference for details.
    - Revenue: 2010: HUF 19 million (€69,000), equivalent to 0.00007% of GDP.
  - Water fund tax:
    - Rate / tax base / description: Unknown.
    - Revenue: 2010: HUF 14.4 billion (€52 million), equivalent to 0.054% of GDP.
  - Under Hungary's Mining Act royalties are charged on the extraction of minerals, gas and oil. The rate of the royalty varies depending on the type of mineral being extracted and the method of extraction. For example, a 12% royalty is charged on the value derived from the

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[893] See Table 2.5.1 in Központi Statisztikai Hivatal (Hungarian Central Statistical Office) (2013) *Magyarország Nemzeti Számlái / National Accounts Hungary 2010 - 2012*, November 2013, pp. 64 - 69, http://www.ksh.hu/docs/hun/xftp/idoszaki/monsz/monsz1012.pdf.

[894] Hungarian Central Statistical Office (2011) *Environmental Taxes in Hungary: Final Report*, June 2011,page 10, https://circabc.europa.eu/sd/d/5359fa6f-53ad-45e2-abd4-00c719bab2fa/09%20HU%20254%20Env%20tax.pdf.

[895] OECD/EEA (2013) *Database on Instruments used for Environmental Policy and Natural Resources Management*, accessed 29 December 2013, http://www2.oecd.org/ecoinst/queries/index.htm

extraction of mineral oil and natural gas. The rate for non-metallic minerals extracted via open cast excavations (this includes sands and gravels) is set at 5% of the total value derived from these products. Further details can be obtained in the cited reference.[896]

A.11.4 Water Charges

- Tariffs between residential and institutional customers vary (higher for institutional customers):[897]
  - For drinking water: up to almost 200 HUF (€0.69)
  - For waste water: more than 100 HUF (€0.34)
- Water tariff in 2013 (according to Water Works of Budapest):
  - 243.71 HUF (€0.90) / m^3 for residential customers.
  - 252.60 HUF (€0.93) / m^3 for non-residential.
  - Monthly base fee for consumption above 0 m^3 is 200.66 HUF (€0.74).
  - Meter usage fee is 315 HUF (€1.16) / calendar day / meter.

A.11.5 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 12.2.2, we list here a complete list of subsidies identified in Hungary by the IEEP and by IVM for which financial information is not available:

Table 198: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
Tax reduction for commercial diesel	TAXUD	HUF 96,555 per 1000l (€326) - from HUF 113,550 per 1000l (€383)

DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 173.

[896] Mining Bureau of Hungary (1998) Act XLVIII of 1993 on Mining Consolidated with Government Decree No. 203/1998. (XII. 19.) Issued for its Execution, www.mbh.hu/english.htm

[897] Institute for European Environmental Policy, and Ecologic (2013) *Member States' Achievements in Selected Environmental Policy Areas: Hungary*, Report for European Commission - DG Environment, July 2013, pages 10 – 11.

Table 199: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (RON million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for gas oil used in agriculture, horticulture, pisciculture and forestry	TAXUD	Gas Oil - Other Sectors - Agricultural/Forestry	250	1000t	301,205	1000l	383.00	69	26,422
Excise tax exemption for gas oil used for rail transport	TAXUD	Gas Oil - Transport - Railways	46	1000t	55,422	1000l	383.00	0	5,930
Excise tax exemption for household usage of electricity	TAXUD	Electrical Generation - Other Sectors - Households	11,312	GWh	11,312,000	MWh	1.03	0	3,255

Sources: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, *http://ec.europa.eu/taxation_customs/index_en.htm#*

A.11.6 Change in Tax Bases

Table 200: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	2,415	2,385	-30
Petrol	million litres	1,181	1,181	0
Kerosene	million litres	215	215	0
LPG	thousand tonnes	21	19	-2
Heavy Fuel Oil	thousand tonnes	5	5	0
Natural Gas	TJ (GCV)	203,426	160,746	-42,681
Coal	thousand tonnes	756	714	-42
Electricity	GWh	25,951	25,951	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[898] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[898] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 179: Change in Intra-EU Passenger Flights, flights per year

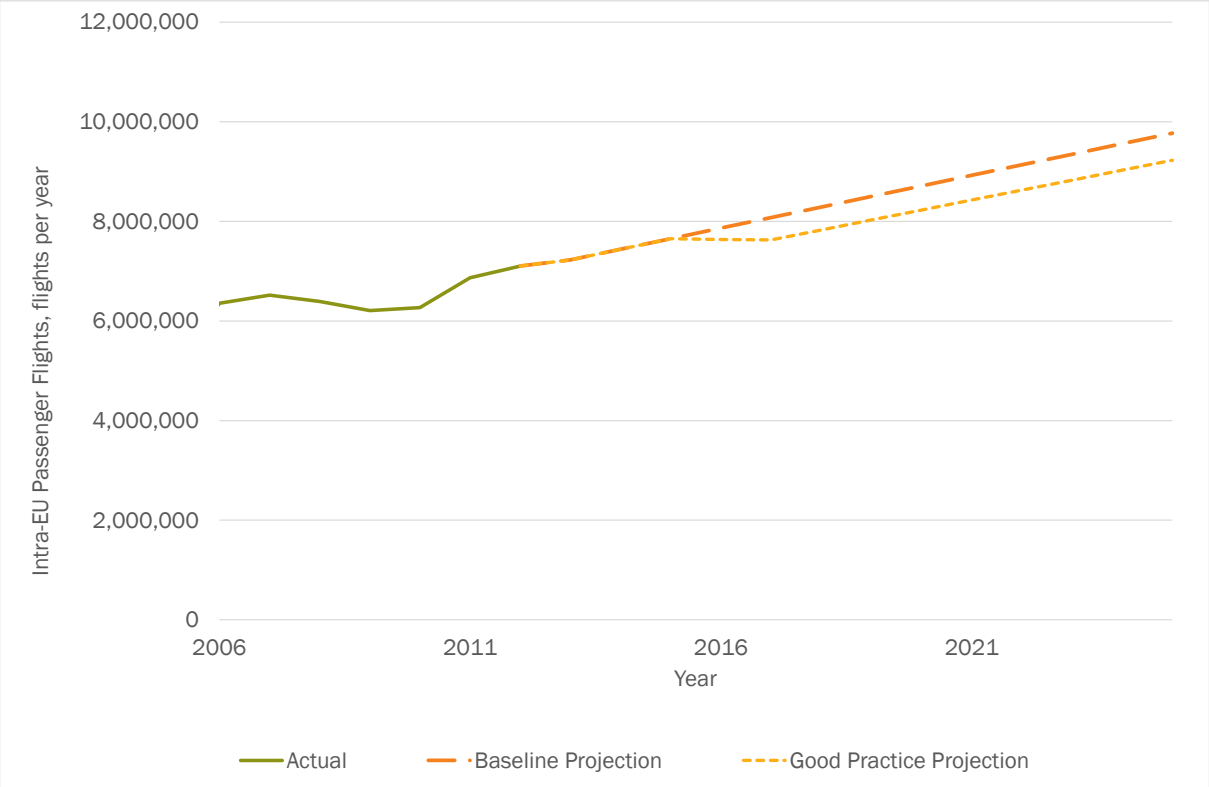


Figure 180: Change in Extra-EU Passenger Flights, flights per year

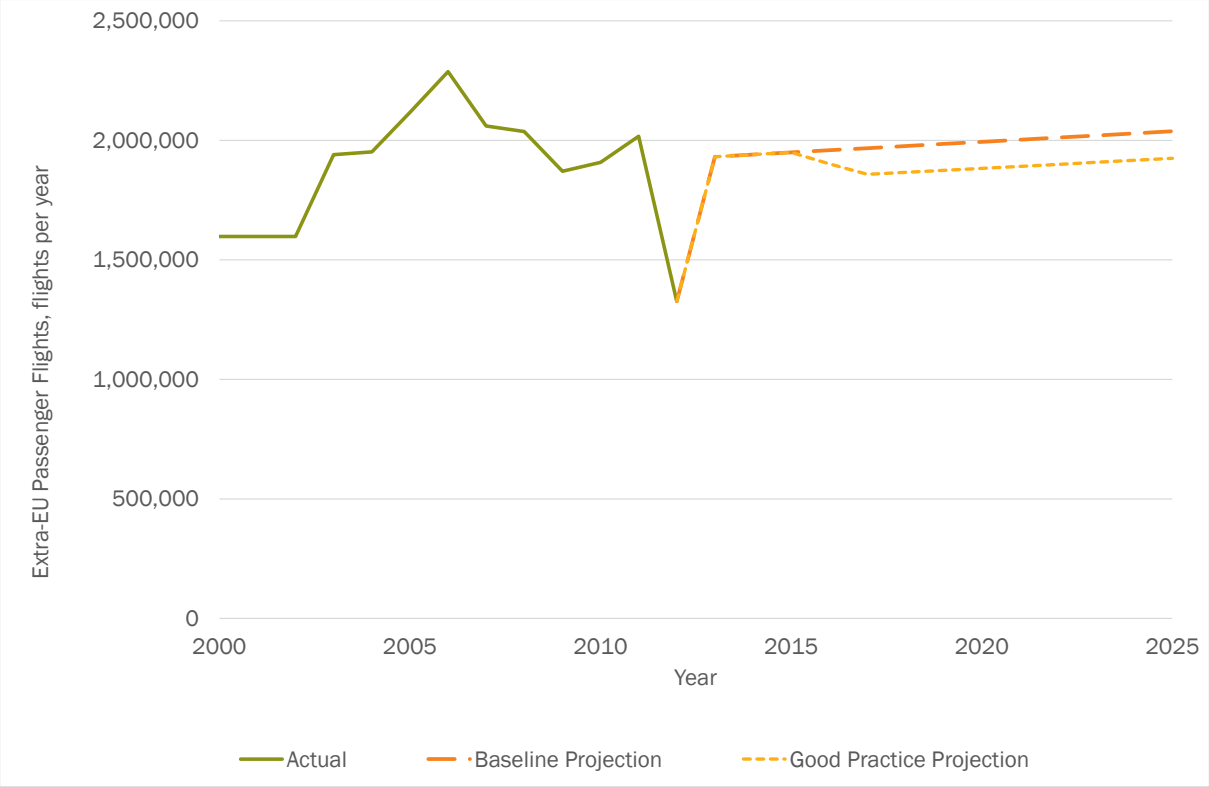


Figure 181: Change in Intra-EU Air-freight, tonnes

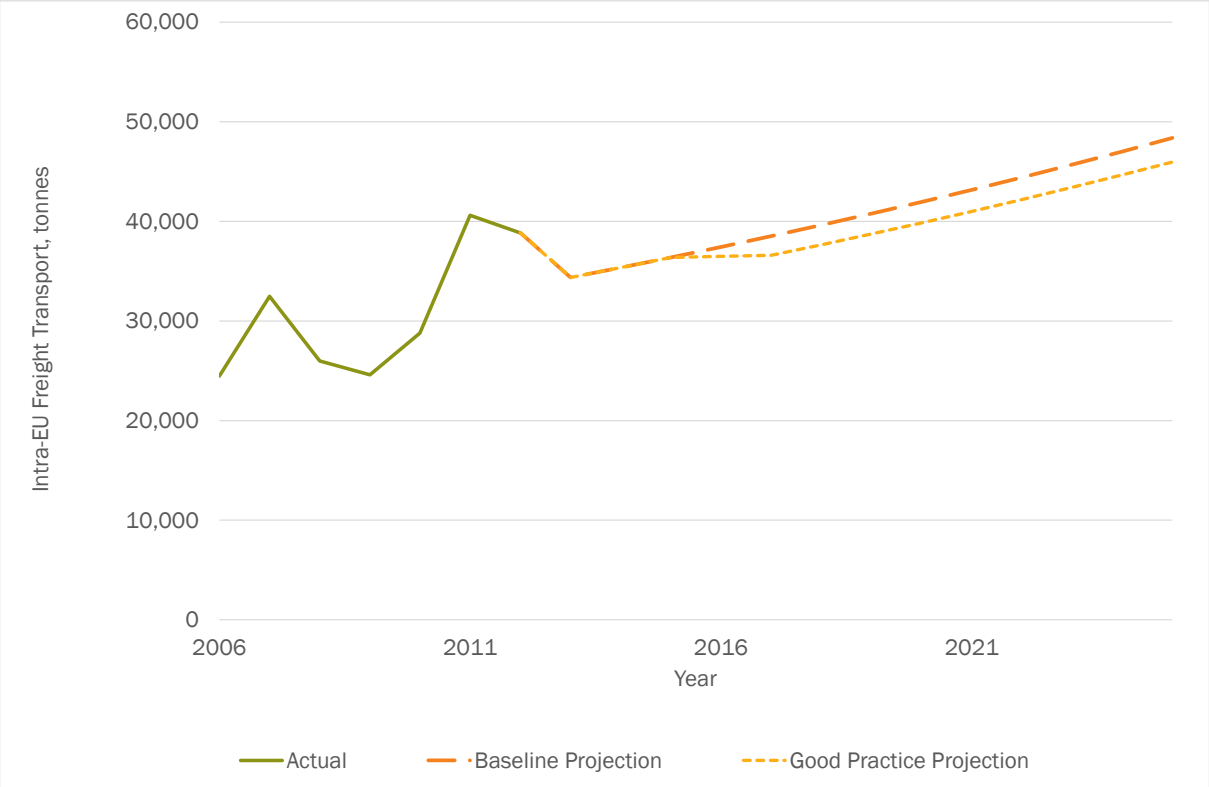


Figure 182: Change in Extra-EU Air-freight, tonnes

Figure 183: Change in Non-Hazardous Waste Landfilled, thousand tonnes

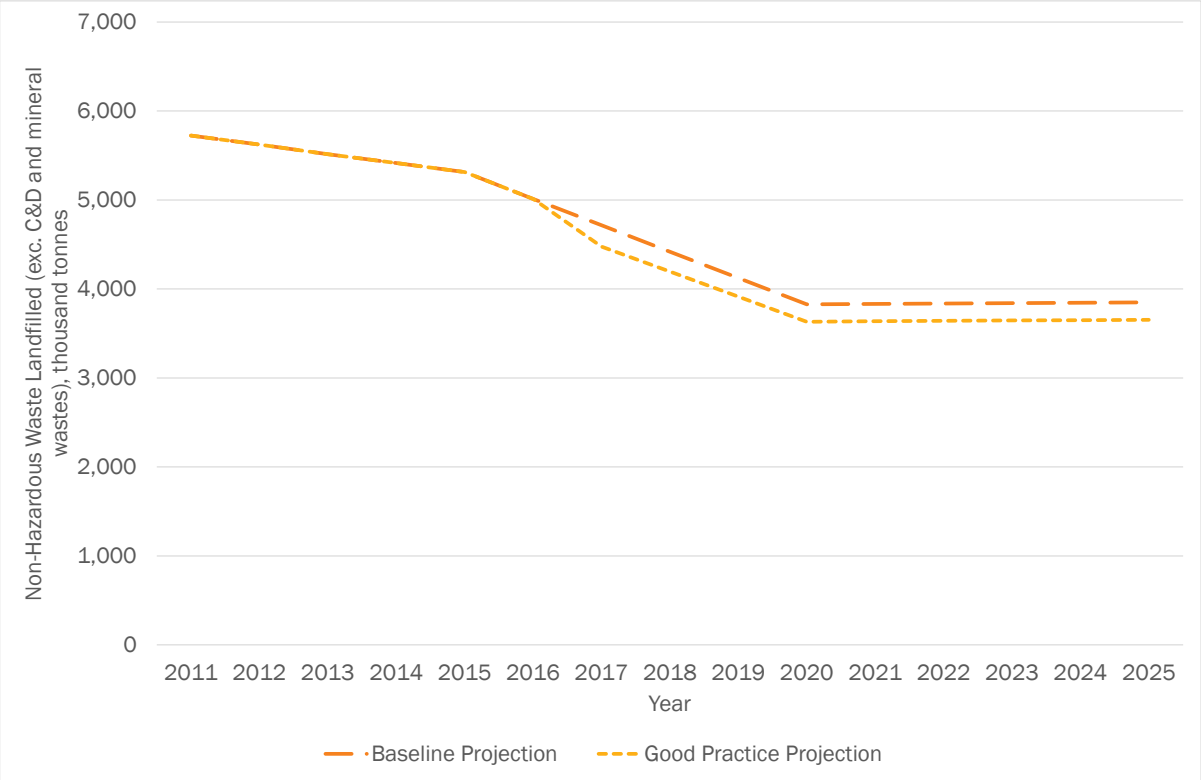


Figure 184: Change in MBT/ Incineration, thousand tonnes

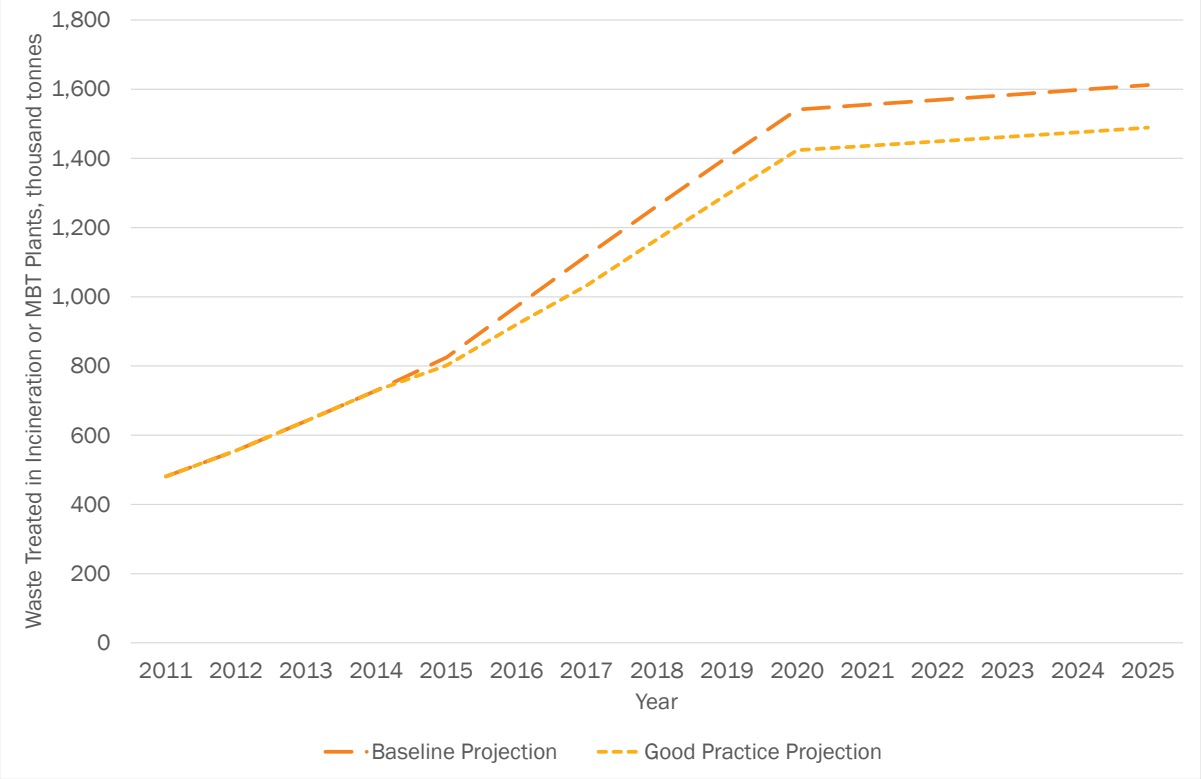


Figure 185: Change in SOx Emissions, tonnes

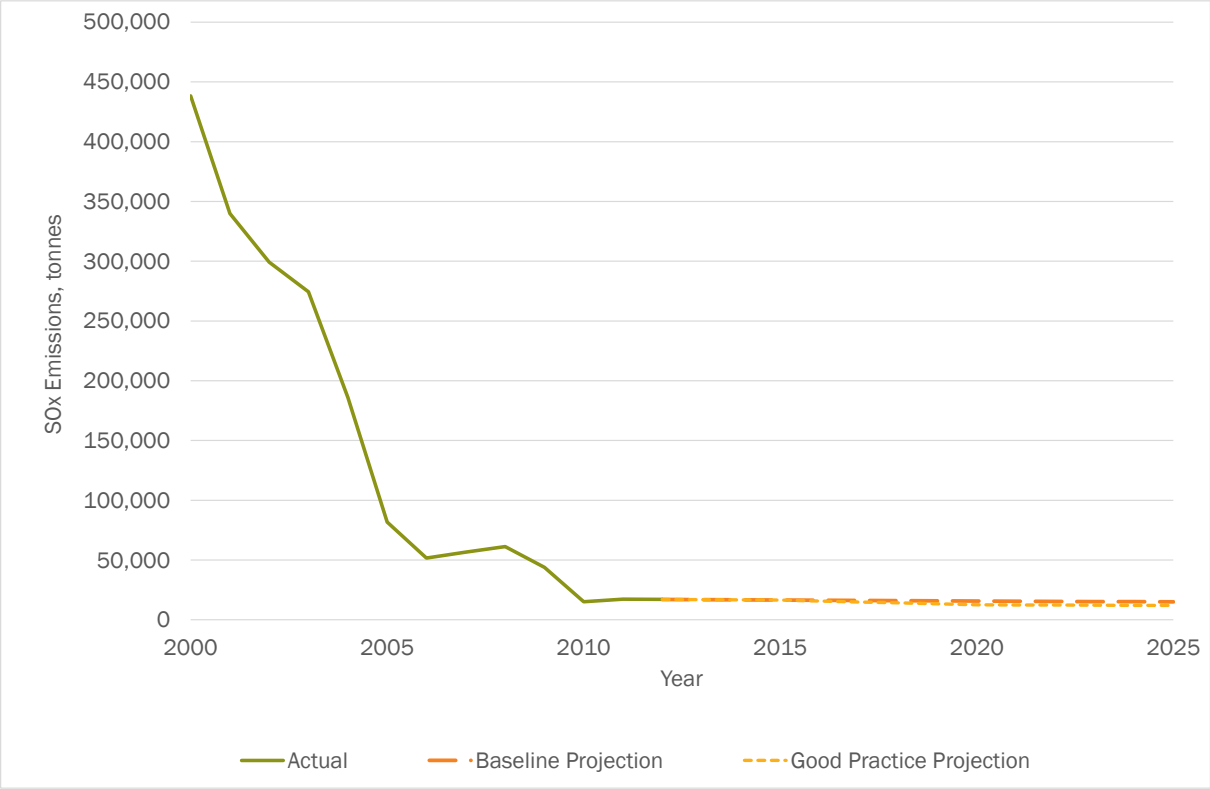


Figure 186: Change in NOx Emissions, tonnes

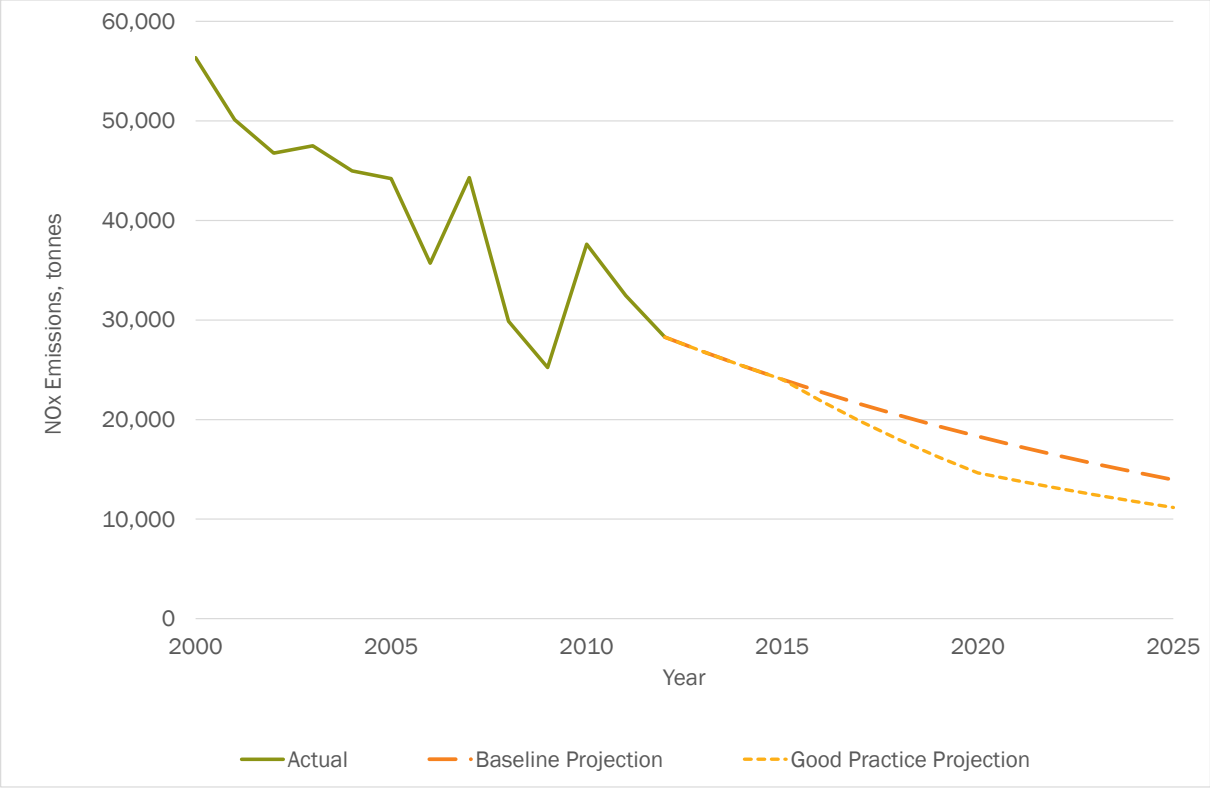


Figure 187: Change in PM_{10} Emissions, tonnes

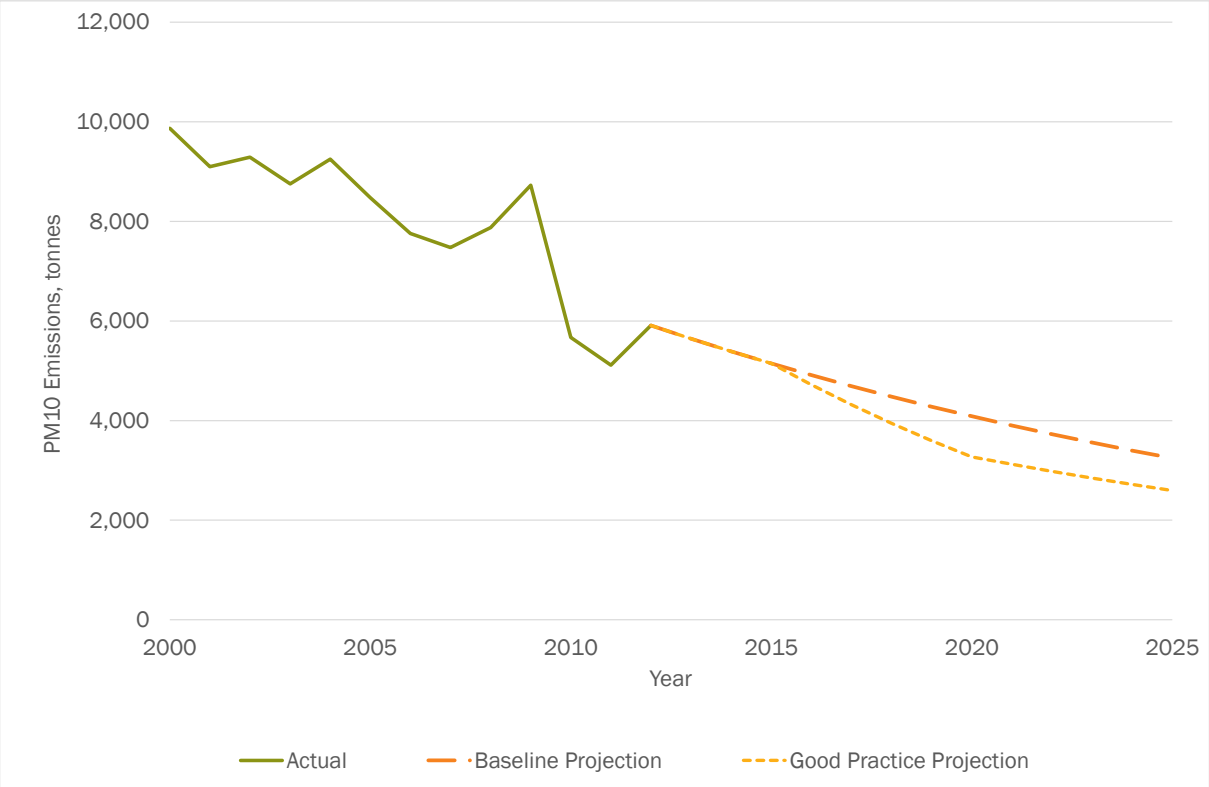


Figure 188: Change in Groundwater Abstraction – Public Supply, million cubic metres

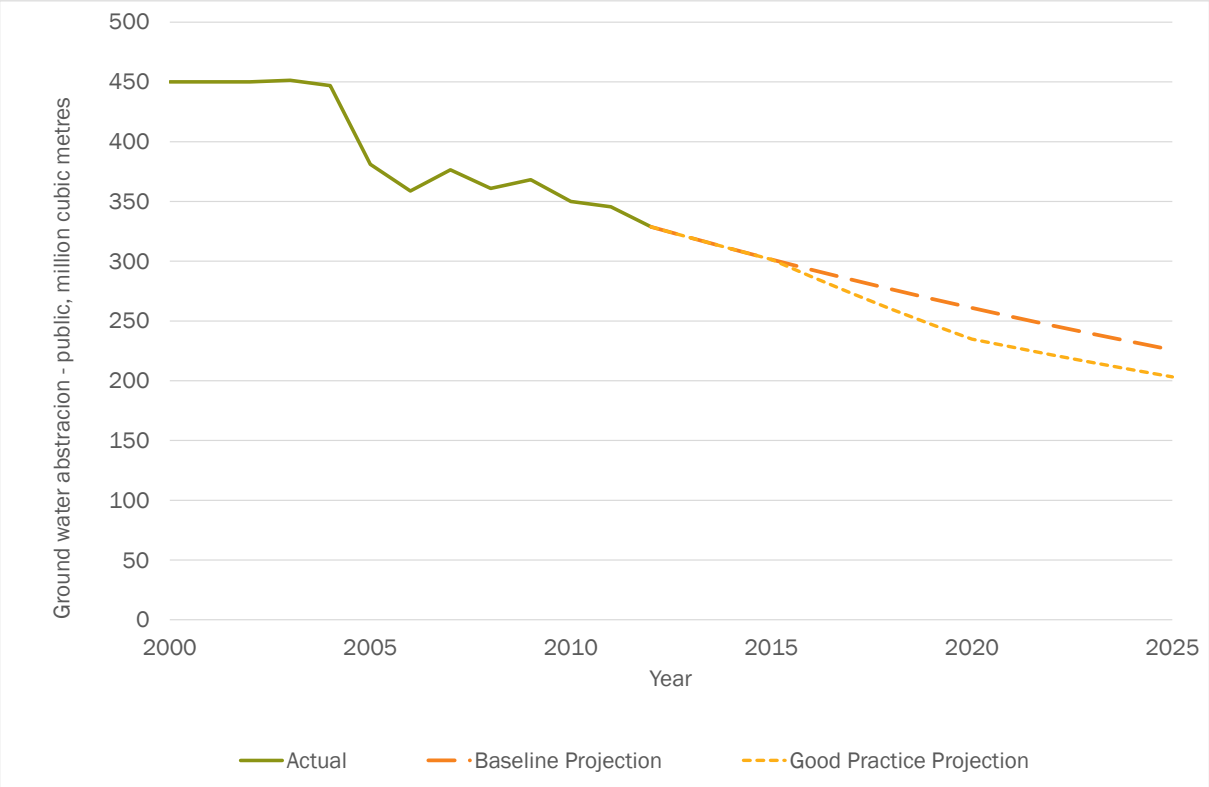


Figure 189: Change in Groundwater Abstraction – Manufacturing, million cubic metres

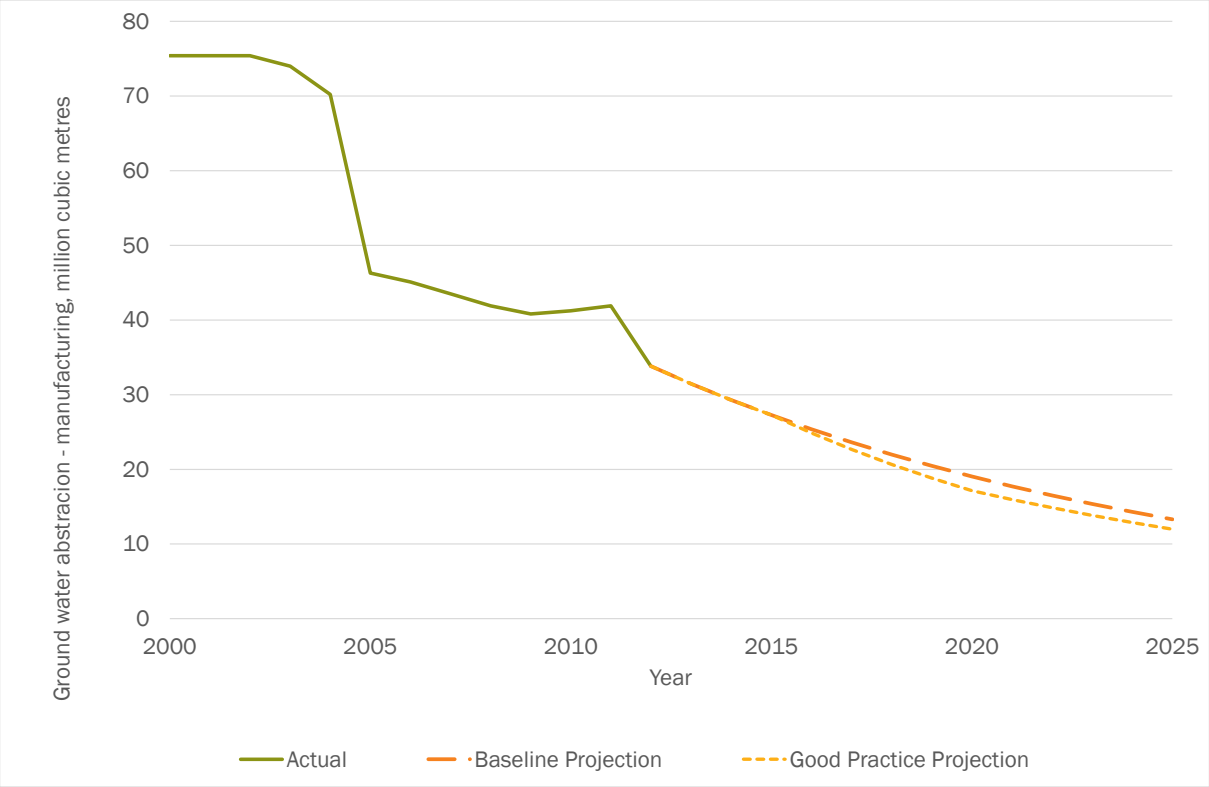


Figure 190: Change in Groundwater Abstraction – Agriculture, million cubic metres

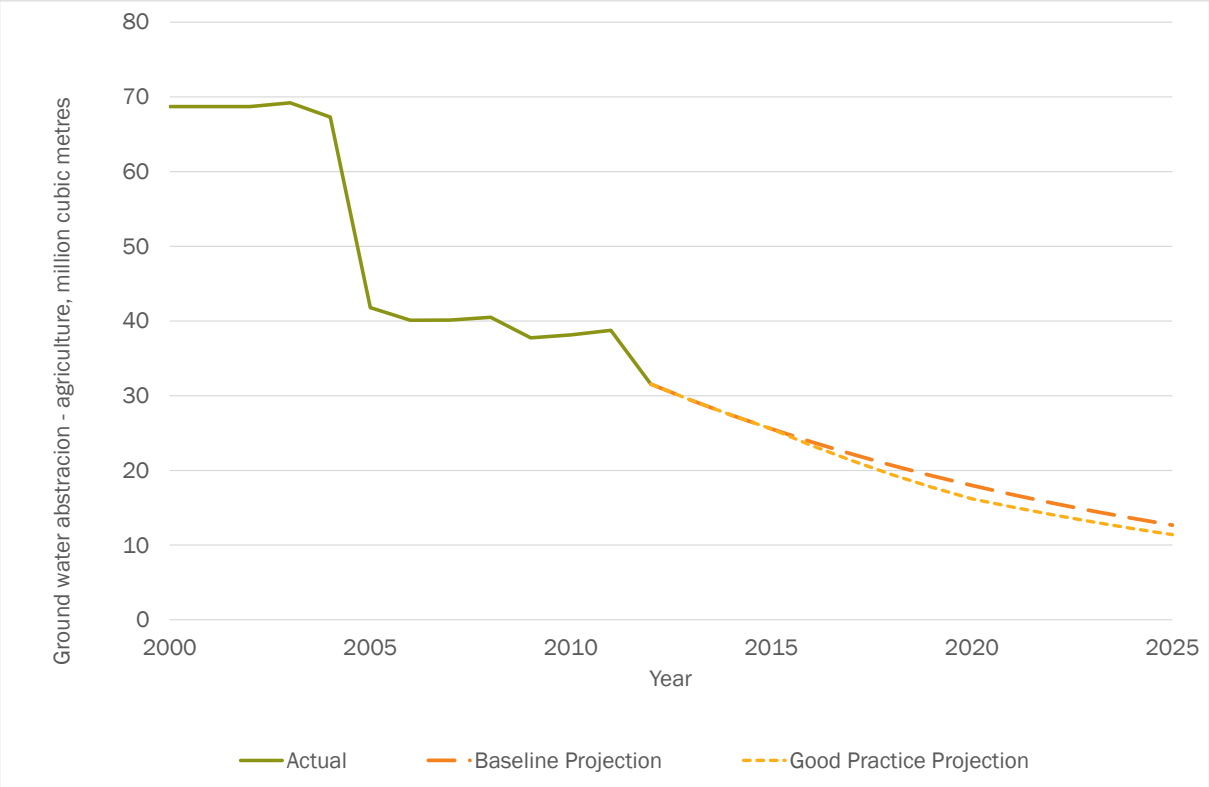


Figure 191: Change in Surface Water Abstraction – Public Supply, million cubic metres

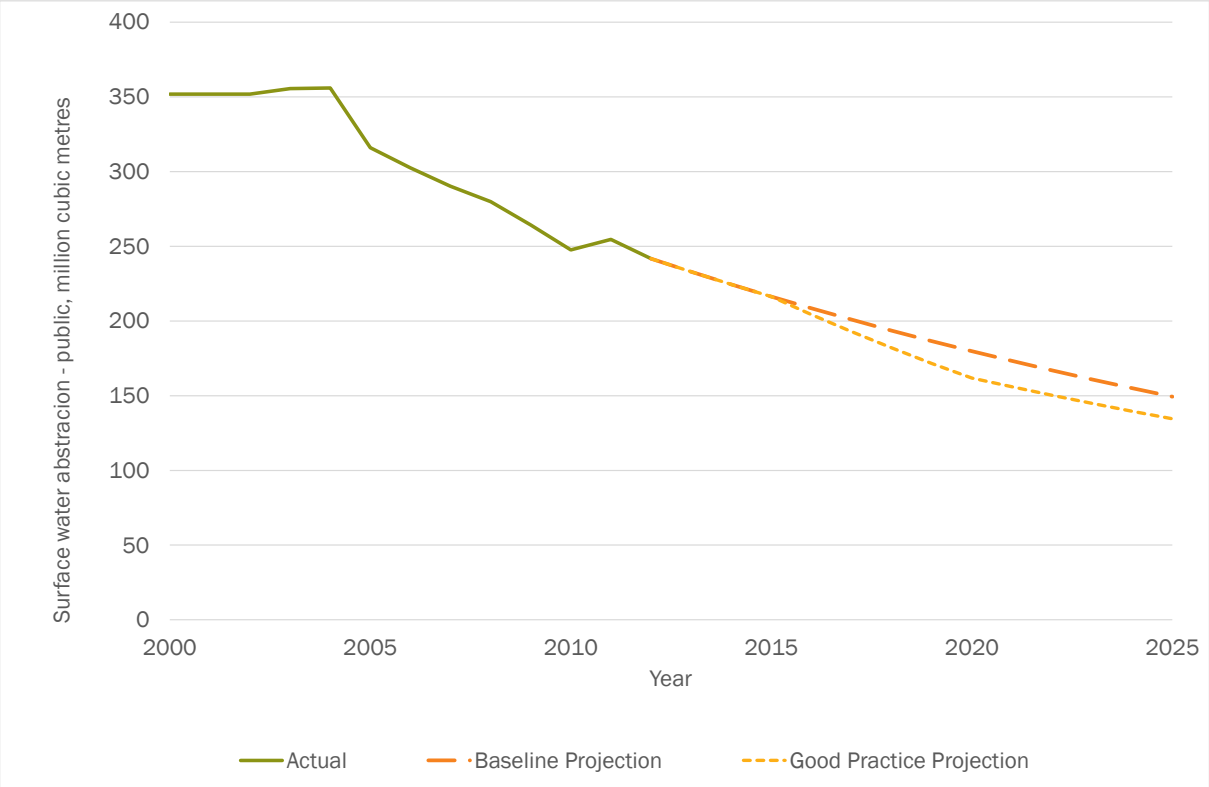


Figure 192: Change in Surface Water Abstraction – Manufacturing, million cubic metres

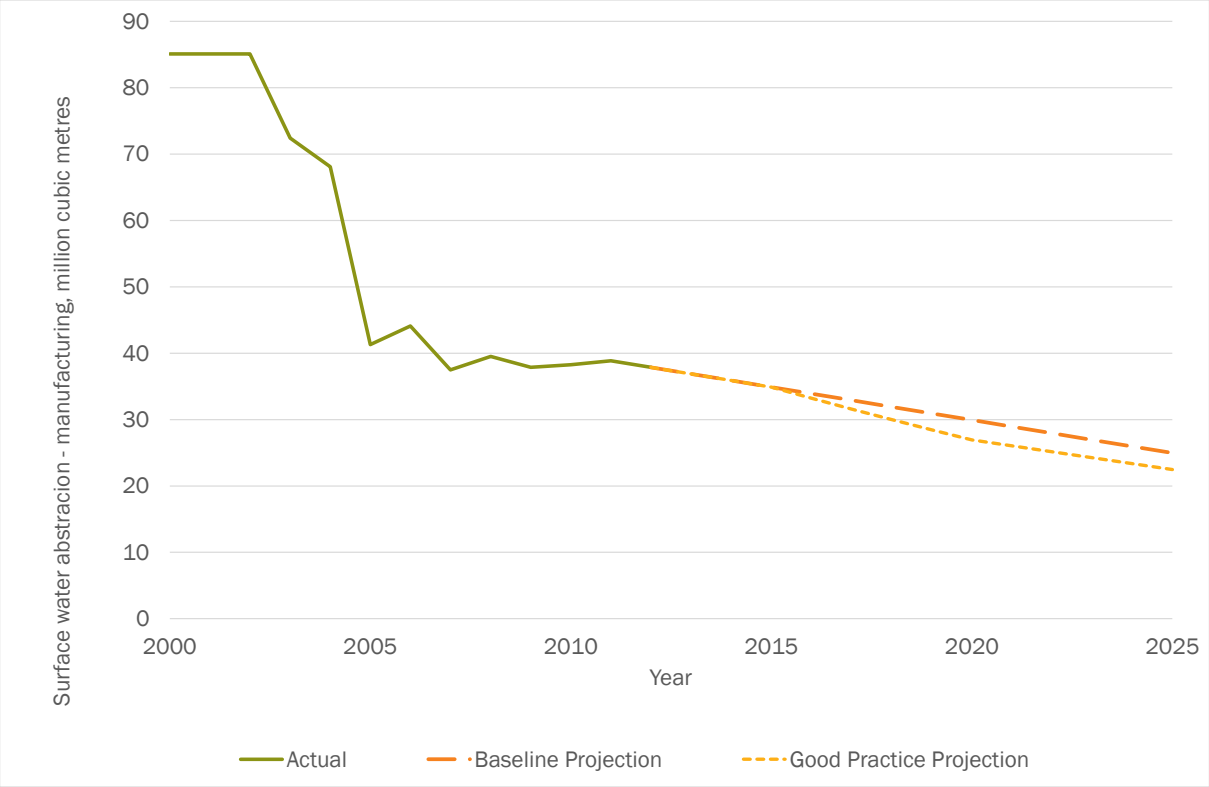


Figure 193: Change in Surface Water Abstraction – Agriculture, million cubic metres

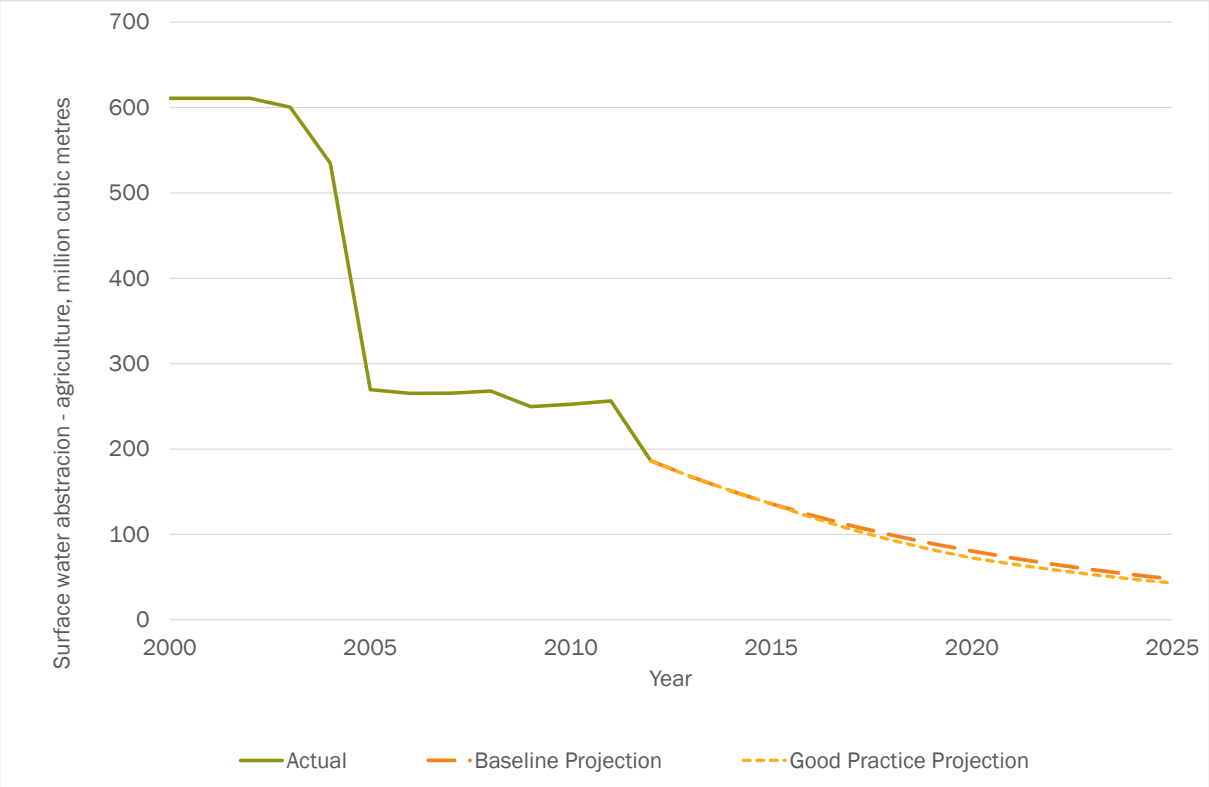


Figure 194: Change in Active Ingredients in Pesticides, tonnes

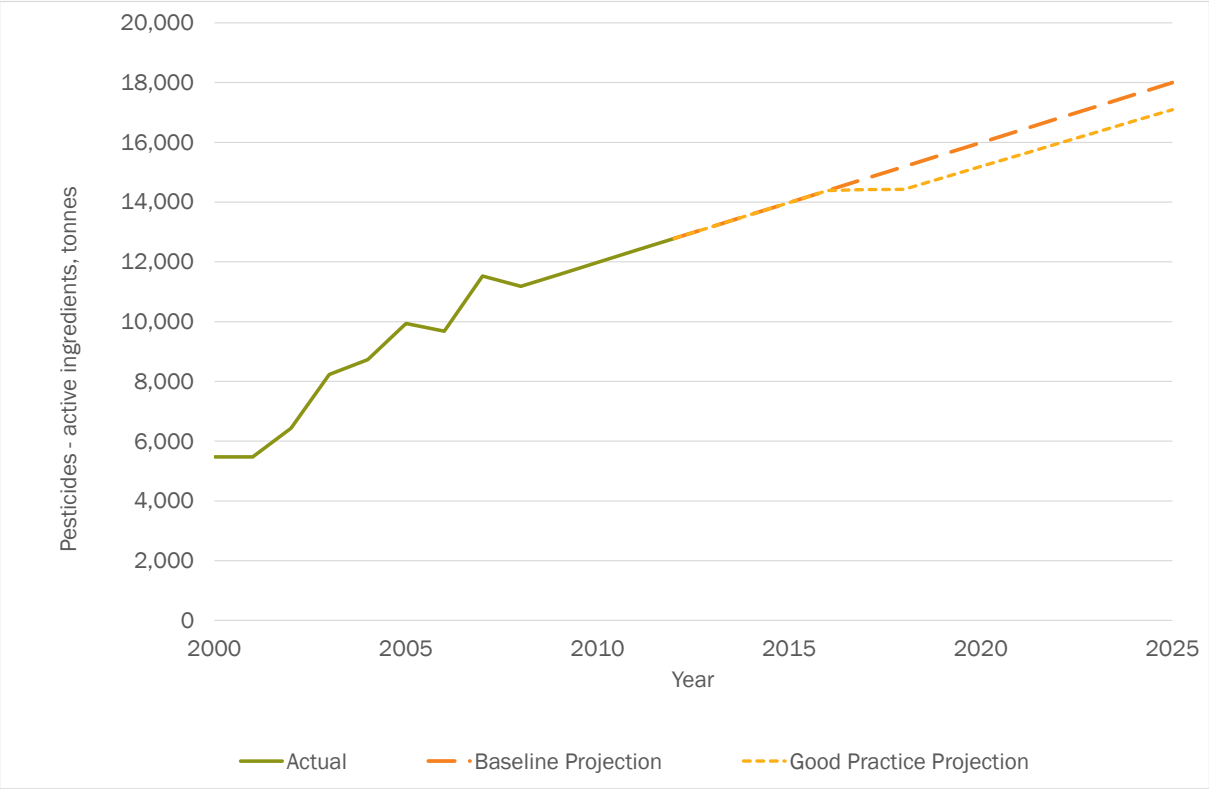


Figure 195: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

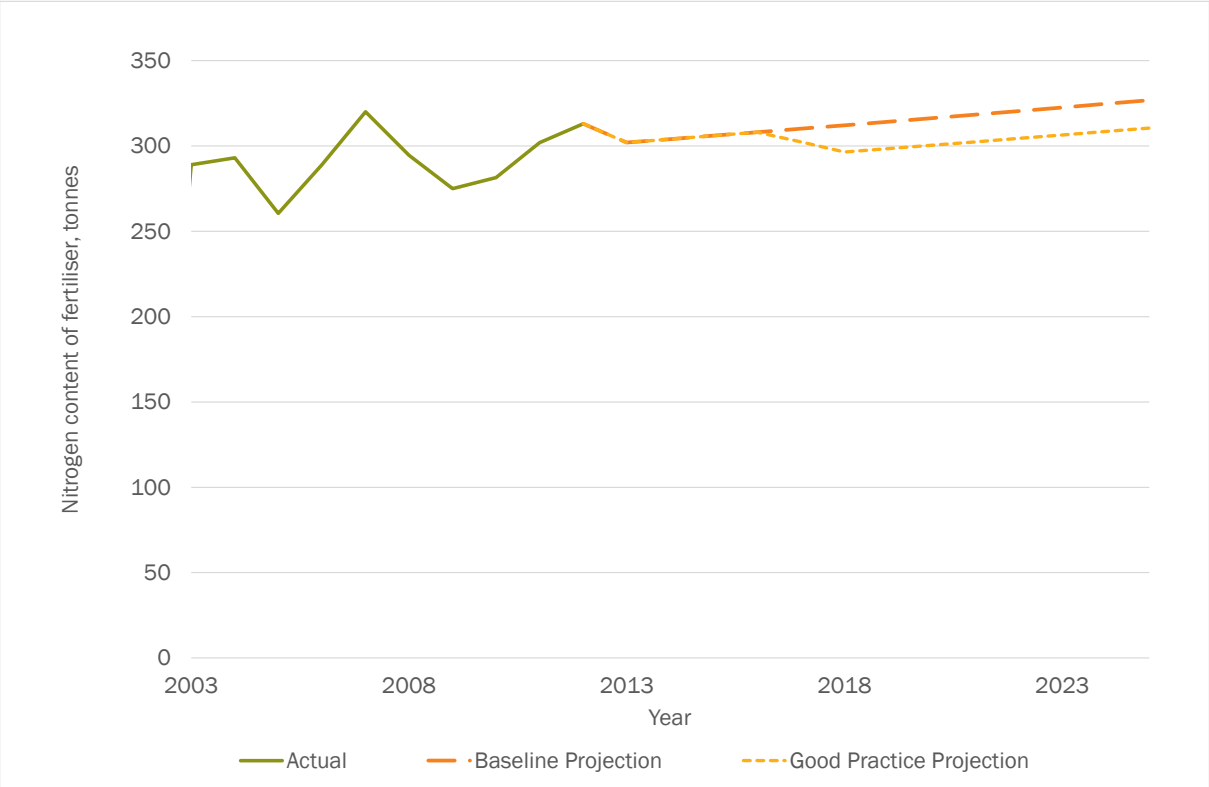


Figure 196: Change in Aggregates Extraction, thousand tonnes

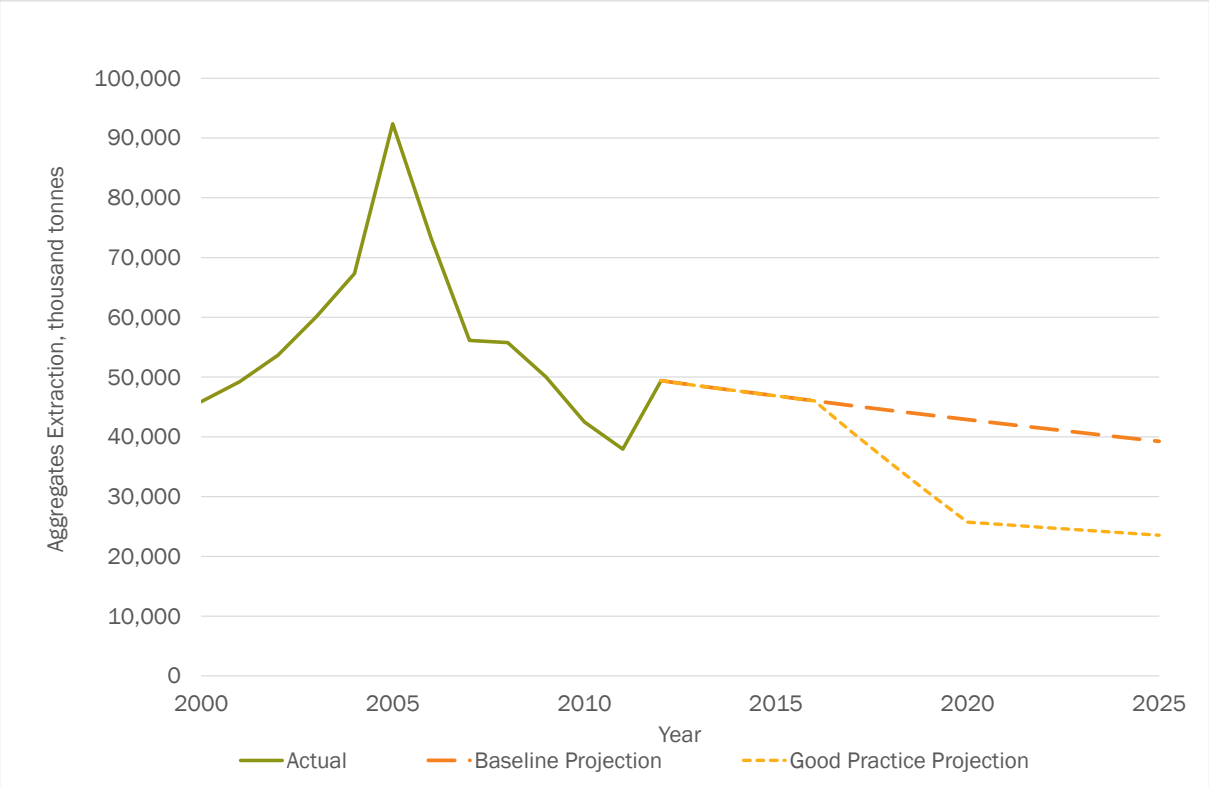


Figure 197: Change in Paper & Card Packaging Generation, thousand tonnes

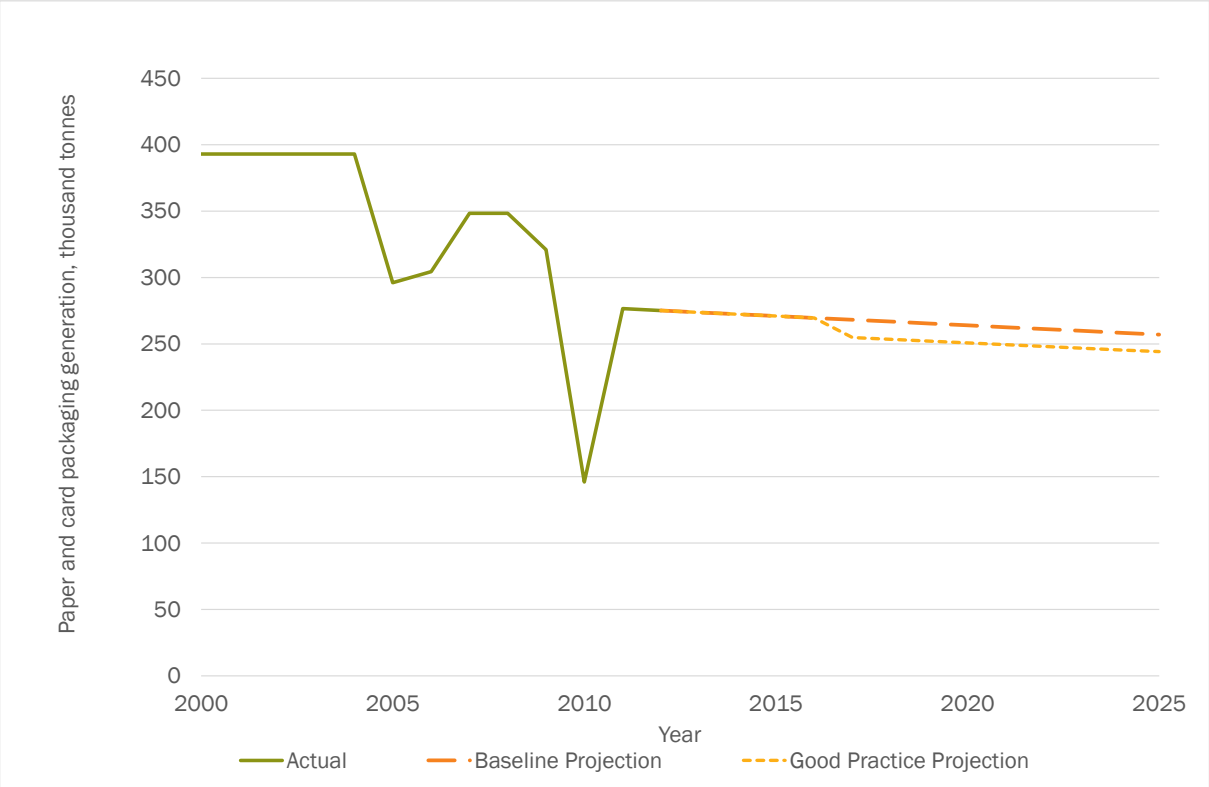


Figure 198: Change in Plastic Packaging Generation, thousand tonnes

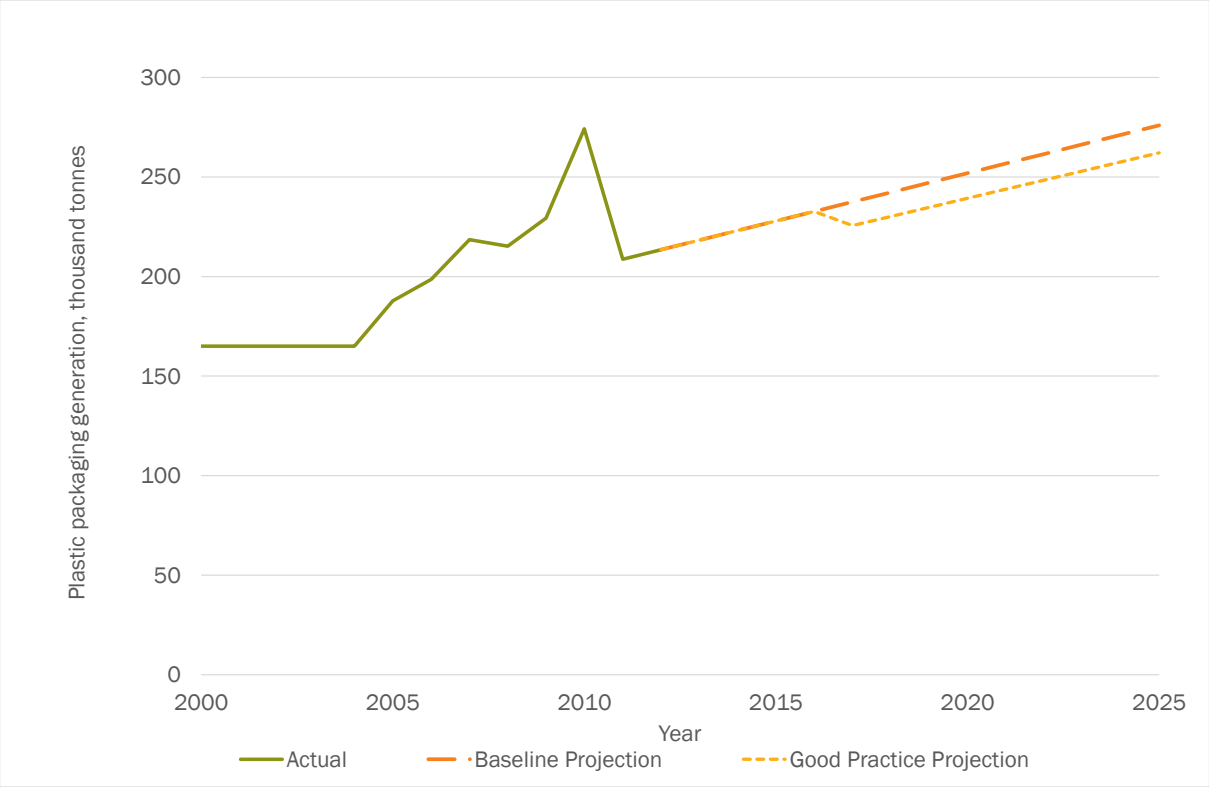


Figure 199: Change in Wood Packaging Generation, thousand tonnes

Figure 200: Change in Metal Packaging Generation, thousand tonnes

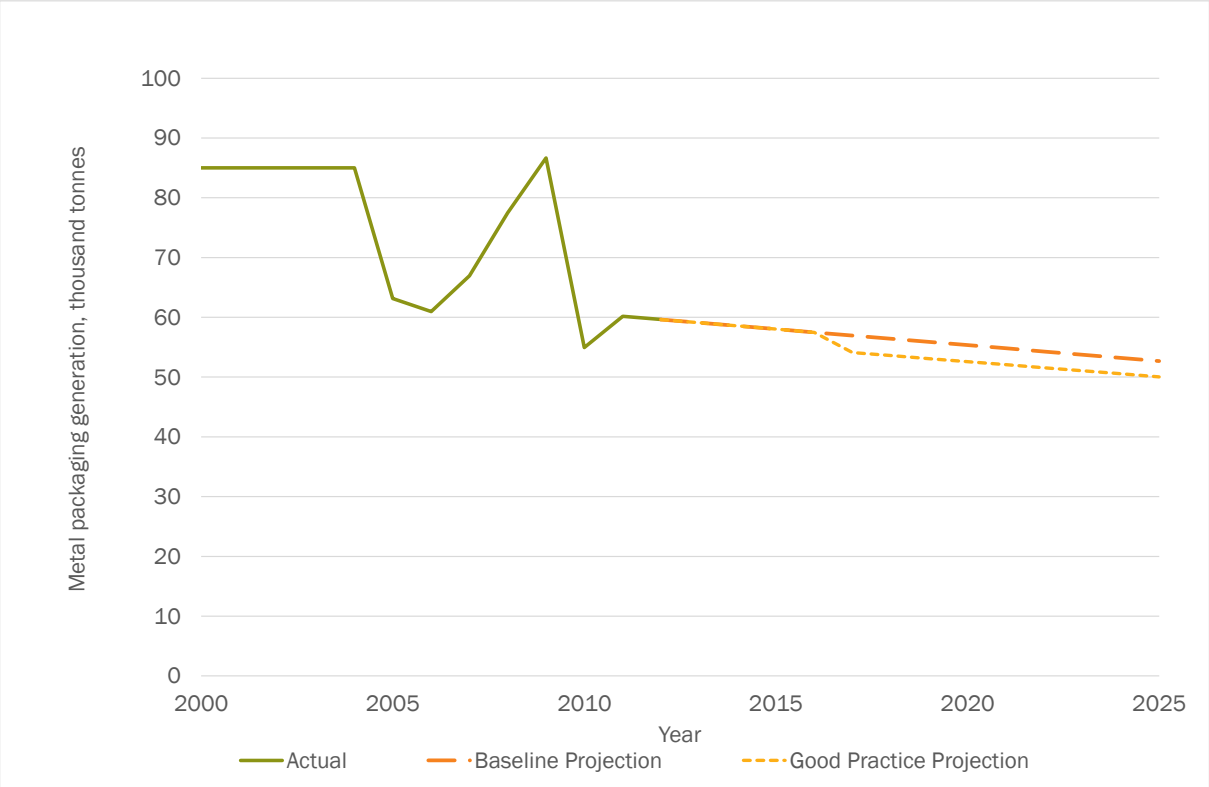


Figure 201: Change in Glass Packaging Generation, thousand tonnes

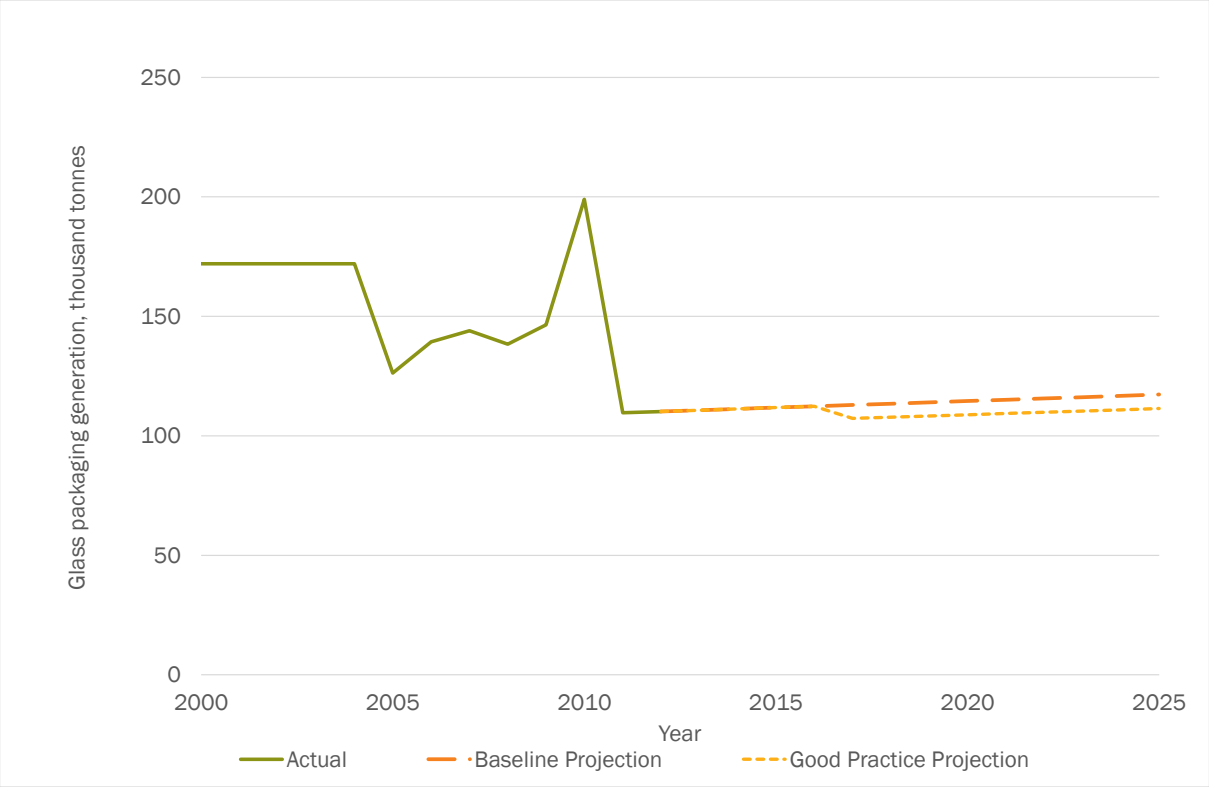
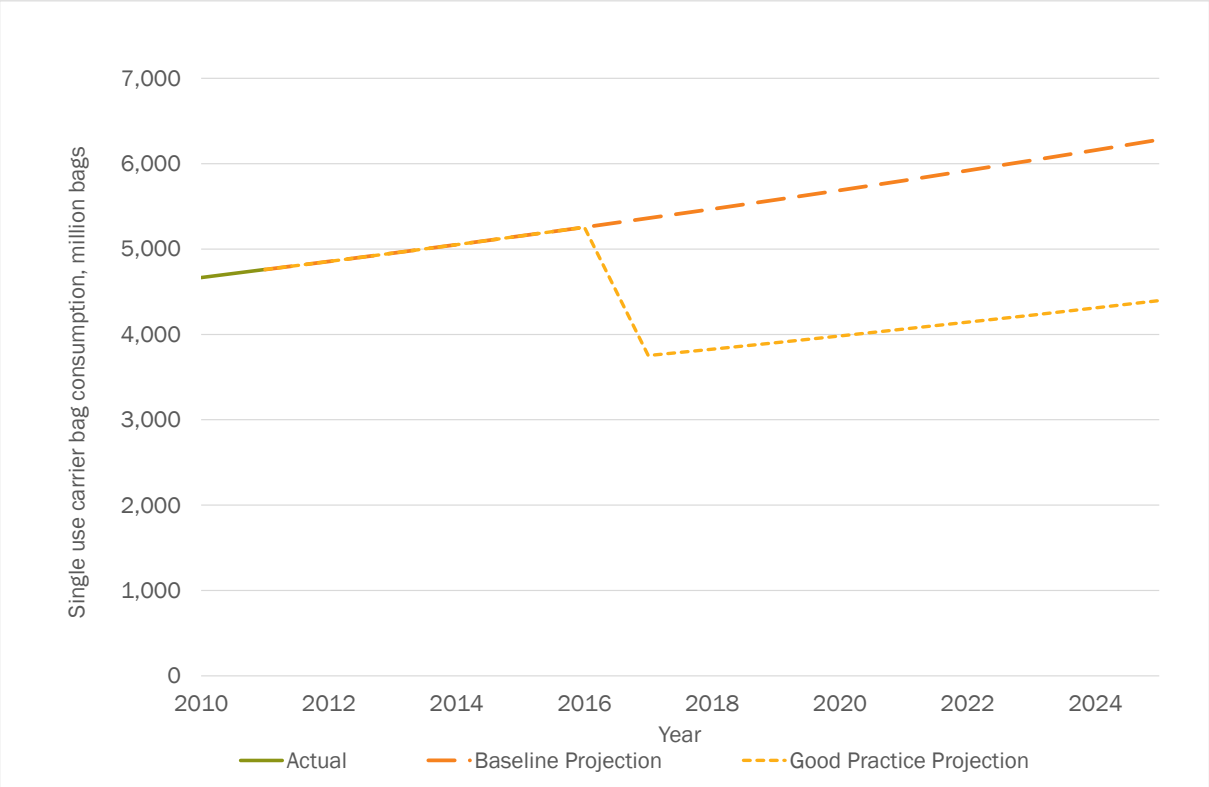


Figure 202: Change in Consumption of Single Use Carrier Bags, million bags



A.11.7 Full Revenue Outputs

Table 201: Revenue Outturns from Model, million HUF (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	5,409	10,798	16,169	21,521	26,856	32,172	37,471	42,753	42,753	42,753
	C&I / Heating	0	0	66,270	128,166	186,347	241,330	293,533	343,292	390,886	436,549	436,549	436,549
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million HUF	*0*	*0*	*71,679*	*138,965*	*202,516*	*262,852*	*320,388*	*375,464*	*428,358*	*479,302*	*479,302*	*479,302*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.4%*	*0.6%*	*0.8%*	*0.9%*	*1.1%*	*1.2%*	*1.3%*	*1.3%*	*1.3%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	24,754	49,920	75,509	101,531	132,353	135,132	137,970	140,867	143,825	146,846
	Passenger Aviation Tax	0	0	42,940	85,144	86,772	88,400	90,028	91,655	93,283	94,911	96,539	98,167
	Freight Aviation Tax	0	0	11.75	23.62	24.35	25.09	25.85	26.62	27.40	28.20	29.01	29.83
	Sub-total Transport, million HUF	*0*	*0*	*67,706*	*135,088*	*162,305*	*189,956*	*222,406*	*226,814*	*231,280*	*235,806*	*240,393*	*245,042*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.4%*	*0.5%*	*0.6%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	0	0	14,028	13,146	12,264	11,383	11,398	11,412	11,425	11,438	11,449
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	1,203	2,763	4,652	5,250	5,836	6,411	6,468	6,527	6,586	6,645	6,706
	Air Pollution Tax	0	2,282	4,078	5,580	6,812	7,801	7,035	6,805	6,586	6,377	6,177	5,985
	Water Abstraction Tax	0	1,224	2,253	3,176	4,000	4,731	4,427	4,300	4,177	4,057	3,941	3,828
	Waste Water Tax	0	3,437	6,644	9,623	9,279	9,279	9,279	9,279	9,279	9,279	9,279	9,279
	Pesticides Tax	0	0	21,598	43,290	43,324	44,467	45,611	46,754	47,898	49,041	50,185	51,328
	Aggregates Tax	0	0	33,163	29,324	25,609	22,016	18,540	18,215	17,897	17,583	17,275	16,973
	Packaging Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Single Use Bag Tax	0	3,141	3,204	939	957	977	996	1,016	1,036	1,057	1,078	1,100
	Fertiliser Tax	0	0	9	18	18	18	18	18	18	18	19	19
	Sub-total Pollution & Resource, million HUF	*0*	*11,287*	*73,713*	*110,630*	*108,396*	*107,388*	*103,700*	*104,255*	*104,830*	*105,424*	*106,036*	*106,667*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, million HUF	0	11,287	213,098	384,683	473,216	560,196	646,494	706,533	764,468	820,533	825,732	831,012
	Total, % GDP	0.0%	0.0%	0.7%	1.2%	1.5%	1.7%	1.9%	2.0%	2.2%	2.3%	2.2%	2.2%

A.12.0Italy: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

A.12.1 Energy

Table 202: Standard Rates of Excise Duties on Fuels and Electricity in Italy

Excise Duty	Unit	Rate Applied in Italy
Transport Fuels		
Leaded Petrol	€ per 1000 litres	€728.40
Unleaded Petrol	€ per 1000 litres	€728.40
Gas Oil (Diesel)	€ per 1000 litres	€617.40
Kerosene	€ per 1000 litres	€337.49
Liquid Petroleum Gas	€ per 1000 kg	€267.77
Natural Gas	€ per GJ	€0.09
Motor Fuels – Industry / Commercial Use		
Gas Oil (Diesel)	€ per 1000 litres	€185.22
Kerosene	€ per 1000 litres	€101.25
Liquid Petroleum Gas	€ per 1000 kg	€80.33
Natural Gas	€ per GJ	€0.32
Heating – Business Use		
Gas Oil (Diesel)	€ per 1000 litres	€403.21

Excise Duty	Unit	Rate Applied in Italy
Kerosene	€ per 1000 litres	€337.49
Heavy Fuel Oil	€ per 1000 kg	€63.75
Liquid Petroleum Gas	€ per 1000 kg	€18.99
Natural Gas	€ per GJ	€0.34
Coal and Coke	€ per GJ	€0.16
Heating – Non-Business Use		
Gas Oil (Diesel)	€ per 1000 litres	€403.21
Kerosene	€ per 1000 litres	€337.49
Heavy Fuel Oil	€ per 1000 kg	€128.27
Liquid Petroleum Gas	€ per 1000 kg	€189.94
Natural Gas	€ per GJ	€1.19 - €5.03[1]
Coal and Coke	€ per GJ	€0.32
Electricity		
Business Use	€ per MWh	€12.50
Non-Business Use	€ per MWh	€22.70
Notes: 1. Exact rate dependent on the annual consumption of natural gas		

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

A.12.2 Transport (excl. transport fuels)[899]

- Motor vehicles tax - Public motor vehicle register tax:
  - Tax rate set by: central and local authority
  - Beneficiary: local authority
  - Rates:
    - Rates depend on the type and the capacity of the vehicle.

[899] Data from DG TAXUD Taxes in Europe Database http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

        - Provincial authorities may increase the tax rates by up to 30%
    - Revenue: In 2011, revenues were EUR 1,248 million, equivalent to 0.08% of GDP
- Motor vehicles tax - Regional motor-vehicle tax:
    - Tax rate set by: central and regional authority
    - Beneficiary: regional authority
    - Rates: Established by regional law, at not less than 90 % nor more than 110 % of the amount established for the previous year
    - Revenue: In 2011, revenues were EUR 6,727 million, equivalent to 0.43% of GDP.

- Motor vehicle tax - Tax on motor vehicles:
    - Tax rate set by: central authority
    - Beneficiary: central and regional authority
    - Rates: no data
    - Revenue: no data

A.12.3 Pollution and Resources[900]

- Municipal tax on waste and services:
    - Tax rate set by: local authority
    - Beneficiary: local authority
    - Rates:
        - The municipality approves the tariffs within the time limit set for budget approval, in accordance with the financial plan of the urban waste management service.
        - The financial plan is the necessary reference basis for the determination of tariffs and includes every year a definition of the costs related to the service
    - Revenue:
        - No data

[900] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=38/1357119656&taxType=Other+indirect+tax

        - Tax paid quarterly

- Regional special tax on landfill dumping:
    - Tax rate set by: regional authority
    - Beneficiary: regional authority
        - 20% of the revenue from this tax, net of the 10% quota due to provinces, flows in a regional fund destined to promote recycling of raw materials and energy
    - Taxpayers: Landfill operators, based on the quantity of waste tipped and waste incinerated in plant without energy recovery
    - Rates:
        - the tax is calculated by multiplying the tax rate by the dumped waste weight in kilograms, and by a correction coefficient measuring the impact on environmental costs
        - mot less than Euro 0.001 and not less than Euro 0.01 for waste that can be disposed of in inert waste facilities
        - not less than Euro 0.00517 and not more than Euro 0.02582 for waste that can be disposed of in hazardous and non-hazardous waste facilities
    - Revenue: In 2011, revenues were EUR 200 million, equivalent to 0.01% of GDP.
- Tax on emissions of sulphur dioxide (S02) and nitrogen oxides (N02):
    - Tax rate set by: central authority
    - Beneficiary: central authority
    - Rates:
        - € 106 per t/year of sulphur dioxide
        - € 209 per t/year of nitrogen oxides
    - Revenue: In 2011, revenues were EUR 13 million, equivalent to 0.00% of GDP.
- Provincial environmental protection tax:
    - Tax rate set by: central and local authority
    - Beneficiary: local authority
    - Tax object: Tax is payable for buildings on which Municipalities charge the tax for disposal of urban solid waste
    - Rates: no data
    - Revenue: In 2011, revenues were EUR 273 million, equivalent to 0.02% of GDP.
- Tax for disposal of domestic urban solid waste:
    - Tax rate set by: local authority

- Beneficiary: local authority
- Tax object / assessment:
  - Tax is due for the occupation of premises or uncovered areas regardless of the use made of them
  - Measure of the surface in square meters. The tax is levied in proportion to the persons occupying the premises. The areas where, due to their destination, toxic or noxious waste are produced are not included in the taxable area since such waste shall be disposed of by the producers at their own expenses
- Rates:
  - Each year, by 31 October, all municipalities shall set the rates to be applied the following year.
  - Failing a decision within that deadline, the current rates shall apply
- Revenue: no data

A.12.4 Change in Tax Bases

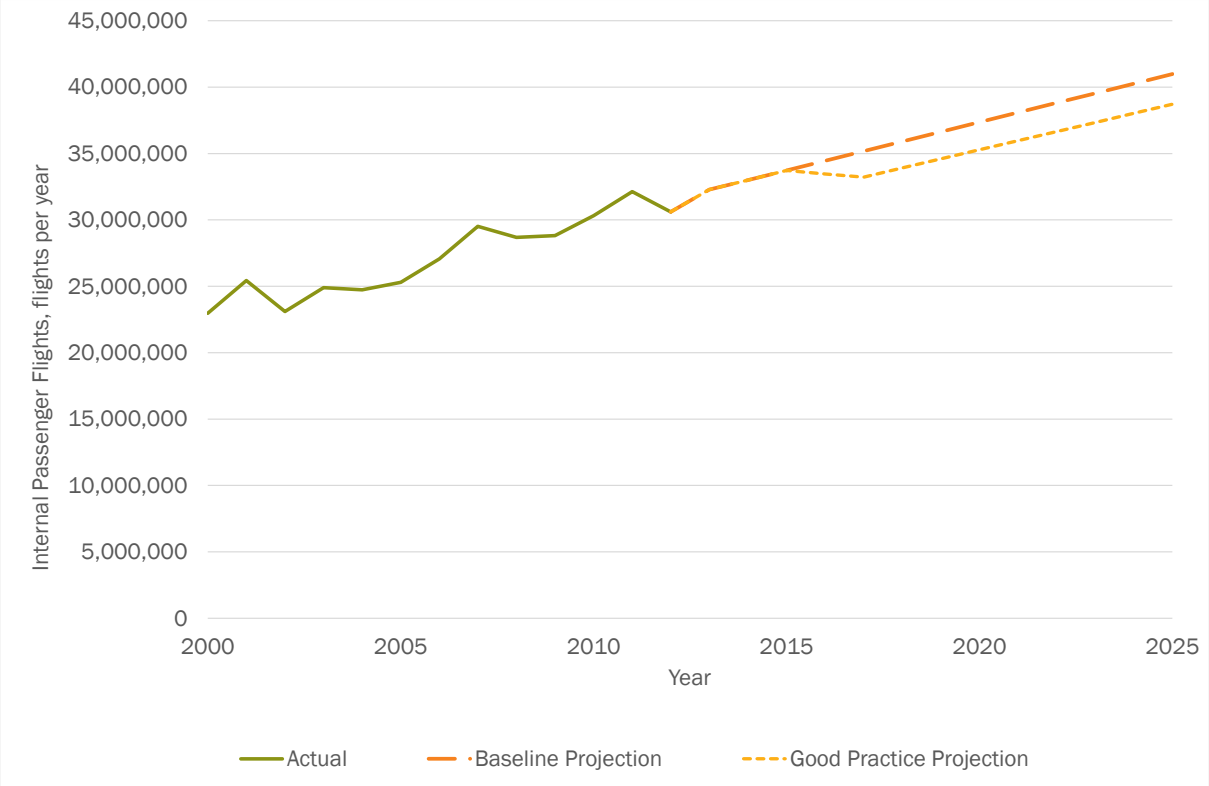
Table 203: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	26,832	26,208	-623
Petrol	million litres	10,162	10,162	0
Kerosene	million litres	3,911	3,911	0
LPG	thousand tonnes	2,628	2,337	-291
Heavy Fuel Oil	thousand tonnes	987	950	-37
Natural Gas	TJ (GCV)	1,348,460	1,286,881	-61,579
Coal	thousand tonnes	4,196	3,449	-747
Electricity	GWh	303,426	298,240	-5,187

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes

directly from the European Reference Model on Solid Municipal Waste Management.[901] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

Figure 203: Change in Internal Passenger Flights, flights per year



[901] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 204: Change in Intra-EU Passenger Flights, flights per year

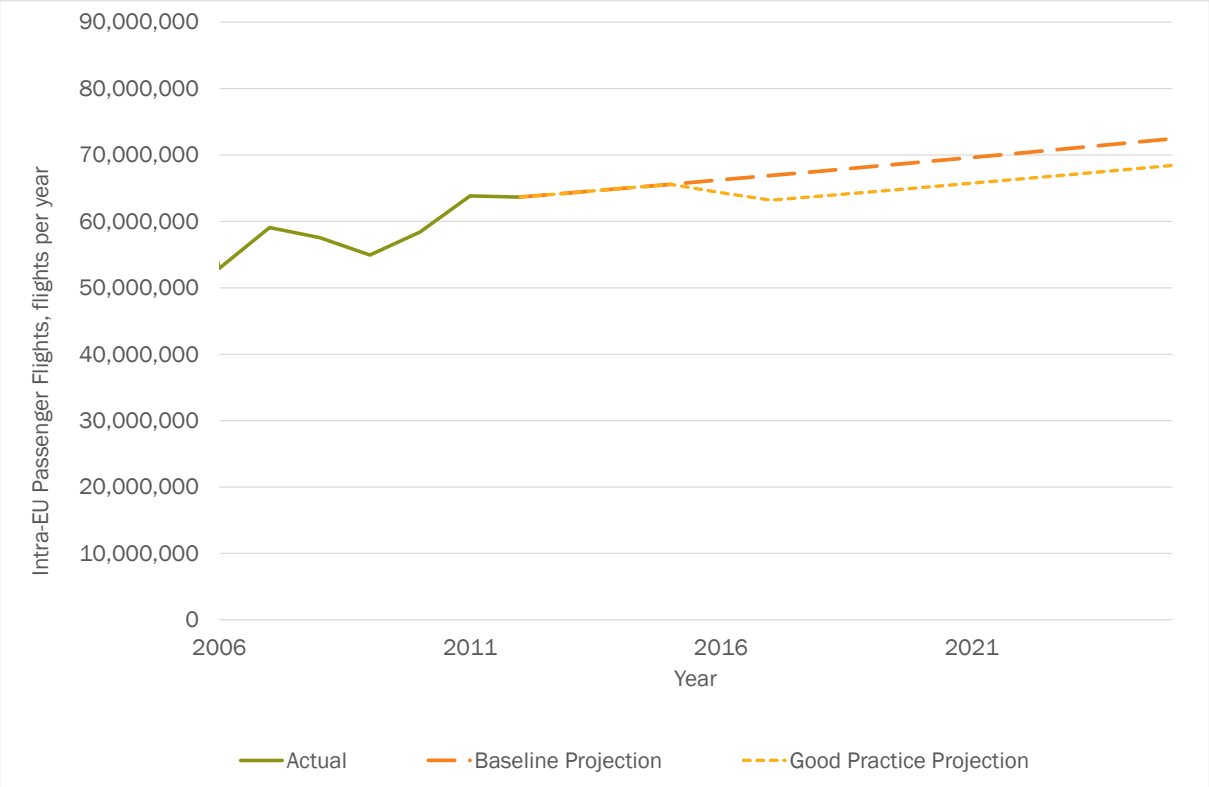


Figure 205: Change in Extra-EU Passenger Flights, flights per year

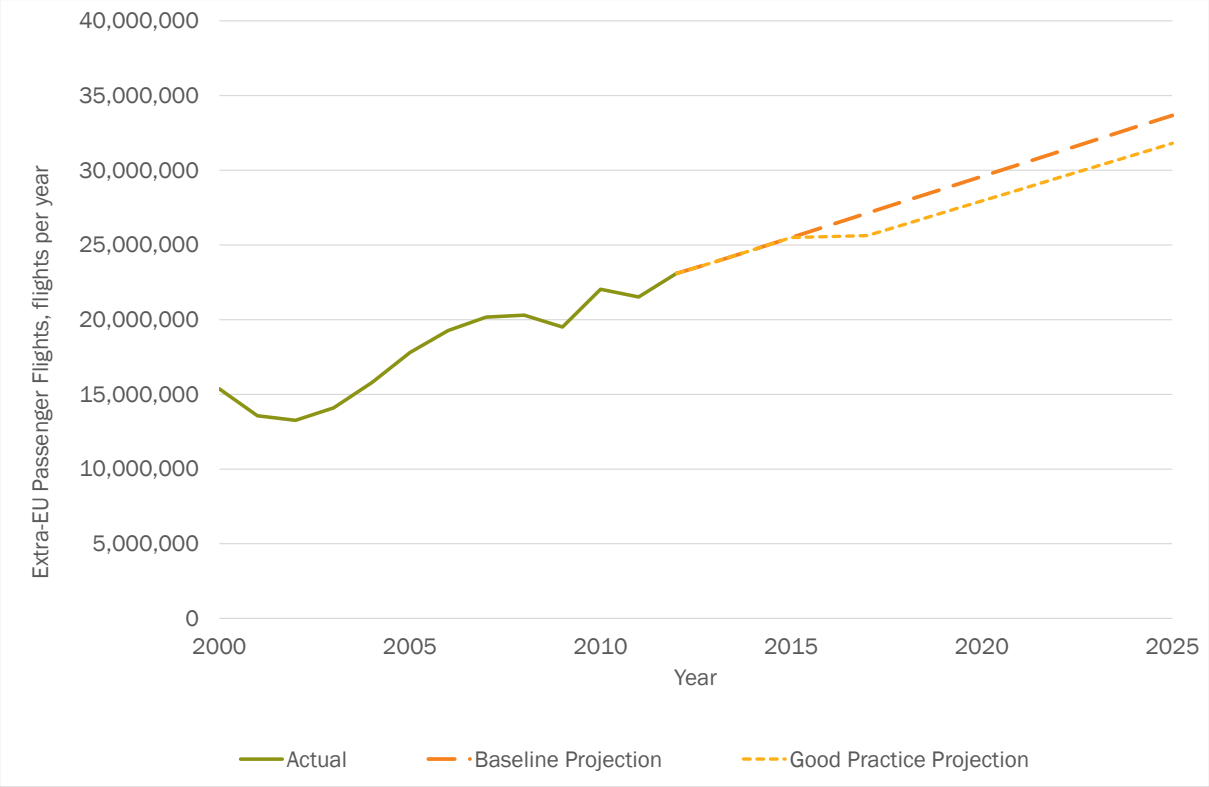


Figure 206: Change in Internal Air-freight, tonnes

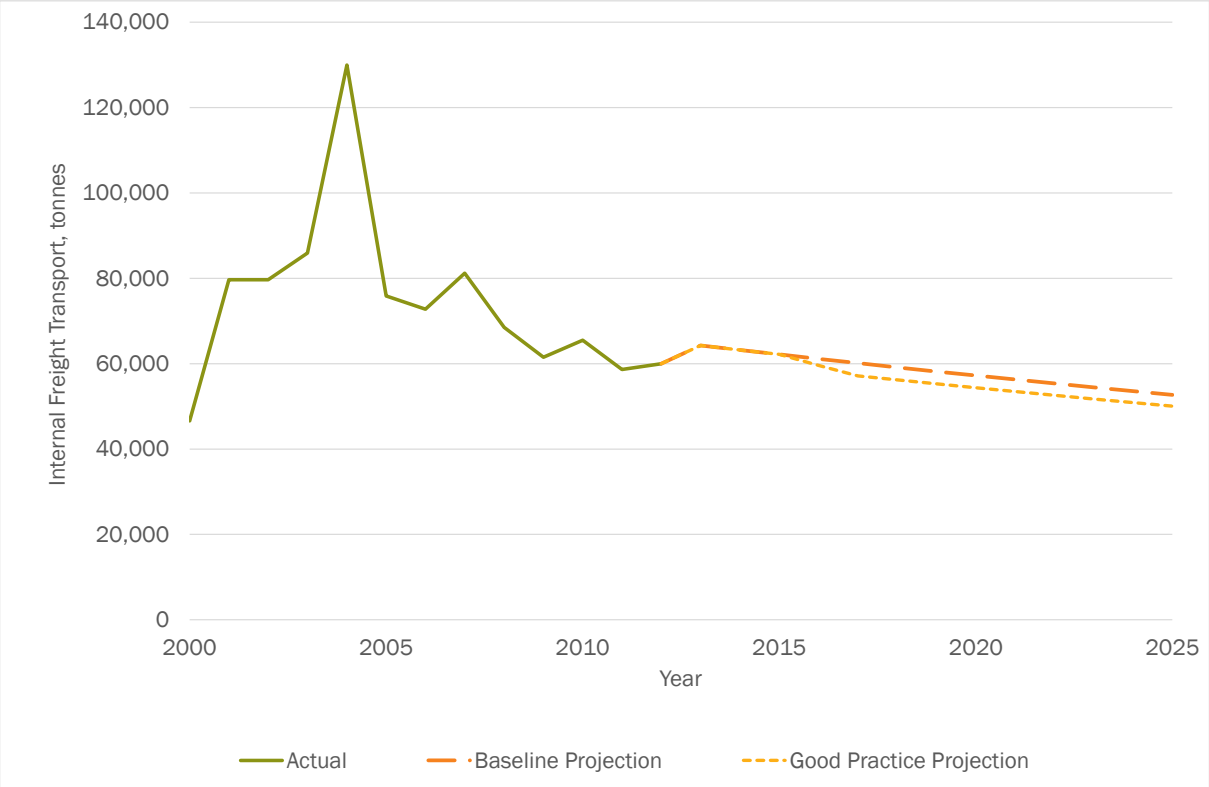


Figure 207: Change in Intra-EU Air-freight, tonnes

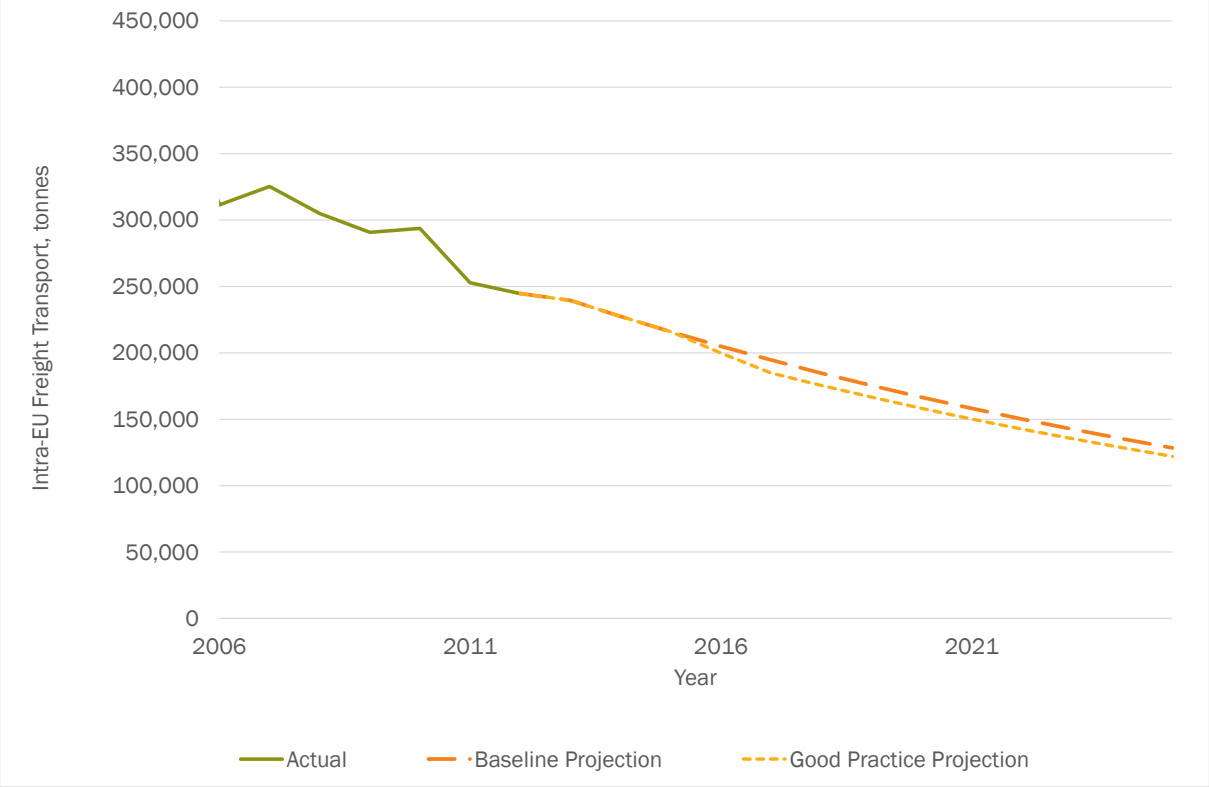


Figure 208: Change in Extra-EU Air-freight, tonnes

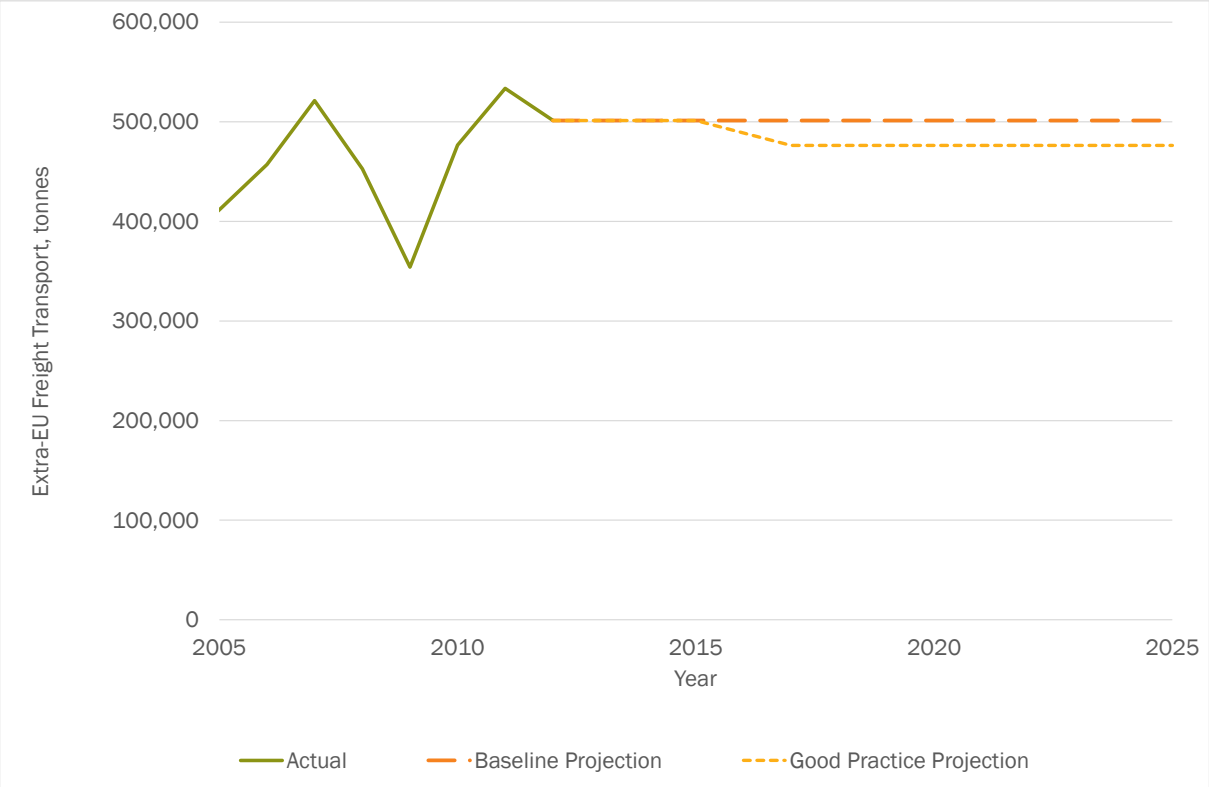


Figure 209: Change in Non-Hazardous Waste Landfilled, thousand tonnes

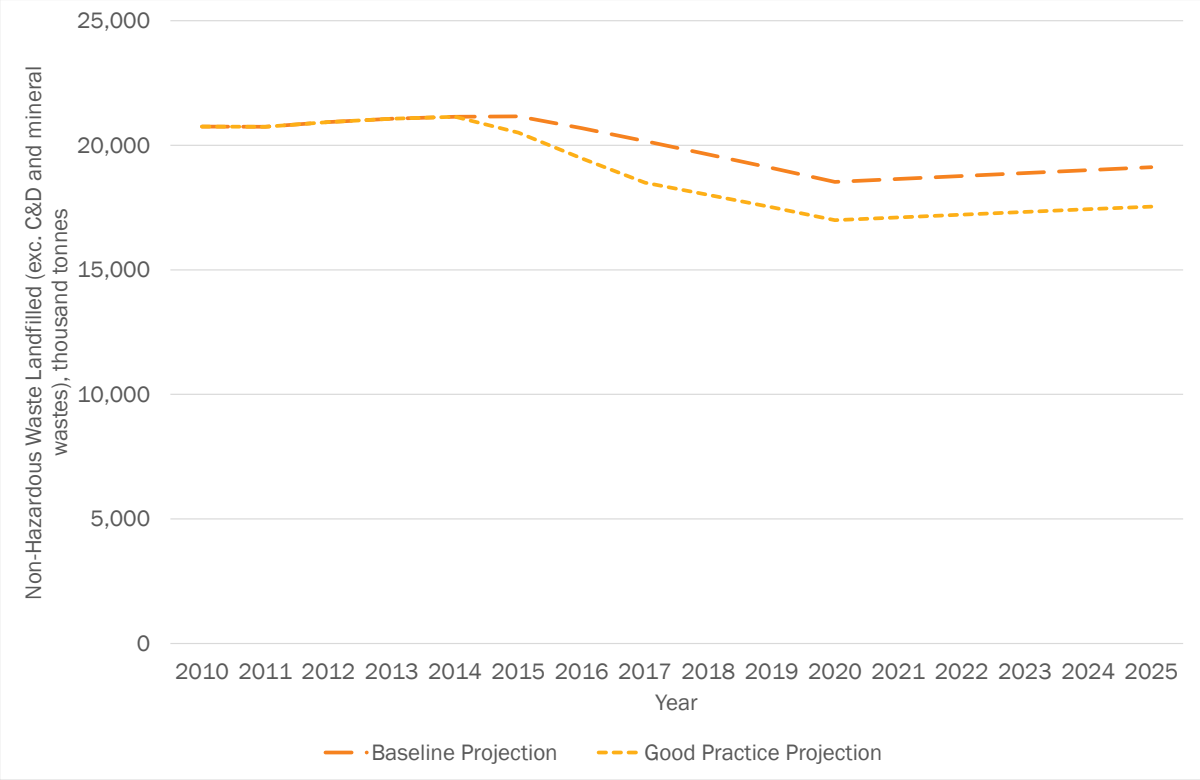


Figure 210: Change in MBT/ Incineration, thousand tonnes

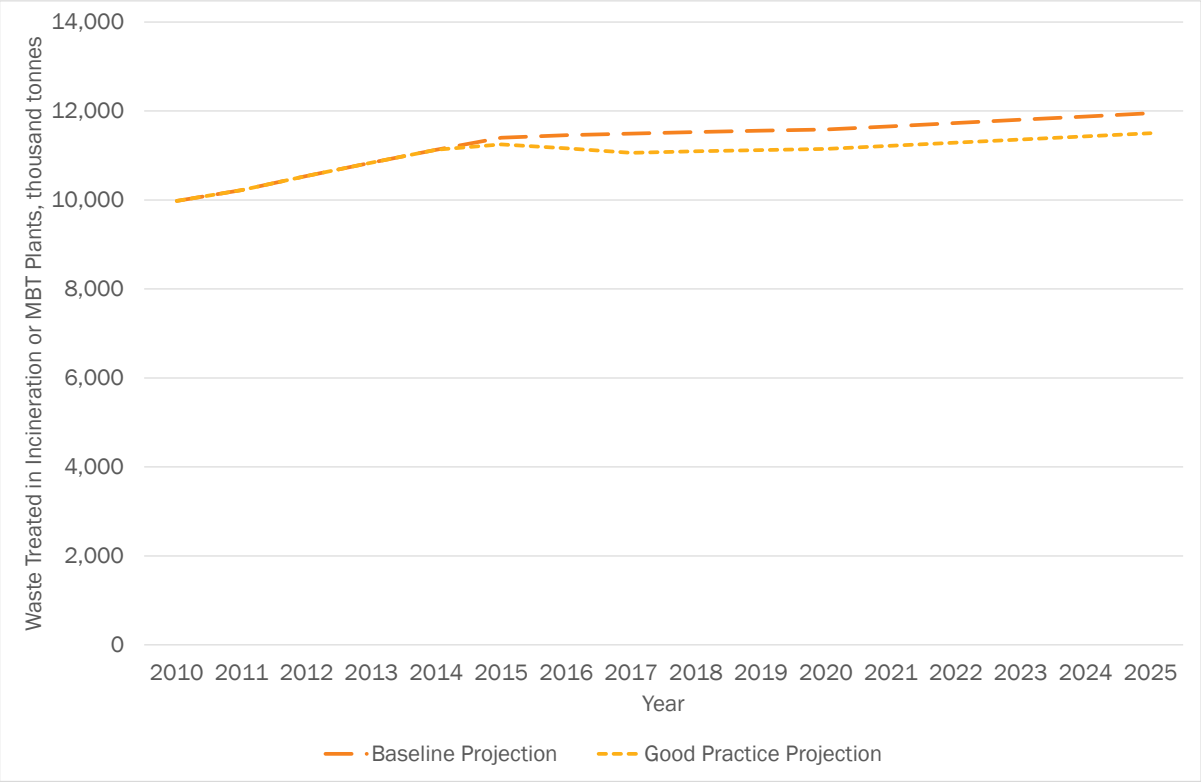


Figure 211: Change in SOx Emissions, tonnes

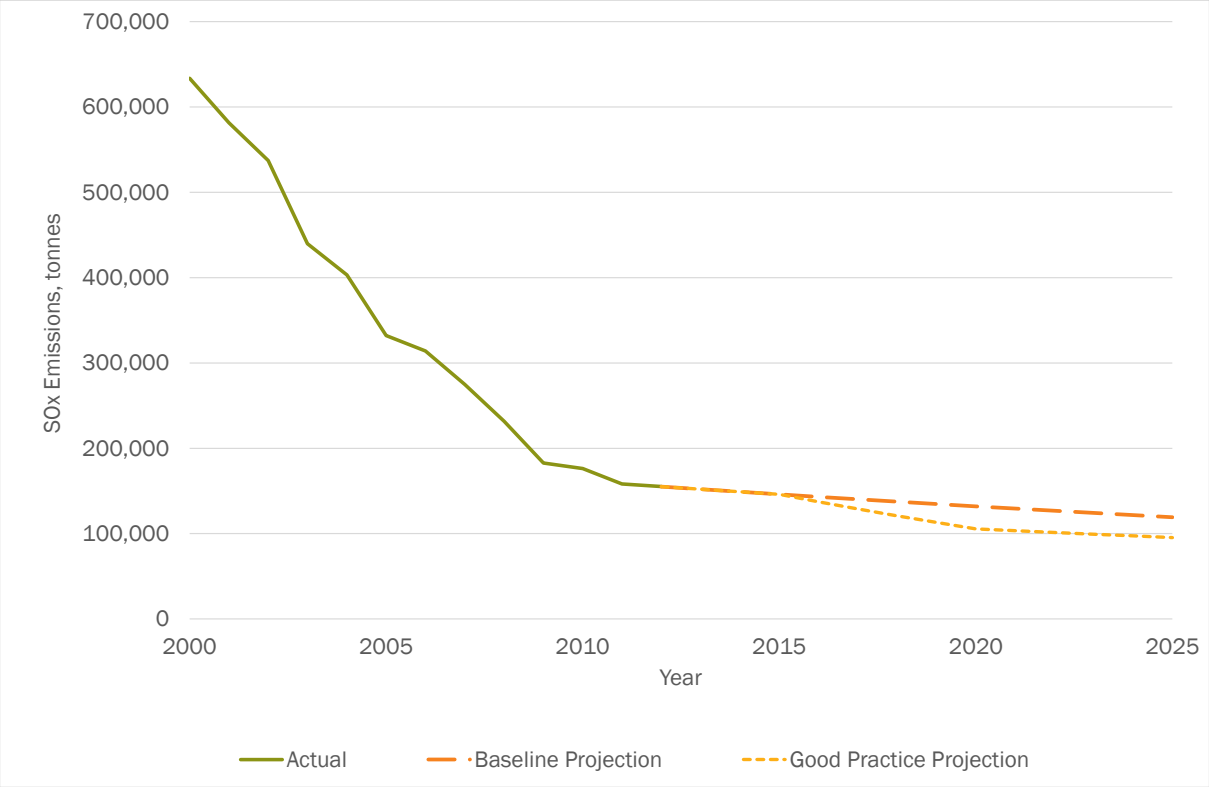


Figure 212: Change in NOx Emissions, tonnes

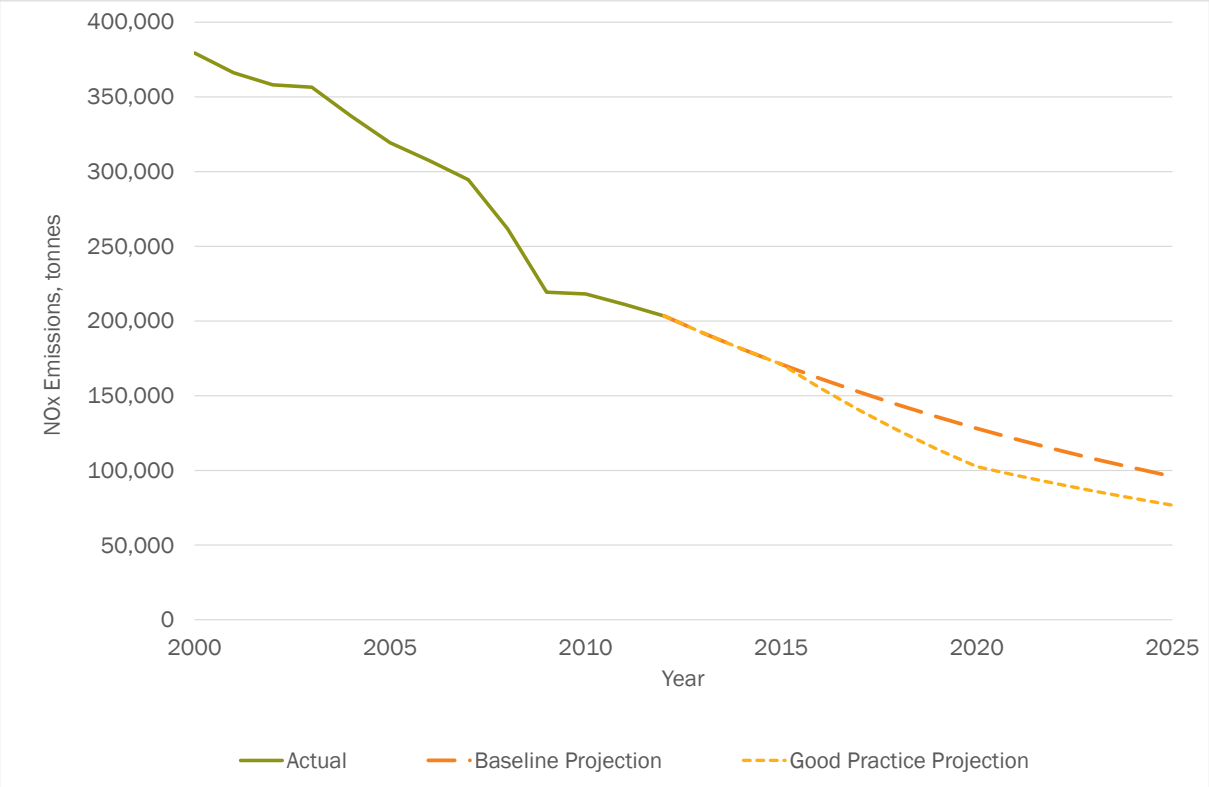


Figure 213: Change in PM_{10} Emissions, tonnes

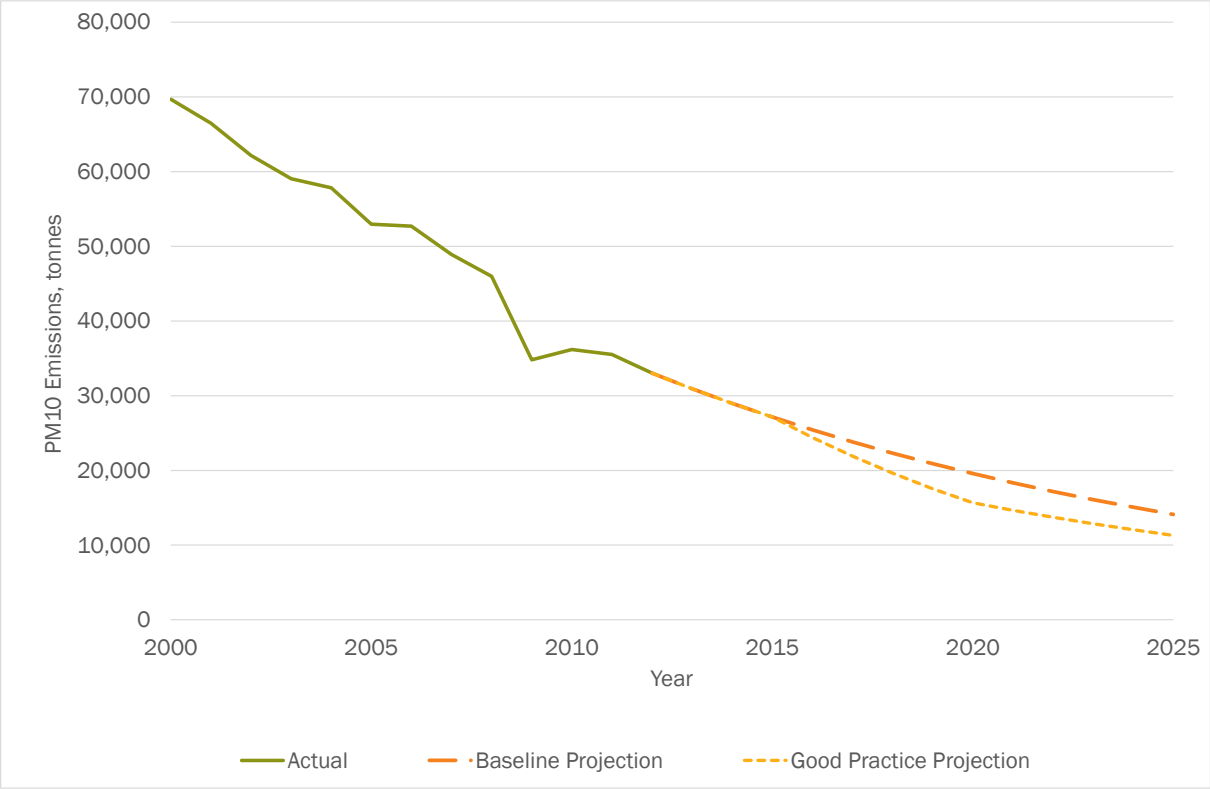


Figure 214: Change in Groundwater Abstraction – Public Supply, million cubic metres

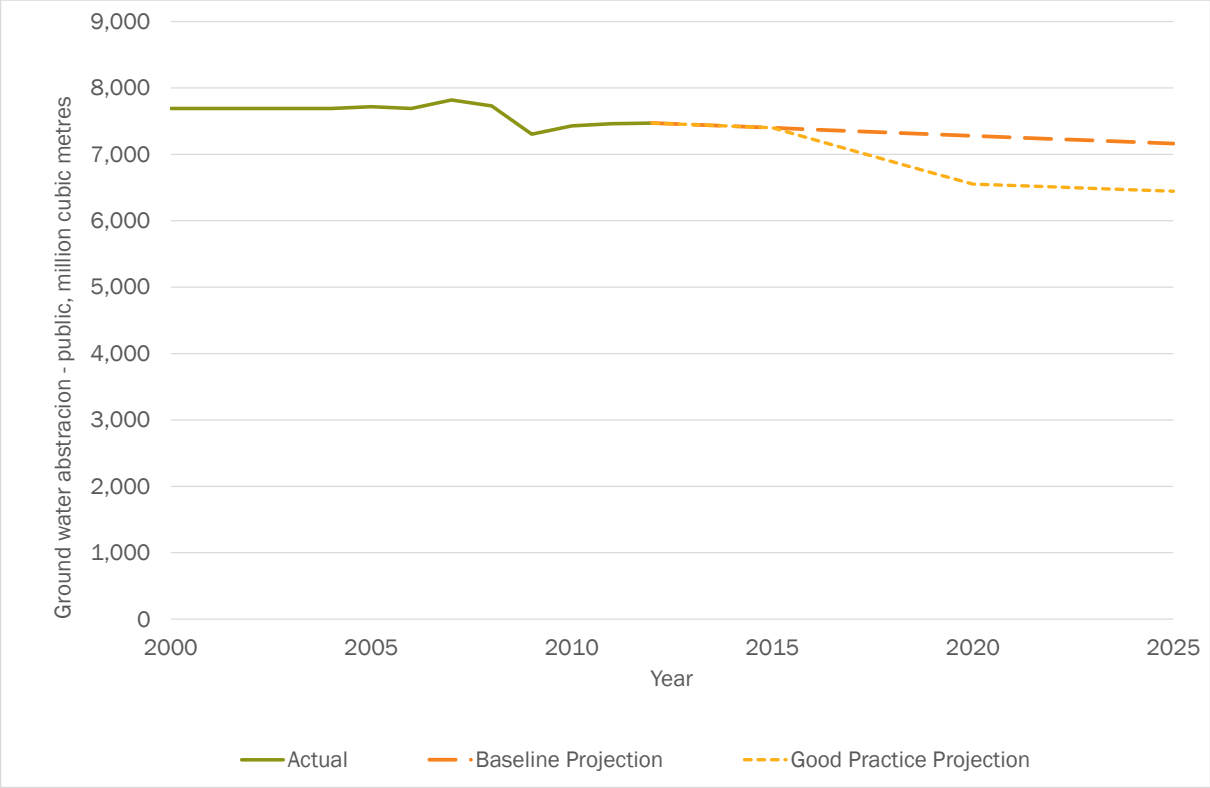


Figure 215: Change in Groundwater Abstraction – Manufacturing, million cubic metres

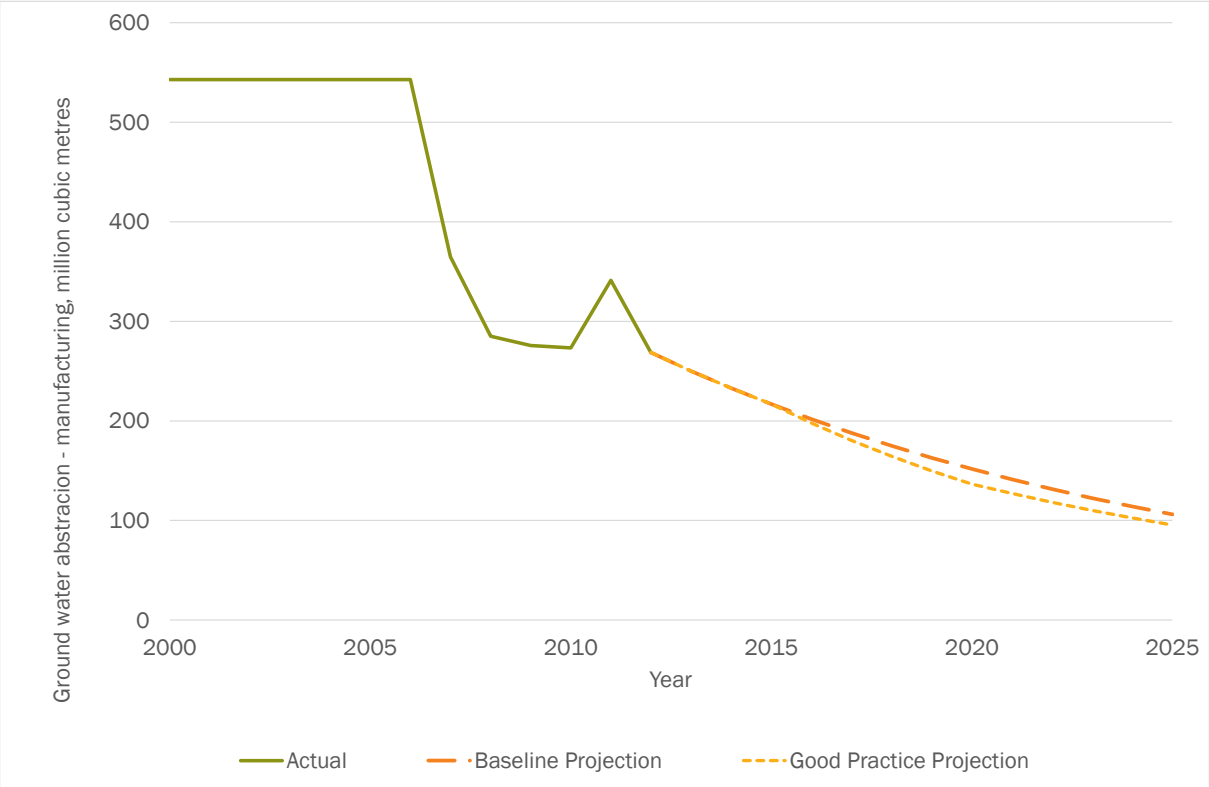


Figure 216: Change in Groundwater Abstraction – Agriculture, million cubic metres

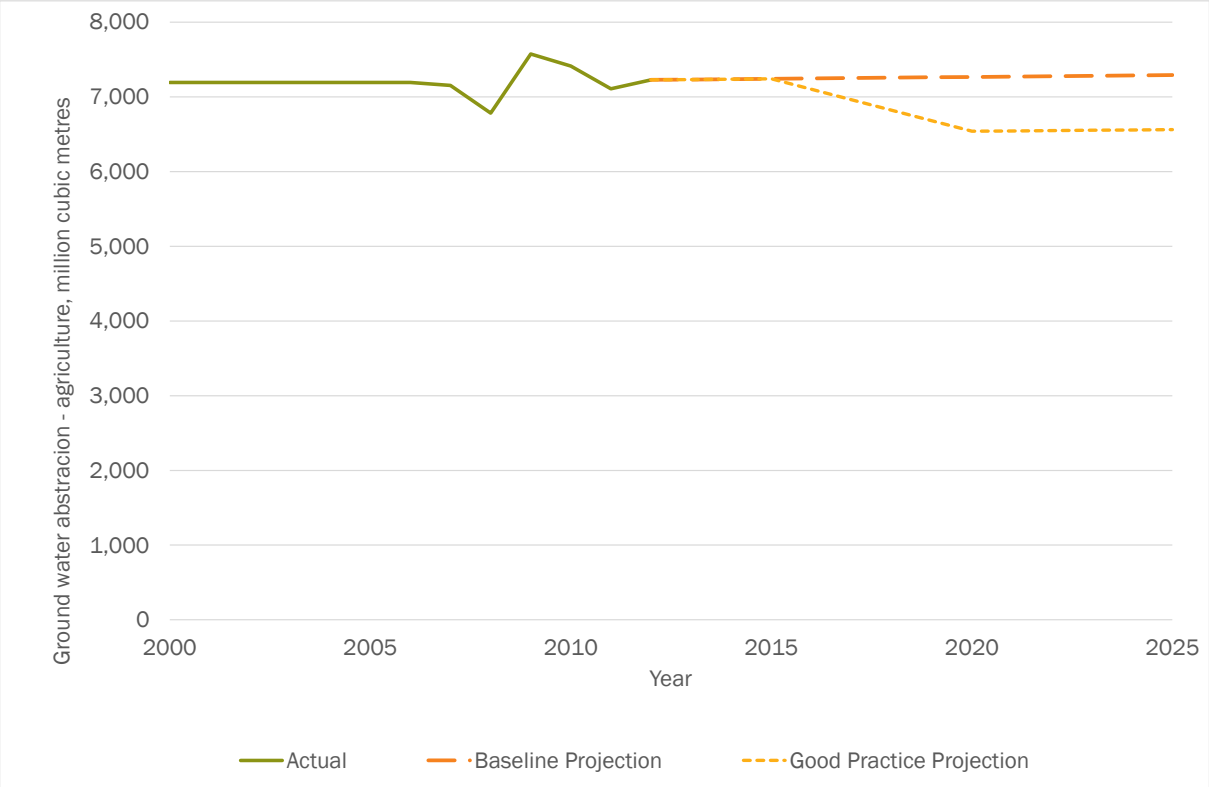


Figure 217: Change in Surface Water Abstraction – Public Supply, million cubic metres

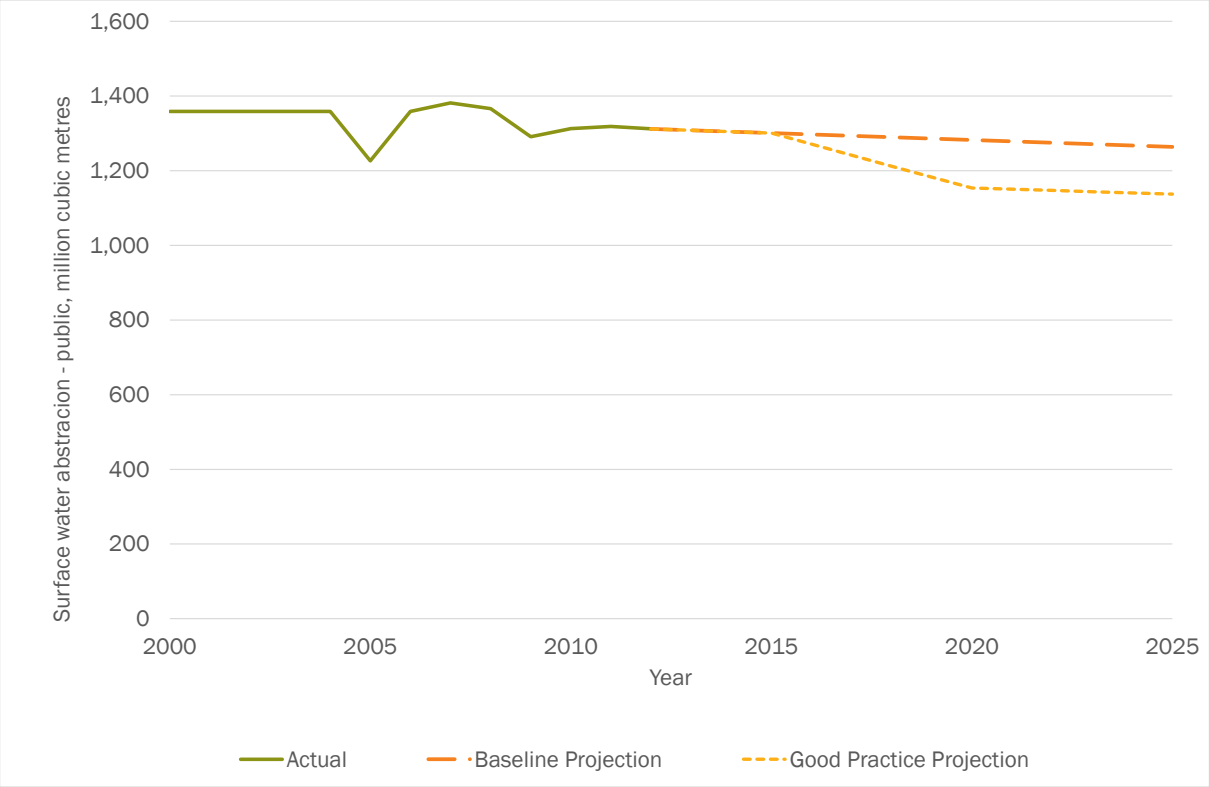


Figure 218: Change in Surface Water Abstraction – Manufacturing, million cubic metres

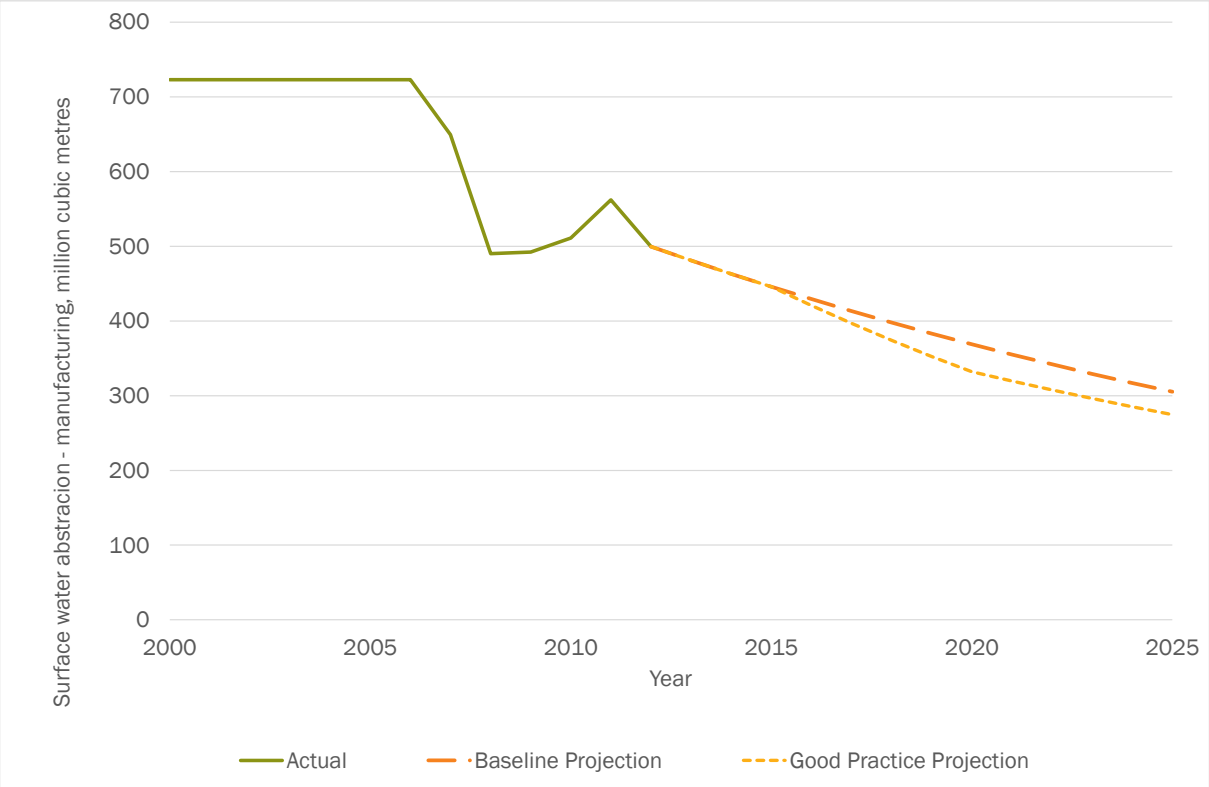


Figure 219: Change in Surface Water Abstraction – Agriculture, million cubic metres

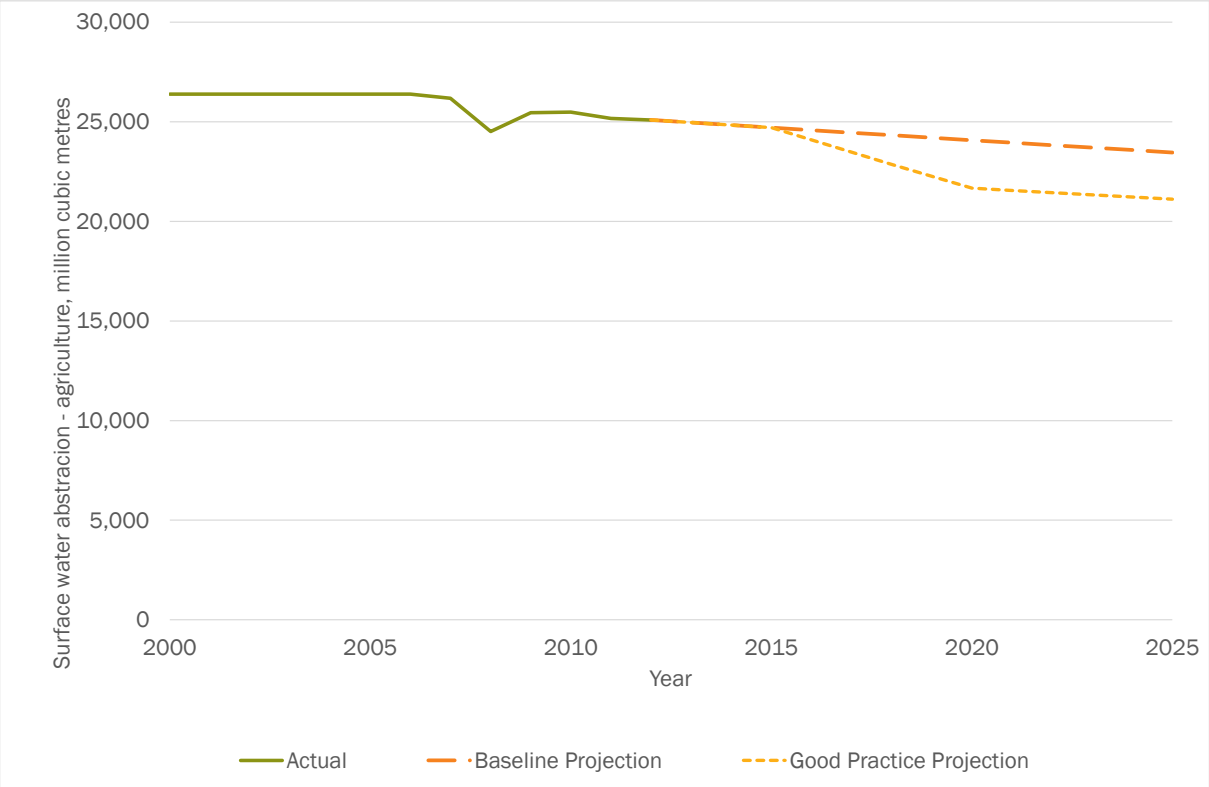


Figure 220: Change in Active Ingredients in Pesticides, tonnes

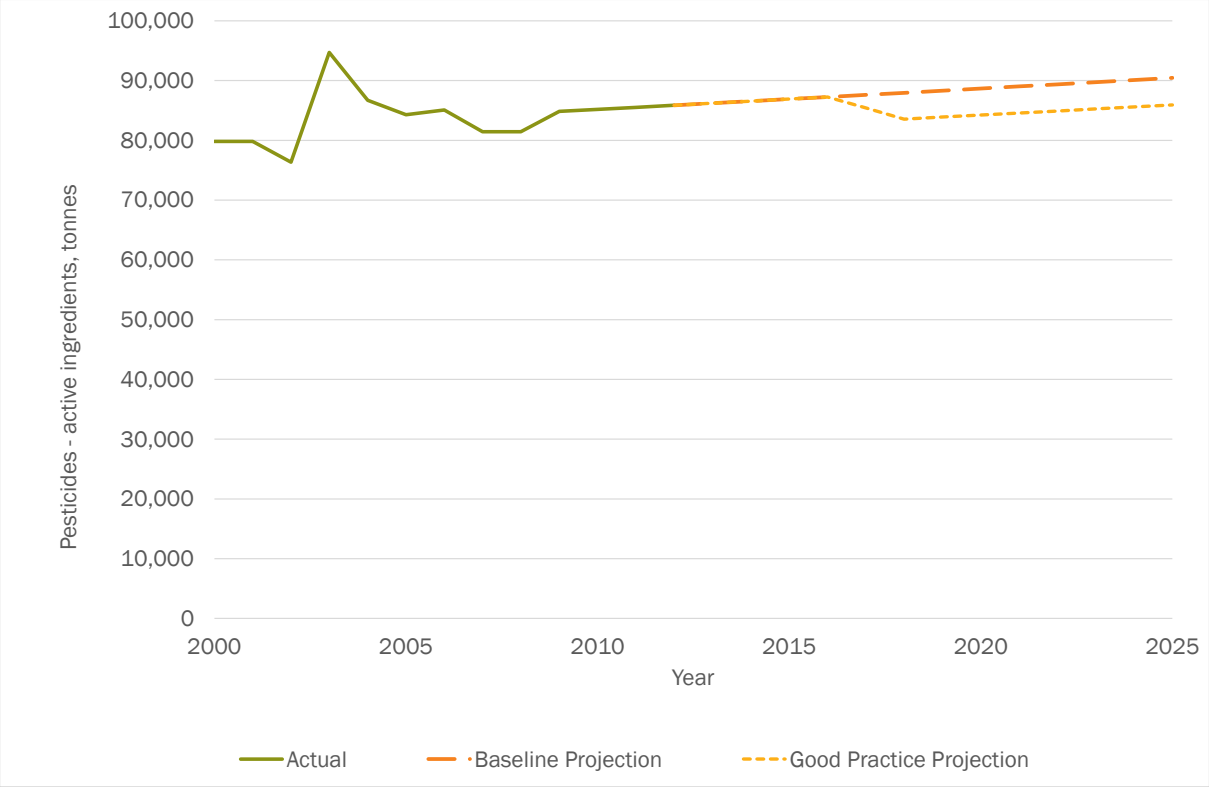


Figure 221: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

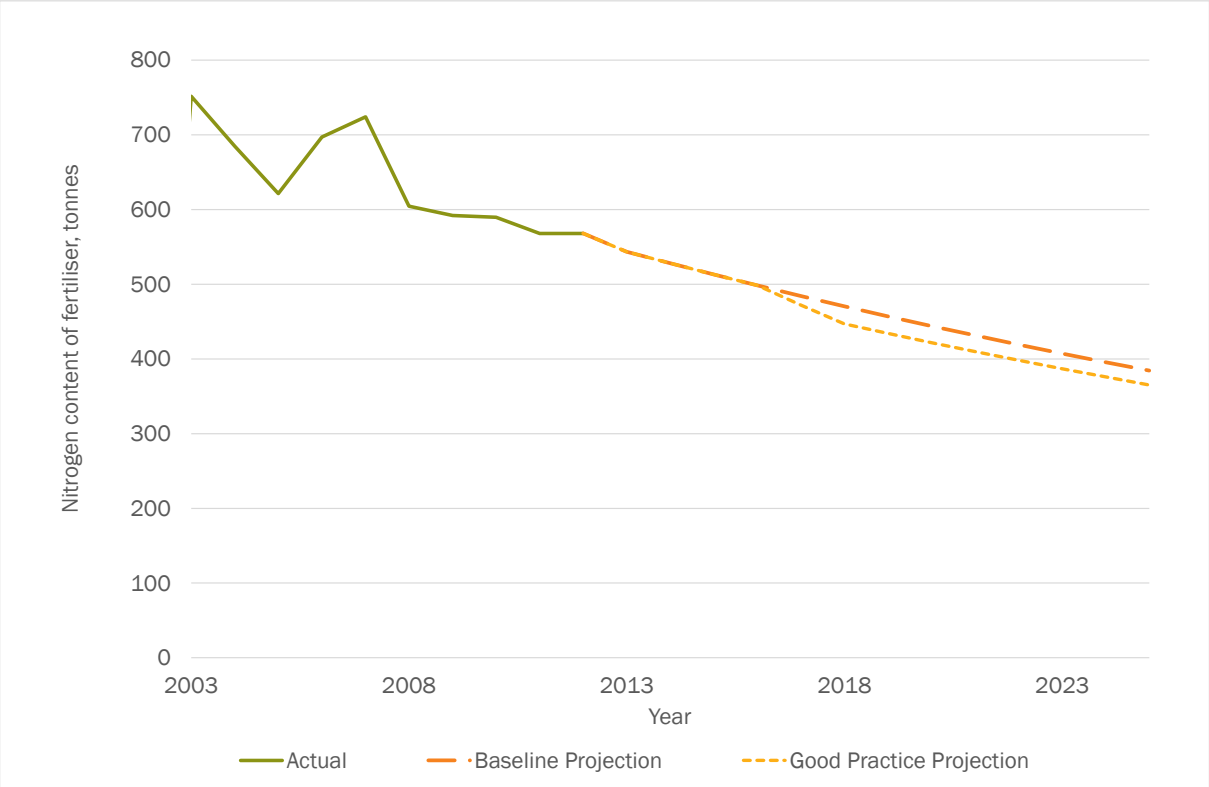


Figure 222: Change in Aggregates Extraction, thousand tonnes

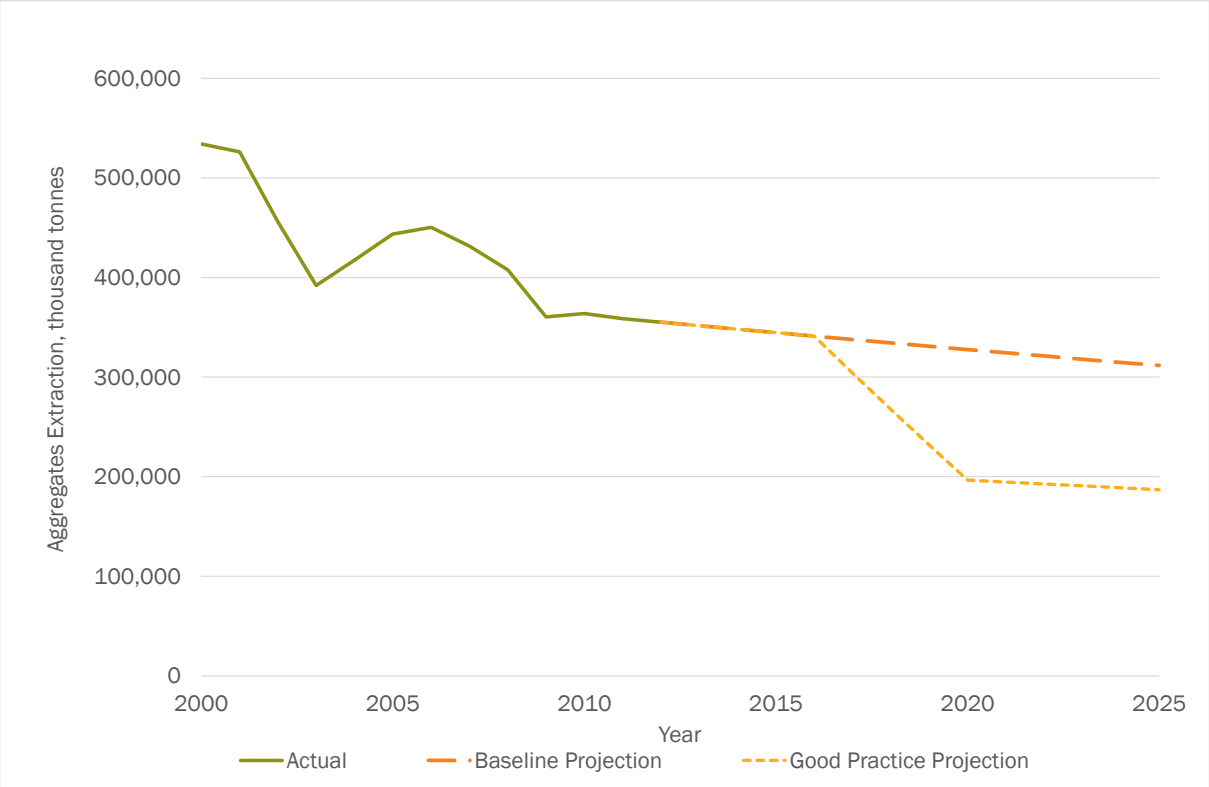


Figure 223: Change in Paper & Card Packaging Generation, thousand tonnes

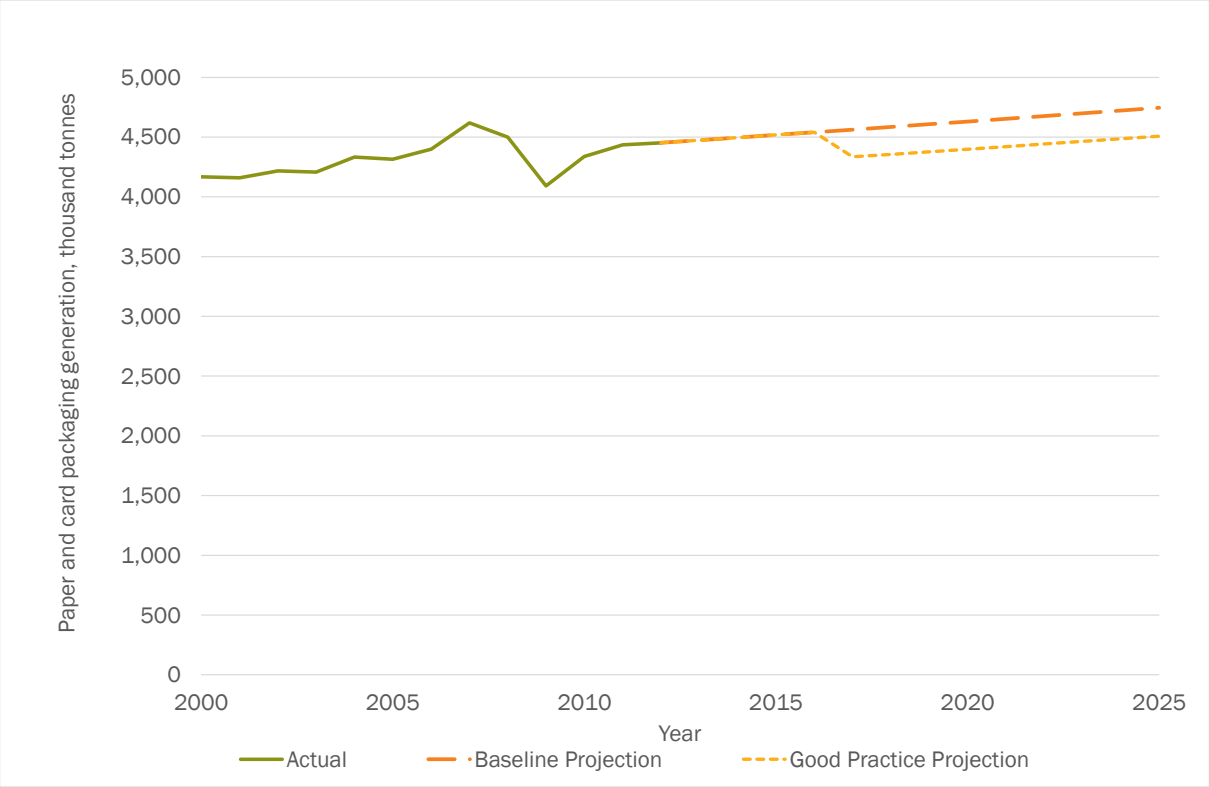


Figure 224: Change in Plastic Packaging Generation, thousand tonnes

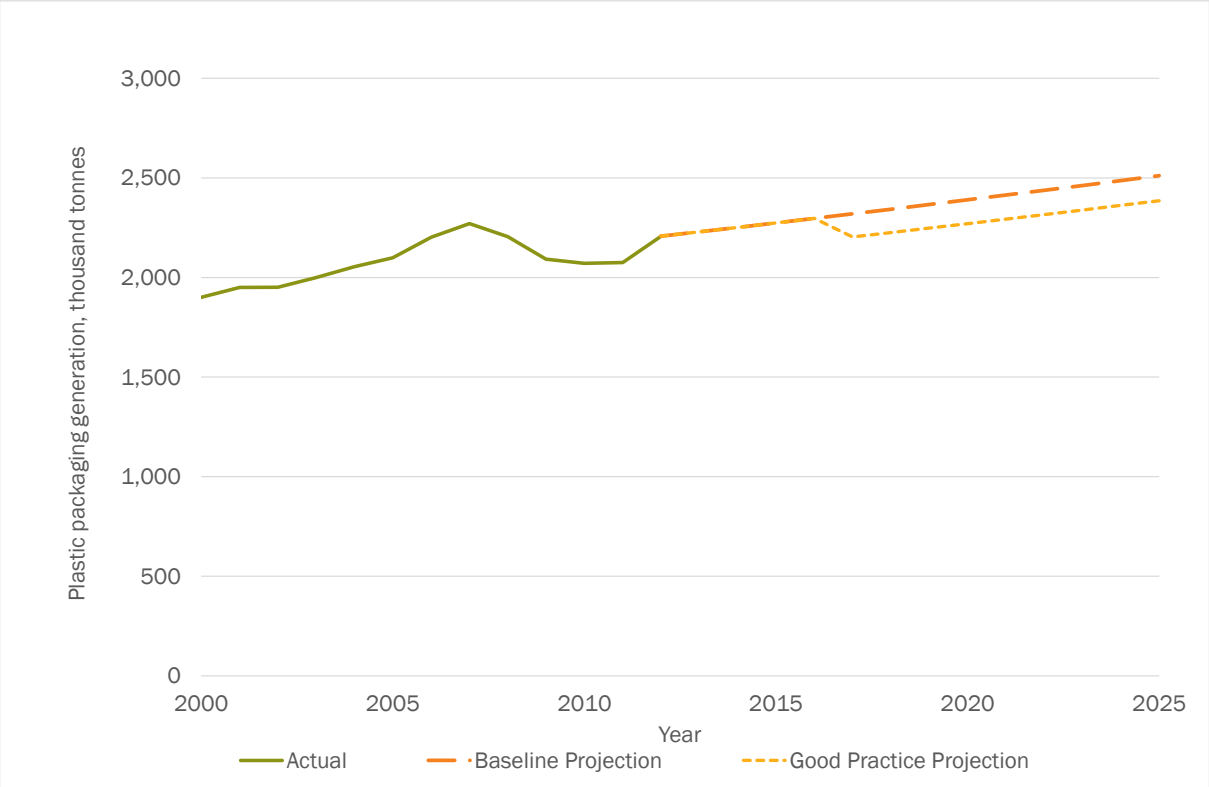


Figure 225: Change in Wood Packaging Generation, thousand tonnes

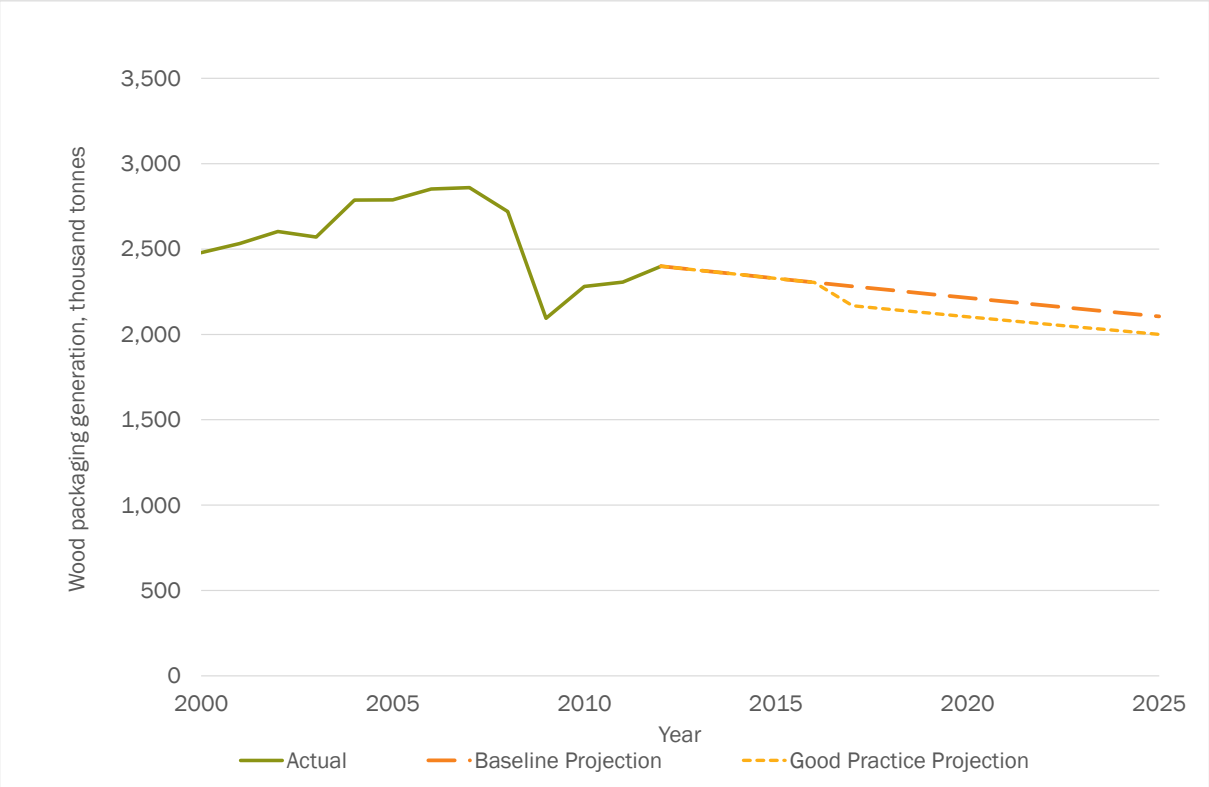


Figure 226: Change in Metal Packaging Generation, thousand tonnes

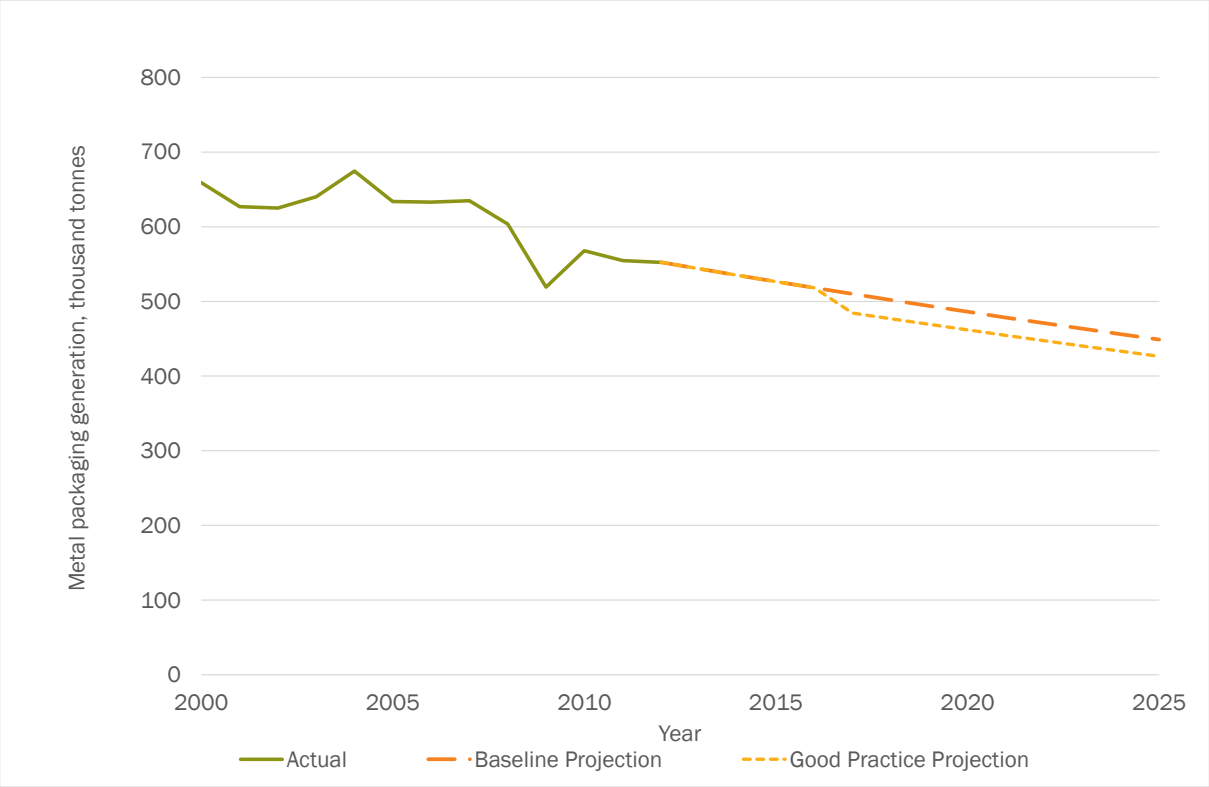


Figure 227: Change in Glass Packaging Generation, thousand tonnes

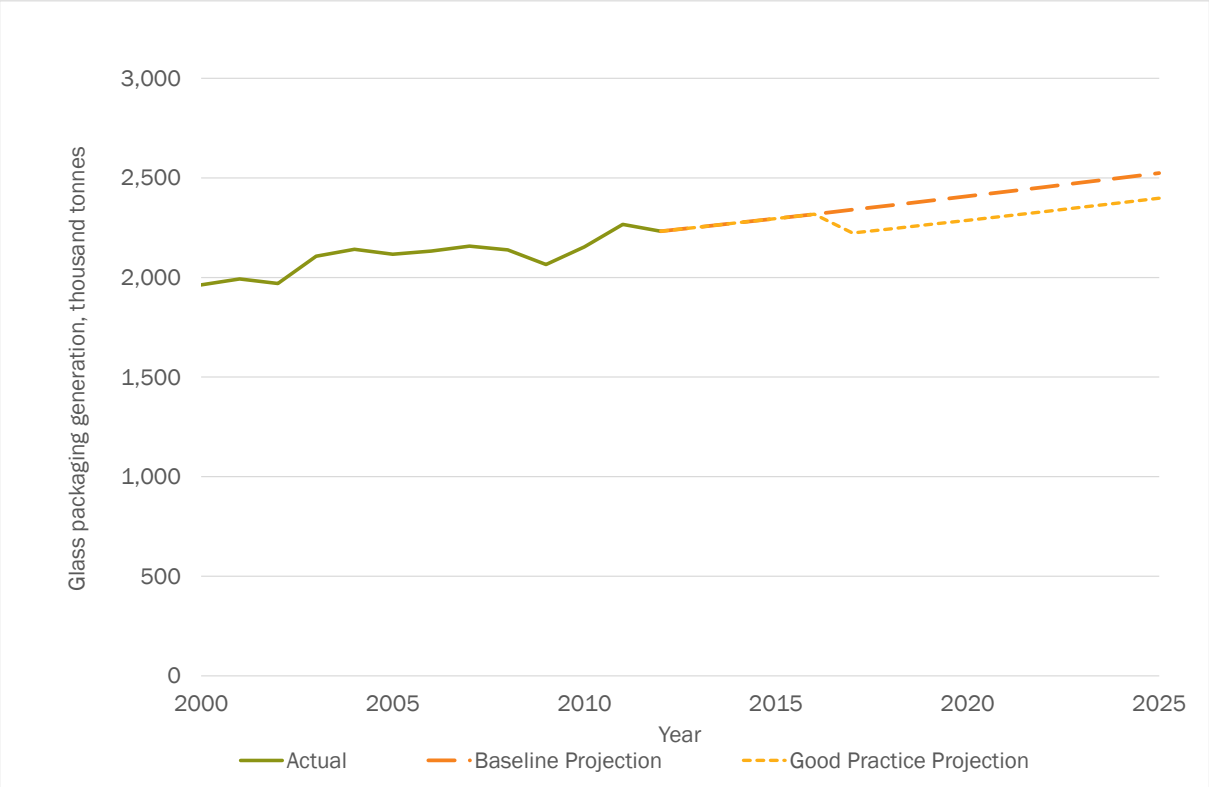
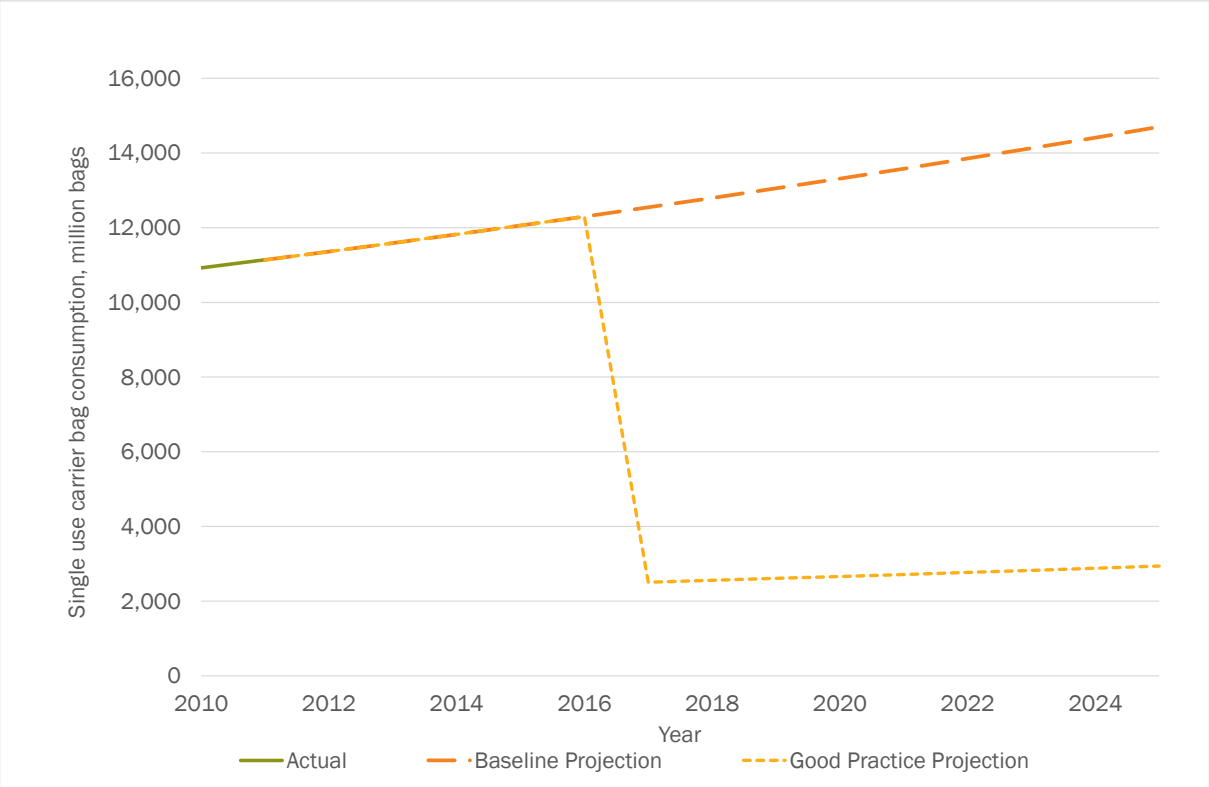


Figure 228: Change in Consumption of Single Use Carrier Bags, million bags



A.12.5 Full Revenue Outputs

Table 204: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	798	1,582	2,353	3,114	3,867	4,612	5,349	6,081	6,081	6,081
	C&I / Heating	0	0	282	556	823	1,083	1,336	1,584	1,825	2,062	2,062	2,062
	Electricity	0	2,394	2,394	2,394	2,394	2,394	2,394	2,394	2,394	2,394	2,394	2,394
	Sub-total Energy, million EUR	*0*	*2,394*	*3,474*	*4,532*	*5,570*	*6,591*	*7,596*	*8,589*	*9,569*	*10,537*	*10,537*	*10,537*
	Sub-total Energy, % GDP	*0.0%*	*0.2%*	*0.2%*	*0.3%*	*0.3%*	*0.4%*	*0.5%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Transport (excl. Transport fuels)	Vehicle Taxes	0	0	710	1,429	2,157	2,893	3,726	3,770	3,815	3,861	3,908	3,954
	Passenger Aviation Tax	0	0	1,694	3,359	3,424	3,489	3,554	3,619	3,684	3,750	3,816	3,881
	Freight Aviation Tax	0	0	0.47	0.90	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81
	Sub-total Transport, million EUR	*0*	*0*	*2,405*	*4,789*	*5,582*	*6,383*	*7,280*	*7,390*	*7,501*	*7,612*	*7,724*	*7,837*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.3%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	229	436	622	606	589	572	576	579	583	587	590
	Landfill Tax - Inerts (C&D)	0	1	2	2	2	2	1	1	1	1	1	1
	Incineration /MBT Tax	0	56	112	166	166	167	167	168	169	170	171	173
	Air Pollution Tax	0	64	116	158	193	220	199	191	183	176	169	162
	Water Abstraction Tax	0	953	1,858	2,717	3,531	4,299	4,186	4,167	4,148	4,130	4,112	4,094
	Waste Water Tax	0	102	197	285	275	275	275	275	275	275	275	275
	Pesticides Tax	0	0	545	1,068	1,044	1,049	1,053	1,057	1,061	1,066	1,070	1,074
	Aggregates Tax	0	0	819	729	642	556	472	467	462	458	453	449
	Packaging Tax	0	0	353	337	338	340	341	342	344	345	347	348
	Single Use Bag Tax												
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	*0*	*1,405*	*4,438*	*6,086*	*6,798*	*7,496*	*7,266*	*7,245*	*7,224*	*7,204*	*7,185*	*7,167*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.1%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
	Total, million EUR	0	3,799	10,317	15,407	17,949	20,469	22,143	23,224	24,293	25,353	25,446	25,540
	Total, % GDP	0.0%	0.2%	0.6%	0.9%	1.1%	1.2%	1.3%	1.4%	1.4%	1.4%	1.4%	1.4%

A.13.0 Lithuania: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

The information below is mainly from the European Commission's Tax-UD database[902] and Excise Duties Tables[903] as well as the OECD/EEA's environmental tax database[904] with some additional information from publically available sources. Currency conversions from LTL to € were calculated using Eurostat annual average exchange rates for the relevant year.[905]

A.13.1 Energy

- Excise duty on energy products:
  - Tax rates for 2013 are shown in Table 205.[906]

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[902] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[903] European Commission - Taxation and Customs Union (2013) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2013, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[904] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

[905] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

[906] European Commission (2013) *Excise Duty Tables*, Accessed 2 December 2013, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf, pp.8-64.

- In 2012 revenues from energy excise duties amounted to LTL 1.78 billion (€516 million), equivalent to 1.54% of GDP.[907,908]

Table 205: Energy Excise Duties (2013)

General tax base	Unit	Specific Tax Base	Tax rate	
			LTL	EUR
Petrol	per 1,000 litres	Leaded	2000.00	579.24
		Unleaded	1500.00	434.43
Gas oil	per 1,000 litres	Transport fuel	1140.00	330.17
		Industrial/Commercial use	1140.00	330.17
		Heating - Business use	73.00	21.14
		Heating - Non-business use	73.00	21.14
Kerosene	per 1,000 litres	Transport fuel	1,140.00	330.17
		Industrial/Commercial use	1,140.00	330.17
		Heating - Business use	1,140.00	330.17
		Heating - Non-business use	1,140.00	330.17
Heavy fuel oil	per 1,000 kg	Heating - Business use	52.00	15.06
		Heating - Non-business use	52.00	15.06
Liquid Petroleum Gas	per 1,000 kg	Transport fuel	1050.00	304.10
		Industrial/Commercial use	1050.00	304.10
		Heating - Business use	0	0
		Heating - Non-business use	0	0
Natural Gas	per GJ	Transport fuel	22.63	6.55

[907] DG TAXUD (2013) *Excise Duty Tables (Tax receipts – Energy products and Electricity)*, July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

[908] Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1

General tax base	Unit	Specific Tax Base	Tax rate	
			LTL	EUR
		Industrial/Commercial use	0	0
		Heating - Business use	0	0
		Heating - Non-business use	0	0
Coal	per GJ	Heating - Business use	0.52	0.15
		Heating - Non-business use	1.04	0.30
Coke	per GJ	Heating - Business use	0.52	0.15
		Heating - Non-business use	1.04	0.30
Lignite	per GJ	Heating - Business use	0.52	0.15
		Heating - Non-business use	1.04	0.30
Electricity	per MWh	Business use	1.80	0.52
		Non-business use	3.50	1.01

A.13.2 Transport (excl. transport fuels)

- Registration tax:
  - Vehicle import duty: Levies vehicles between 7 to 10 years old by 5% of their customs value, and vehicles greater than 10 years old by 10% to 20% of their customs value.[909] These rates were taken from the OECD database and relate to 2009. Efforts were made to identify updated rates, but these could not be identified.
- Circulation tax on heavy vehicles:
  - The annual tax rates for 2009 are shown in Table 206.[910] As above, efforts were made to identify updated figures, but none could be obtained.

[909] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

[910] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

Table 206: Heavy Vehicles Tax (2009)

Tax base	Tax rate (per year)	
	LTL	EUR
Combination vehicles with total weight 40 - 41 tonnes (axle with pneumatic suspension)	2243.3736	649.7259
Combination vehicles with total weight 40 - 41 tonnes (other type of suspension)	2570.9459	744.5974
Combination vehicles with total weight 41 - 42 tonnes (axle with pneumatic suspension)	2243.3736	649.7259
Combination vehicles with total weight 41 - 42 tonnes (other type of suspension)	2580.8724	747.4723
Combination vehicles with total weight 42 - 43 tonnes (axle with pneumatic suspension)	2243.3736	649.7259
Combination vehicles with total weight 42 - 43 tonnes (other type of suspension)	173.8385	50.3471
Combination vehicles with total weight 43 - 44 tonnes (axle with pneumatic suspension)	2243.3736	649.7259
Combination vehicles with total weight 43 - 44 tonnes (other type of suspension)	2600.7249	753.2220
Vehicles with total weight 12 - 13 tonnes (axle with pneumatic suspension)	297.7930	86.2468
Vehicles with total weight 12 - 13 tonnes (other type of suspension)	342.4618	99.1838
Vehicles with total weight 13 - 14 tonnes (axle with pneumatic suspension)	297.7930	86.2468
Vehicles with total weight 13 - 14 tonnes (other type of suspension)	347.4252	100.6213
Vehicles with total weight 14 - 15 tonnes (axle with pneumatic suspension)	297.7930	86.2468
Vehicles with total weight 14 - 15 tonnes (other type of suspension)	352.3883	102.0587
Vehicles with total weight 15 - 16 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 15 - 16 tonnes (other type of suspension)	595.5859	172.4936
Vehicles with total weight 16 - 17 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 16 - 17 tonnes (other type of suspension)	605.5124	175.3685
Vehicles with total weight 17 - 18 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 17 - 18 tonnes (other type of suspension)	615.4388	178.2434
Vehicles with total weight 18 - 19 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 18 - 19 tonnes (other type of suspension)	625.3653	181.1183
Vehicles with total weight 19 - 20 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 19 - 20 tonnes (other type of suspension)	635.2917	183.9932

Tax base	Tax rate (per year)	
	LTL	EUR
Vehicles with total weight 20 - 21 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 20 - 21 tonnes (other type of suspension)	645.2182	186.8681
Vehicles with total weight 21 - 22 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 21 - 22 tonnes (other type of suspension)	655.1446	189.7430
Vehicles with total weight 22 - 23 tonnes (axle with pneumatic suspension)	436.7630	126.4953
Vehicles with total weight 22 - 23 tonnes (other type of suspension)	665.0707	192.6178
Vehicles with total weight 23 - 24 tonnes (axle with pneumatic suspension)	813.9672	235.7412
Vehicles with total weight 23 - 24 tonnes (other type of suspension)	952.9376	275.9898
Vehicles with total weight 24 - 25 tonnes (axle with pneumatic suspension)	813.9672	235.7412
Vehicles with total weight 24 - 25 tonnes (other type of suspension)	962.8637	278.8646
Vehicles with total weight 25 - 26 tonnes (axle with pneumatic suspension)	813.9672	235.7412
Vehicles with total weight 25 - 26 tonnes (other type of suspension)	972.7901	281.7395
Vehicles with total weight 26 - 27 tonnes (axle with pneumatic suspension)	813.9672	235.7412
Vehicles with total weight 26 - 27 tonnes (other type of suspension)	982.7166	284.6144
Vehicles with total weight 27 - 28 tonnes (axle with pneumatic suspension)	813.9672	235.7412
Vehicles with total weight 27 - 28 tonnes (other type of suspension)	992.6431	287.4893
Vehicles with total weight 28 - 29 tonnes (axle with pneumatic suspension)	813.9672	235.7412
Vehicles with total weight 28 - 29 tonnes (other type of suspension)	1995.2126	577.8535
Vehicles with total weight 29 - 30 tonnes (axle with pneumatic suspension)	1290.4360	373.7361
Vehicles with total weight 29 - 30 tonnes (other type of suspension)	1479.0383	428.3591
Vehicles with total weight 30 - 31 tonnes (axle with pneumatic suspension)	1290.4360	373.7361
Vehicles with total weight 30 - 31 tonnes (other type of suspension)	1488.9648	431.2340
Vehicles with total weight 31 - 32 tonnes (axle with pneumatic suspension)	1290.4360	373.7361
Vehicles with total weight 31 - 32 tonnes (other type of suspension)	1498.8912	434.1089
Vehicles with total weight 32 - 33 tonnes (axle with pneumatic suspension)	1290.4360	373.7361

Tax base	Tax rate (per year)	
	LTL	EUR
Vehicles with total weight 32 - 33 tonnes (other type of suspension)	1508.8177	436.9838
Vehicles with total weight 33 - 34 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 33 - 34 tonnes (other type of suspension)	2044.8448	592.2280
Vehicles with total weight 34 - 35 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 34 - 35 tonnes (other type of suspension)	2054.7713	595.1029
Vehicles with total weight 35 - 36 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 35 - 36 tonnes (other type of suspension)	2064.6977	597.9778
Vehicles with total weight 36 - 37 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 36 - 37 tonnes (other type of suspension)	2074.6242	600.8527
Vehicles with total weight 37 - 38 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 37 - 38 tonnes (other type of suspension)	2084.5507	603.7276
Vehicles with total weight 38 - 39 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 38 - 39 tonnes (other type of suspension)	2094.4771	606.6025
Vehicles with total weight 39 - 40 tonnes (axle with pneumatic suspension)	1836.3900	531.8553
Vehicles with total weight 39 - 40 tonnes (other type of suspension)	2104.4036	609.4774

A.13.3 Pollution and Resources

- Tax on Pollution:
  - Lithuania taxes emissions to water, soil, and air from stationary sources of pollution. From mobile sources of pollution there are taxes only on emissions to air. In addition, there are taxes on packaging and other harmful products. These taxes are set out in the Law on Pollution Charges. The last amendments of the tax rates are as follows:
    - On water, soil, and air emissions from stationary sources the tax rates were last updated in January 2010;
    - On air pollution from mobile sources in June 2009; and
    - On packaging and other products in January 2012.

- Taxes on emission to water, soil, and air from stationary sources are paid by natural and legal persons who have to have integrated pollution prevention and control permits (these permit stipulate the rates of emissions into the environment).
- Separate tax rates are set on the main 'conventional' pollutants (BOD, P, N, SO_2, and NO_X), while the rest are aggregated into specific pollutant groups based on their hazardousness (based on five categories – see tables below). Usually a basic charge rate is applied for emissions within allowable limits and concentrations, whereas a non – compliance fee is levied for a breach of the limits. Tax rates set on pollutants discharged depend on the harmfulness of pollutants discharged. Fines are imposed for unlawful discharges, distortion of emission data or for undeclared pollution.
- Tax rates are indexed by the tax payer in accordance with the consumer price index of the fiscal year, published by Lithuania's Department of Statistics.
- The pollution tax with an increased tax rate shall be applied in cases where stationary sources have exceeded their allocated emissions quota or falsified their emissions data. Where this is the case, the pollution tax with an increased rate shall is calculated by:
    - Multiplying the amount of air and water pollutants discharged (tonnes) from a stationary source of pollution which has exceeding the set standard and/or concealed their actual emission level, by the pollution tax rate for polluting from stationary sources of pollution (see Table 207 and Table 209), multiplied by the coefficient of the pollution tax rate for polluting from stationary sources of pollution (see Table 208 and Table 210).

  This calculation method also applies to mobile sources of pollution, but in these instances only emissions to air are taken into account. The tax rates on air pollutants for mobile facilities are summarised in Table 211 and the coefficients by which these rates are multiplied for non-compliant facilities is shown in Table 212. [911]
- Revenue from pollution taxes was €17 million in 2012 (equivalent to 0.0005% of GDP).[912]

[911] Republic of Lithuania (2008) *Law on Pollution Tax*, 13 May 1999 No VIII-1183 Vilnius, Accessed 20th January 2014, http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_e?p_id=315265

[912] European Commission (2013) *"Taxes in Europe Database" Lithuania, Tax On Pollution*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 207: Tax Rates for Pollutants Emitted into the Atmosphere from Stationary Sources (2009)

Pollutant	Tax Rate (per tonne)	
	LTL	EUR
SO_2	360	104
NO_x	680	197
Vanadium pentoxide	13,311	3,855
Solid particles (organic and inorganic)	213	62
Groups of Pollutants		
I	1,402	406
II	661	191
III	86	25
IV	15	4

Table 208: Coefficients of Pollution Tax Rates for Atmospheric Pollution from Stationary Sources (2009)

Pollutant	Coefficient
SO_2	1.5
NO_x	1.5
Vanadium pentoxide	300
Solid particles (organic and inorganic)	1.5
Groups of Pollutants	
I	300
II	50
III	30
IV	1.5

Table 209: Pollutants Discharged into the Waters, Ground and Deeper Layers of the Ground (2009)

Pollutant	Tax Rate (per tonne)	
	LTL	EUR
BDS_7	887	257
Total nitrogen	695	201
Total phosphorus	3,477	1,007
Suspended materials	358	1,007
Sulphates	2	0.58
Chlorides	10	3
Groups of Pollutants		
I	10,083,833	2,920,480
II	918,751	266,089
III	149,801	43,385
IV	33,947	9,832
V	3,328	967

Table 210: Coefficients of Pollution Tax Rates for Pollutants Discharged into the Waters, Ground and Deeper Layers of the Ground (2009)

Pollutant	Coefficient
BDS_7	10
Total nitrogen	5
Total phosphorus	10
Suspended materials	1.5
Sulphates	1.5
Chlorides	1.5
Groups of Pollutants	
I	100
II	50
III	10
IV	5
V	2

- The pollution tax for polluting the environment from mobile sources of pollution is paid by natural and legal persons who operate vehicles, vessels, trains, and airplanes for economic and commercial activities. Tax rates are banded according to the mode of transport and the type of fuel used – the tax rates are presented in Table 211.
- Tax rates are indexed by the tax payer in accordance with the consumer price index of the fiscal year as defined by Lithuania's Department of Statistics. This ensures that the tax rates remain constant in real terms.
- Where operators of 'mobile sources of pollution' conceal or falsify their records they are liable to pay the tax multiplied by a specific coefficient which relates to the mode of transport and the fuel used. These coefficients are defined in Table 212.

Table 211: Pollution Tax Rates for Pollution from Mobile Sources of Pollution (2009)

Transport Vehicles	Type of Fuel or Cycle	Tax Rate (per tonne)	
		LTL	EUR
Motor vehicles with internal combustion engines	Petrol	27	8
	Diesel	28	8
	Liquefied petroleum gas	26	8
	Compressed natural gas	21	8
Vessels	Petrol	41	12
	Diesel	44	13
	Fuel oil with sulphur content of 0.5%	10	3
	Fuel oil with a sulphur content between 0.5% and 1.5%	18	5
	Fuel oil with a sulphur content between 1.5% and 2.5%	26	8
Rail transport	Diesel	33	10
Take-off/landing cycle of aircrafts	For one cycle	6	2

Table 212: Coefficients of Pollution Tax Rates for Pollution from Mobile Sources (2012)

Transport Vehicles	Type of Fuel or Cycle	Coefficient
Motor vehicles with internal combustion engines	Petrol	1.5
	Diesel	6
	Liquefied petroleum gas	1.5
	Compressed natural gas	1.5
Vessels	Petrol	2
	Diesel	6
	Fuel oil with sulphur content 0.5%	2
	Fuel oil with sulphur content from 0.5% to 1.5%	3
	Fuel oil with sulphur content from 1.5% to 2.5%	3
Rail transport	Diesel	4
Take-off/landing cycle of aircrafts	For one cycle	4

- Lithuania also charges a tax on goods and packaging materials which are paid by manufactures and importers who place specific goods on the internal market. Where companies are found to be falsifying their data they are liable to pay an increased rate of tax which is calculated by multiplying the concealed/misreported amount of taxable goods and/or taxable packaging by the tax rate specified in the Law (see Table 213 and Table 214) and a coefficient equal to 2 (i.e. they are liable to pay double the rate of tax on any quantity of material that is discovered to have been unreported via official channels).
- Manufacturers and importers are exempted from paying the packaging and goods tax under the following circumstance:
  - For goods and/or packaging waste if they fulfil the task related to recovery and/or recycling of goods and packaging waste set by the Government and, pursuant to the procedure established by the Government or an institution authorised by it, submit the documents certifying the amount of goods or packaging waste reused, recycled or used for energy recovery;
  - For goods and/or packaging if they export goods / or filled packaging companies are exempted for exported amount of goods / or filled packaging; and
  - For packaging waste if they placed on the internal market of the Republic of Lithuania no more than 500 kg of filled packaging per year.

Table 213: Tax Rates for Pollution from Goods (2012)

Goods	Tax Rate (per kg)	
	LTL	EUR
Tyres weighing over 3 kg:		
a) New	0.30	0.09
b) Re-treaded	0.36	0.10
c) Used	0.50	0.15
Accumulators	0.50	0.15
Voltaic cells	10.00	2.90
Oil or petrol filters for internal combustion engines	1.60	0.46
Intake air filters for internal combustion engines	1.60	0.46
Hydraulic shock-absorbers for motor vehicles	1.20	0.35

Table 214: Tax Rates for Pollution from Packaging Waste (2012)[913]

Packaging Types	Tax Rate (per kg)	
	LTL	EUR
Glass packaging	0.20	0.058
Plastic packaging	1.80	0.521
Composite packaging	2.00	0.579
Metal packaging	2.60	0.579
Paper and carton packaging	0.10	0.029
Other packaging	0.20	0.058

- Lithuania's tax rates on natural resource extraction are set out in the Law of Natural Resource Tax. The last amendments to this Law came into force on the 1st January 2012:
  - The tax rates for different materials are shown in Table 215.[914] These tax rates were set in the relevant legislation in 2009 and are indexed to an inflationary measure to ensure that they remain constant in real terms). These taxes on natural resources raised €19 million in 2012 (equivalent to 0.0006% of GDP).[915]

[913] See Appendix 3, Republic of Lithuania (2008) *Law on Pollution Tax*, 13 May 1999 No VIII-1183 Vilnius, Accessed 20th January 2014, http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_e?p_id=315265

[914] Seimas of the Republic of Lithuania (2012) *Law of Natural Resource Tax*, Actual version of the Law on 1st January 2012, Annex 1, Accessed 21st January 2014, www3.lrs.lt/pls/inter2/dokpaieska.showdoc_l?p_id=416294

[915] European Commission (2013) *"Taxes in Europe Database" Lithuania, Tax on State Natural Resources*, Accessed 2th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 215: Taxes on Natural Resources (2009)

Resource	Unit	Tax Rate (per m³)	
		LTL	EUR
Anhydrite	per m³	5.00	1.45
Dolomite	per m³	2.50	0.72
Peat	per m³	2.00	0.58
Amber	per kg	69.80	20.22
Limestone	per m³	2.09	0.61
Chalk marl	per m³	2.26	0.65
Clay: a) Devon b) b) Triassic c) c) Other	per m³	 2.16 2.09 1.28	 0.63 0.61 0.37
Marl	per m³	1.80	0.52
Sapropel	per m³	0.85	0.25
Sand clay liesinti	per m³	1.20	0.35
Sand for glass manufacture	per m³	4.00	1.16
Silicate sand boxes	per m³	1.10	0.32
Next sand	per m³	0.95	0.28
Gravel	per m³	1.12	0.32

- Tax on petroleum and natural gas extraction:
  - The tax rates on oil and gas extraction are set in the Law on Tax on Petroleum and Natural Gas Resources (the last amendments came in to force in June of 2012). The main point of the amendment was to remove the tax allowances applied to oil and gas extracting companies in order to compensate the State for the exploration costs. The amended legislation provides for a more flexible taxation scheme, which differentiates tax tariffs (ranging from 2% to 20 % of the sales price) depending on the location of the oil and gas deposit and the

extracting capacity from each well (see Table 216 for detail on the tax rates).[916]

- This tax generated revenue of €10 million in 2012 (this equates to 0.0003% of GDP). [917]

Table 216: Base Rates of Tax on Petroleum and Natural Gas Resources (2012)

Extraction from the Deposit per year (1,000 tonnes)	Base Rate of Tax (% of sales price)
Inland deposits	
up to 1	2%
1–5	6%
5–10	8%
10–15	10%
15–20	12%
20–25	16%
over 25	20%
Deep sea deposits	
up to 100	2%
100–200	4%
200–300	6%
300–400	8%
400–500	10%
500–600	12%
600–700	14%
over 700	16%

➢ Forest felling charges:

[916] Seimas of the Republic of Lithuania (2003) *Law on Amending Law on Tax on Petroleum and Natural Gas Resources*, Accessed 21st January 2014, www3.lrs.lt/pls/inter3/dokpaieska.showdoc_e?p_id=264069&p_tr2=2

[917] European Commission (2013) *Taxes in Europe Database: Lithuania, Tax on Petroleum and Natural Gas Resources*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Forest felling charges tax 5% of the income derived from round-wood and stumpage sales in Lithuania (2009 rate).[918]

- Nature protection non-compliance fee:
  - This focuses on the damage to done to species and/or their habits. It is based on the level of damage done. A tree cutting non-compliance fee is also in place which levies illegal tree-cutting at 3 to 10 times the stumpage fee.[919]
- Waste disposal non-compliance fee:
  - This fee levies differentiating amounts based on the type of non-compliance. These range from €212 to €21,217 per case (2009 rates).[920]
- Water abstraction charges:
  - Water abstraction charges in Lithuania are charged per cubic metre and vary depending on the end use. The prices set in national legislation in 2009 are summarised in Table 217.[921] These prices increase with inflation and are therefore intended to remain constant in real terms.

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[918] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

[919] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

[920] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

[921] Republic of Lithuania (2012) *Law on State Natural Resources*, Actual version of the Law on 1st January 2012, Annex 2, Accessed 21st January 2014, www3.lrs.lt/pls/inter2/dokpaieska.showdoc_l?p_id=416294

Table 217: Water Abstraction Charges (2009)

End Use	Tax Rate (per m³)	
	LTL	EUR
Groundwater, with exception of mineral water:		
d) Provided by water supplier for household use and heating	0.06	0.02
e) Used by legal entities for commercial purposes, put up in a container	10.8	3.12
f) Other (not specified in a and b) groundwater	0.24	0.069
Mineral water, with exception of mineral water used in medical institutions	10.8	3.12
Mineral water used in medical institutions	5.4	1.6
Surface water used for industry and agriculture	0.007	0.002
Surface water used for cooling of thermal power plants	0.0007	0.0002
Surface water for fishery sector	0.0005	0.0001
Surface water hydropower	0.00003	0.000008
Surface water nuclear power plant	0.001	0.00028
Building Primer	0.64	0.19

- Water supply user charges:
  - These range from €0.37 to €0.46 per m³ for domestic users and €0.36 to €0.56 per m³ for other users (2009 rates).[922]
  - Charge rates differ from one municipality to another depending on service provider and category of water user.
- Tax on hunting areas:
  - A tax on different hunting areas is charged depending on where the most sought after animals live and breed. These tax rates are summarised in Table

[922] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 2nd December 2013, www2.oecd.org/ecoinst/queries/index.htm

218 and increase annually with inflation so as to remain constant in real terms.[923]

Table 218: Annual Tax Rate Applied to Different Hunting Areas (2009)

Characteristic	Tax Rate (per ha)	
	LTL	EUR
Deciduous and mixed deciduous and coniferous stands (coniferous - up to 50%)	1.8	0.52
Mixed coniferous and deciduous woods (hardwood - from 25% to 50%)	1.2	0.35
Mixed coniferous and deciduous forest stands a small (hardwoods from 11% to 24%)	0.9	0.26
Pure pine with less than 10% of other species impurity	0.45	0.13
Fields (agricultural land and scrub) Marijampoles county	0.3	0.09
Fields (agricultural land and scrub) in another part of the Republic of Lithuania	0.25	0.07
Bodies of water	0.1	0.03

[923] Republic of Lithuania (2012) *Mokesčio Už Valstybinius Gamtos Išteklius Į S T A T Y M A S*, Actual version of the Law on 1st January 2012, Annex 3, Accessed 21st January 2014, www3.lrs.lt/pls/inter2/dokpaieska.showdoc_l?p_id=416294

A.13.4 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 14.2.2, we list here a complete list of subsidies identified in Lithuania by the IEEP and by IVM for which financial information is not available:

Table 219: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
Reduced VAT for heat energy in the residential sector	IEEP	reduced VAT 9% (standard rate 21% VAT)
Exemption for natural gas used as motor fuel in local regular buses	TAXUD	
Exemption of Natural Resources Tax for Peat for Purpose of Treatment	IVM	Peat extraction is subject to a natural resource tax. However, if peat is extracted and used for purpose of treatment in any type of health facilities and sanatoriums, it is not taxable at all.
Reduced Rate of Excise Tax for Fuel Oil	IVM	Fuel oil that corresponds to certain criteria set by the Government or its authorized institution is taxed by the excise tax at a rate of LTL 52 (€15.06) per 1000 litres.

Sources: See Table 6 in IEEP (2013) Steps to Greening Country Report: Lithuania, Report for the European Commission, p.10.

IVM Institute for Environmental Studies (2013) Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries, Final Report, 15 January 2013, pp.38-40. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 173.

Table 220: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (LTL million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for gas oil used in agriculture and fisheries	TAXUD and IVM	Gas Oil - Other Sectors - Agricultural/Forestry & Fishing	41	1000t	49,398	1000l	330.17	0	56.3
Excise tax exemption for motor spirit used in shipping	IVM	Motor Spirit - Transport - Domestic Navigation	1	1000t	1,333	1000l	434.43	0	2.0
Excise tax exemption for kerosene used in shipping	IVM	Kerosenes, jet fuels - Transport - Domestic Navigation	1	1000t	1,235	1000l	330.17	0	1.4
Excise tax exemption for gas oil used in shipping	IVM	Gas Oil - Transport - Domestic Navigation	11	1000t	13,253	1000l	330.17	0	15.1

Sources: Source: Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

IVM Institute for Environmental Studies (2013) Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries, Final Report, 15 January 2013, pp.38-40. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

Eurostat (2013) *Energy Balance Sheets 2010-11,* 2013, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EN-13-001/EN/KS-EN-13-001-EN.PDF

A.13.5 Change in Tax Bases

Table 221: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	999	970	-29
Petrol	million litres	263	263	0
Kerosene	million litres	54	54	0
LPG	thousand tonnes	128	115	-14
Heavy Fuel Oil	thousand tonnes	10	9	0
Natural Gas	TJ (GCV)	791	710	-81
Coal	thousand tonnes	282	255	-27
Electricity	GWh	7,013	7,007	-6

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[924] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[924] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 229: Change in Intra-EU Passenger Flights, flights per year

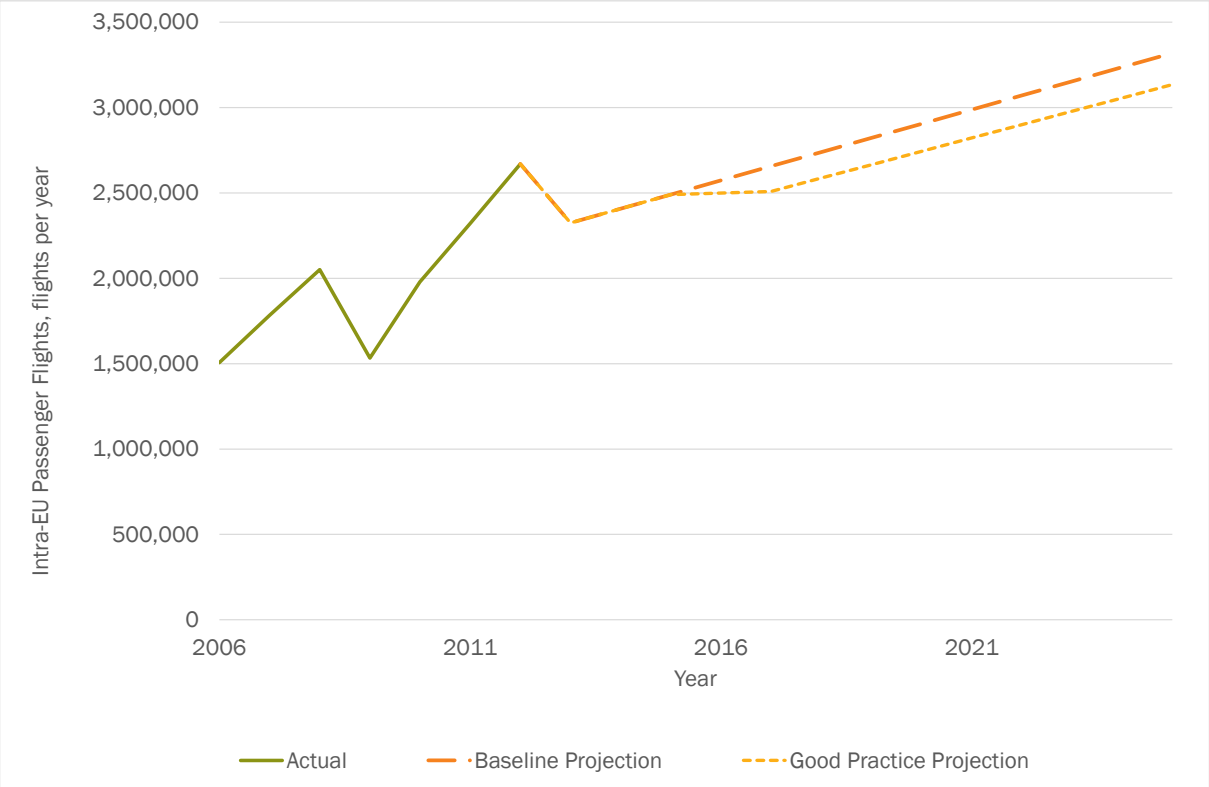


Figure 230: Change in Extra-EU Passenger Flights, flights per year

Figure 231: Change in Internal Air-freight, tonnes

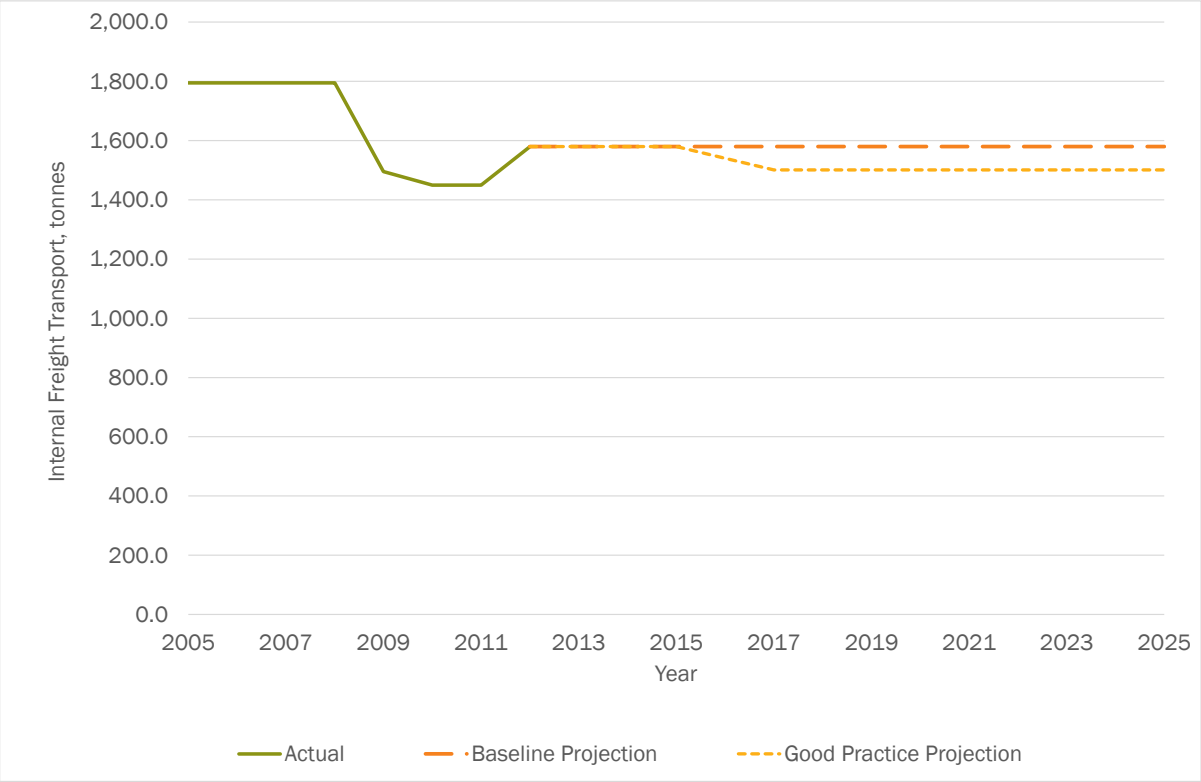


Figure 232: Change in Intra-EU Air-freight, tonnes

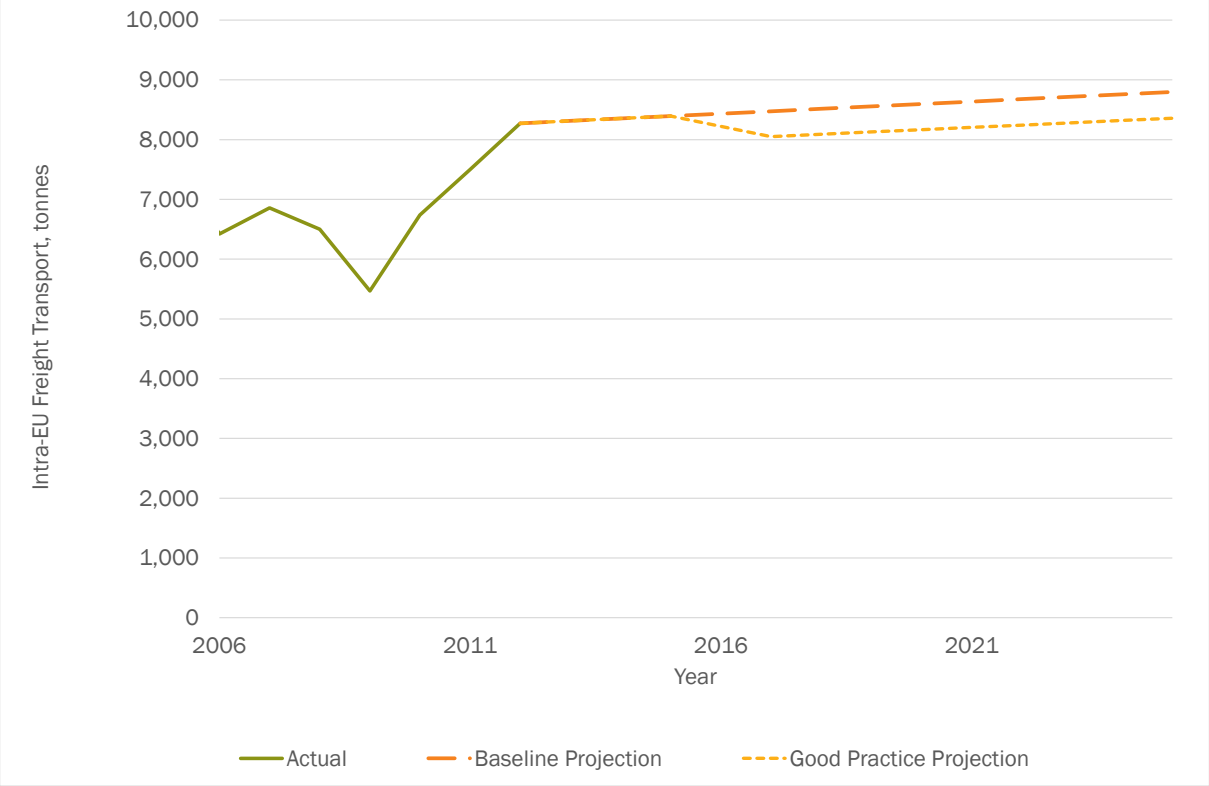


Figure 233: Change in Extra-EU Air-freight, tonnes

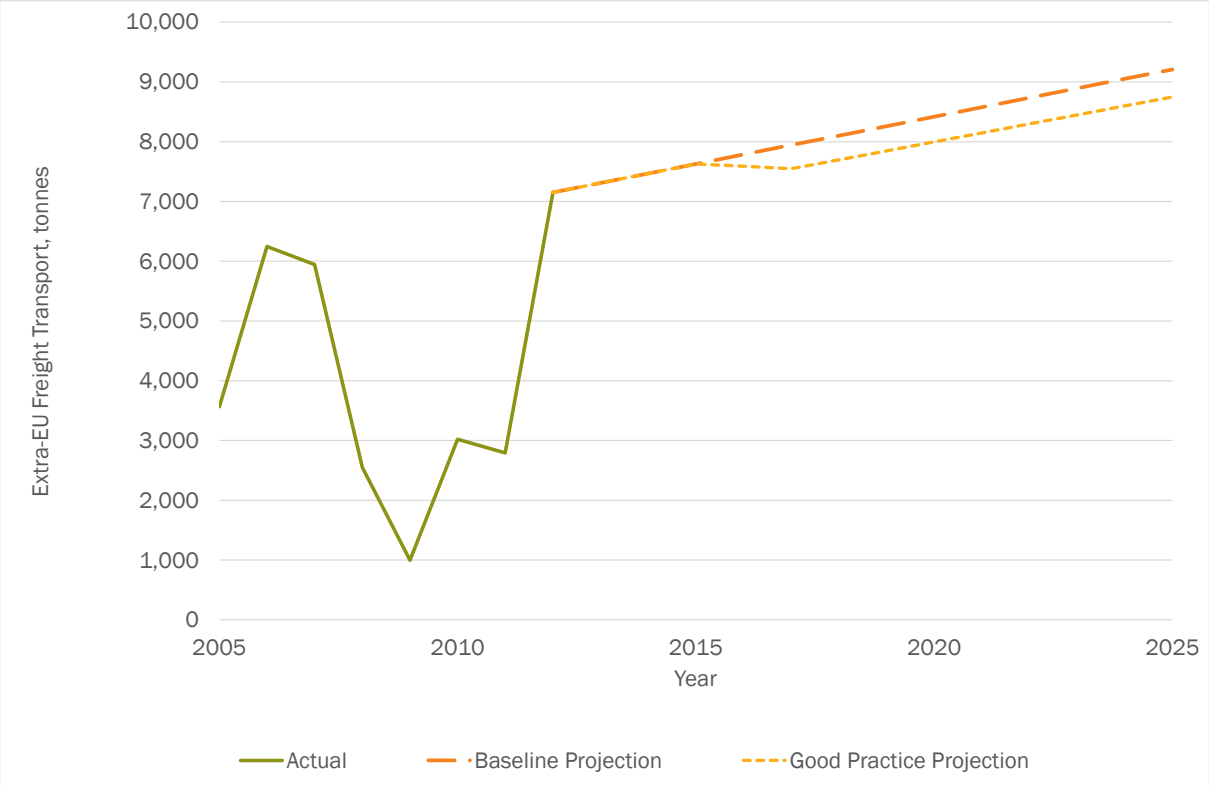


Figure 234: Change in Non-Hazardous Waste Landfilled, thousand tonnes

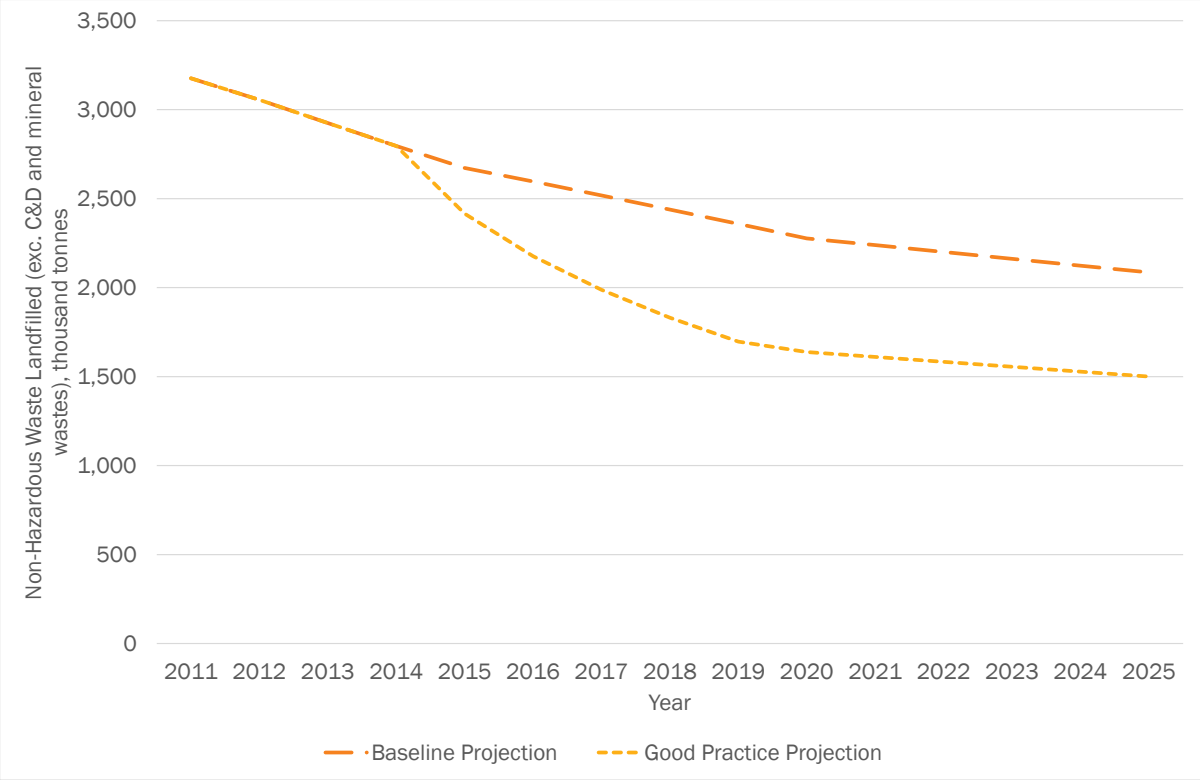


Figure 235: Change in MBT/ Incineration, thousand tonnes

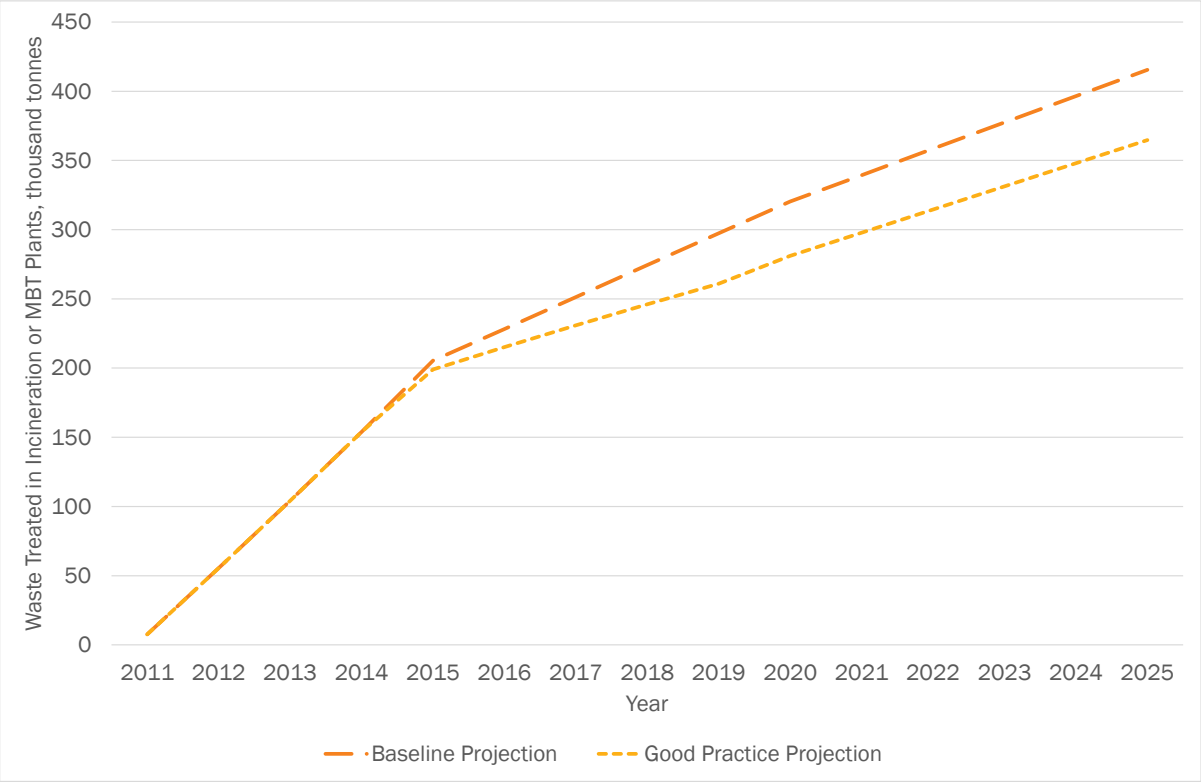


Figure 236: Change in SOx Emissions, tonnes

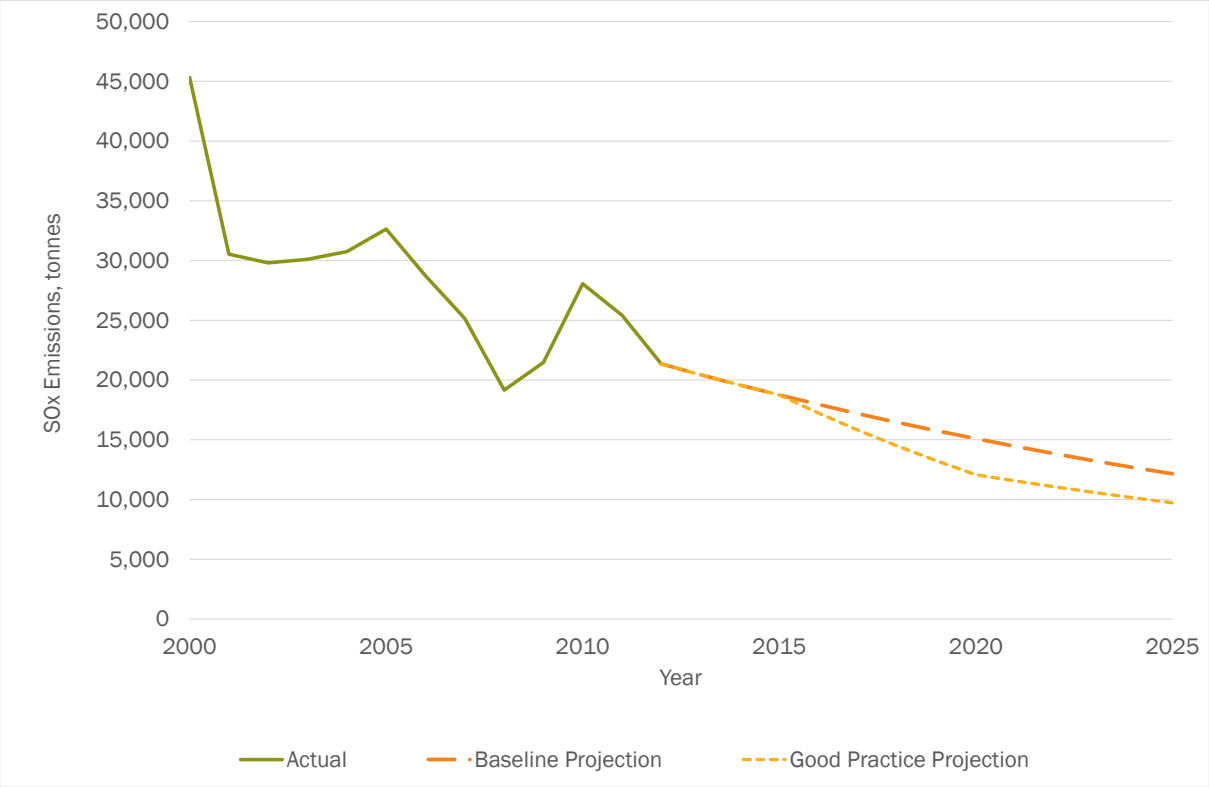


Figure 237: Change in NOx Emissions, tonnes

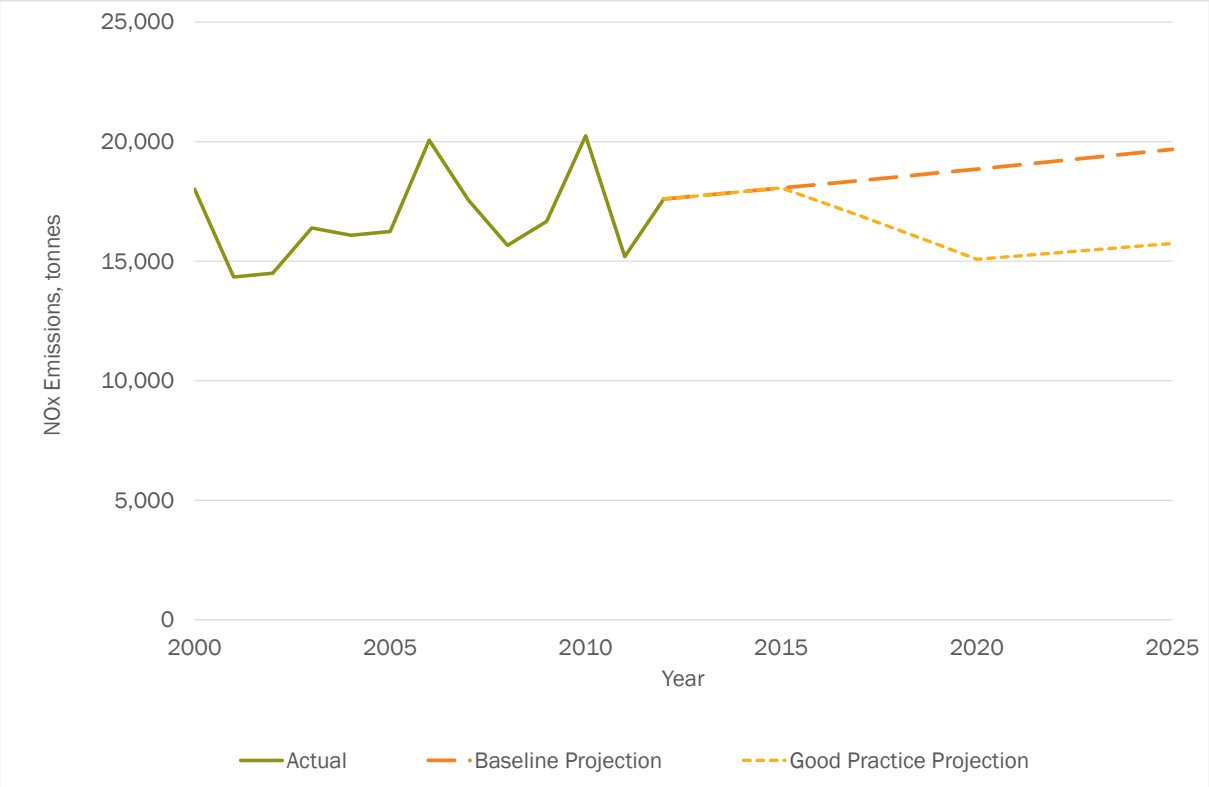


Figure 238: Change in PM_{10} Emissions, tonnes

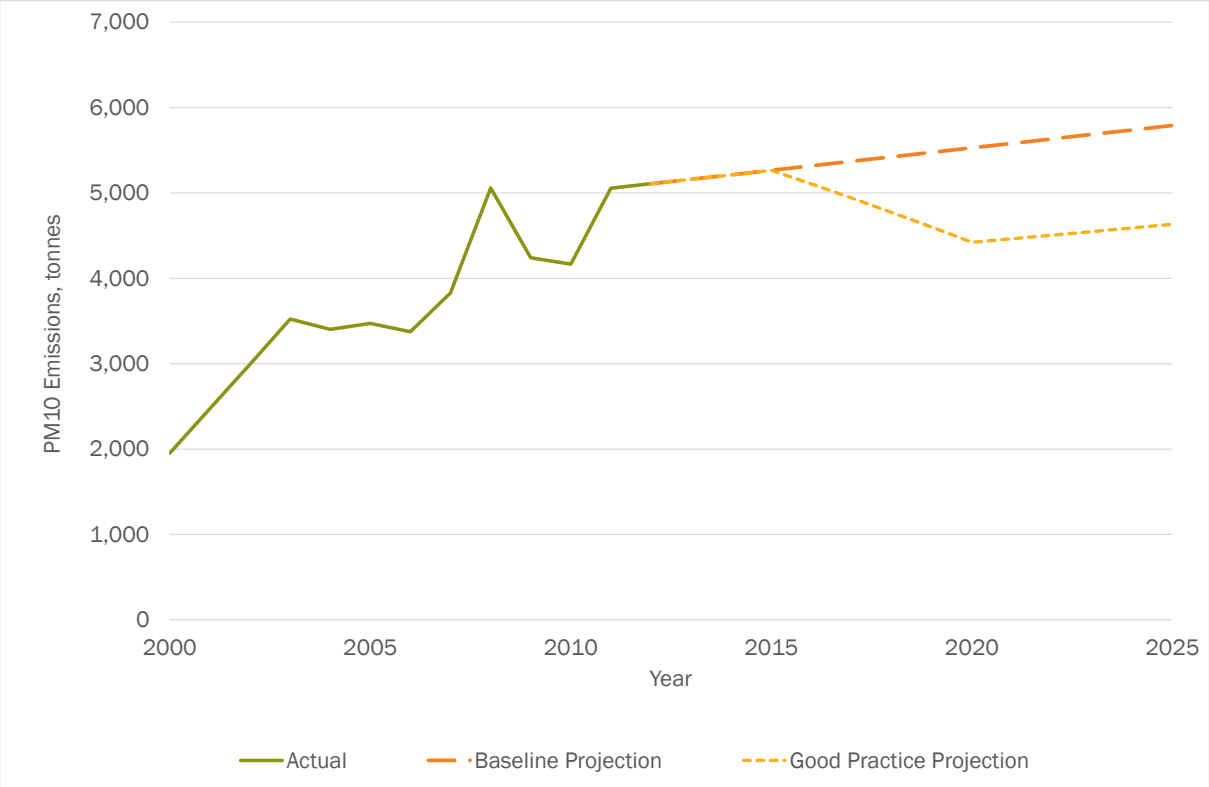


Figure 239: Change in Groundwater Abstraction – Public Supply, million cubic metres

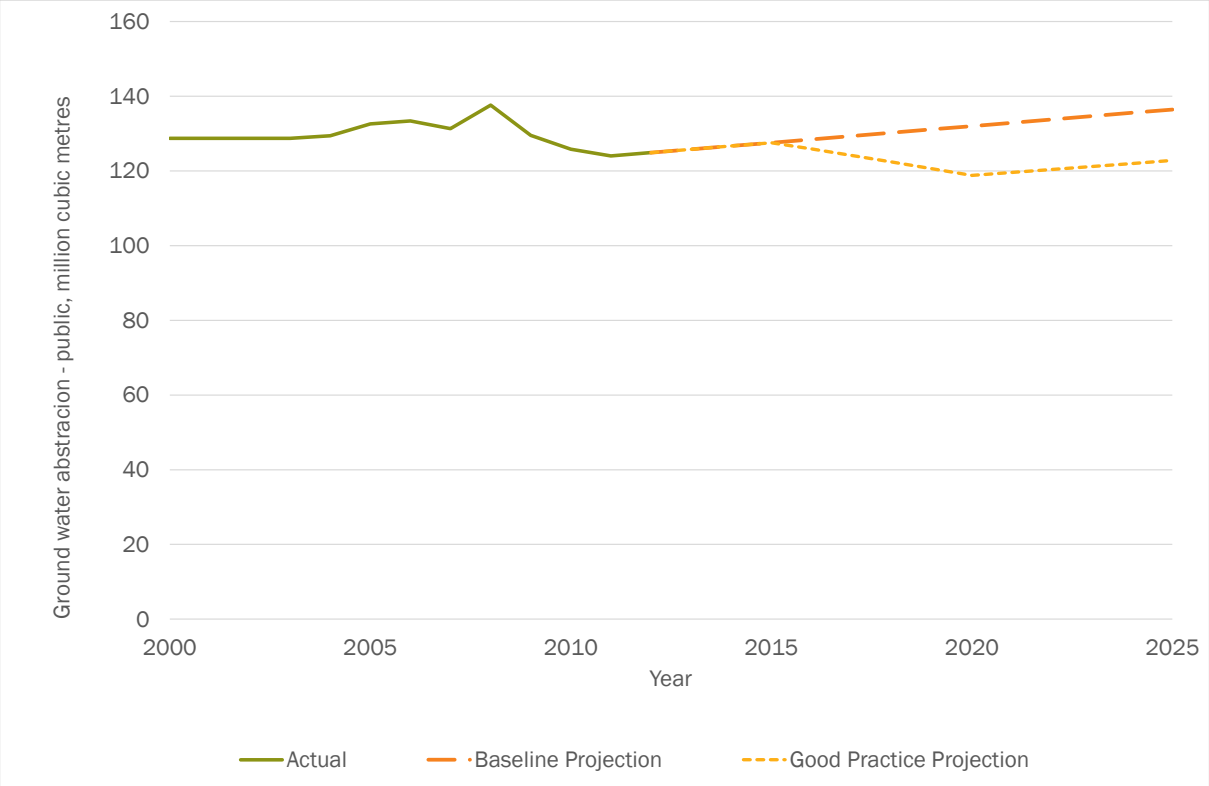


Figure 240: Change in Groundwater Abstraction – Manufacturing, million cubic metres

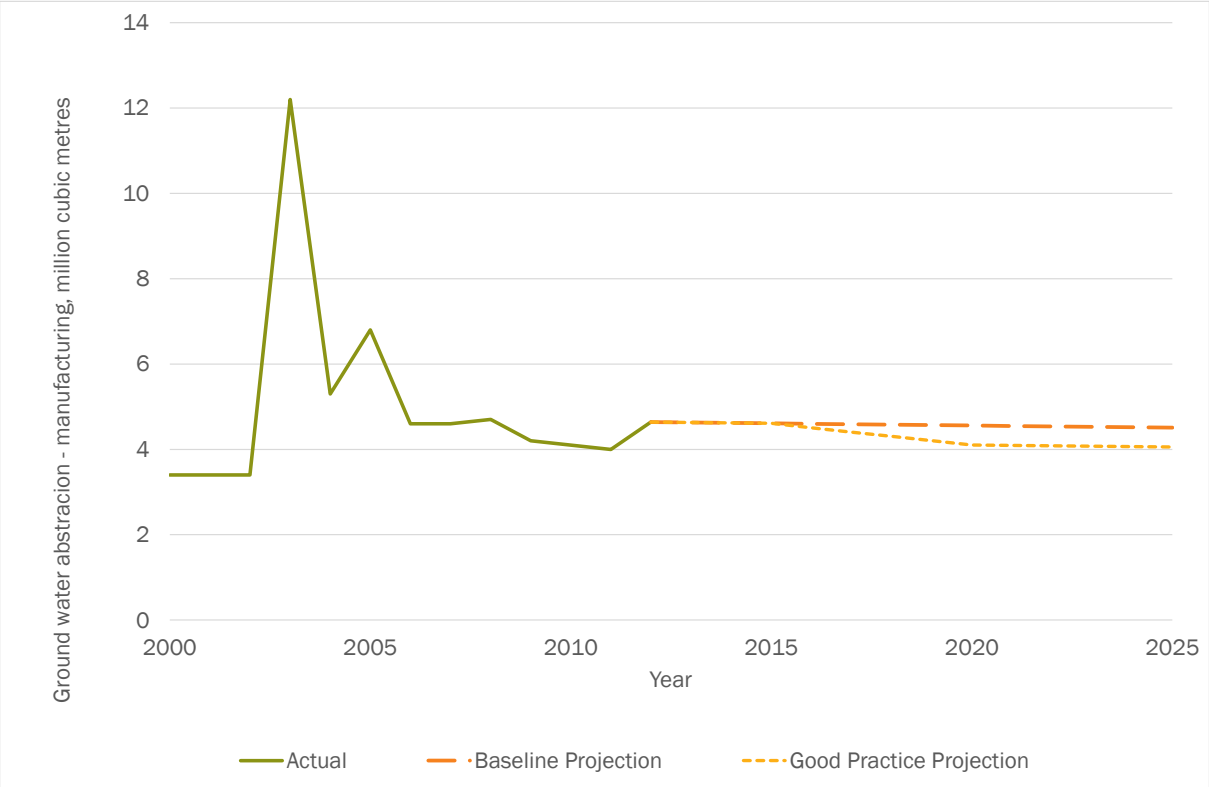


Figure 241: Change in Groundwater Abstraction – Agriculture, million cubic metres

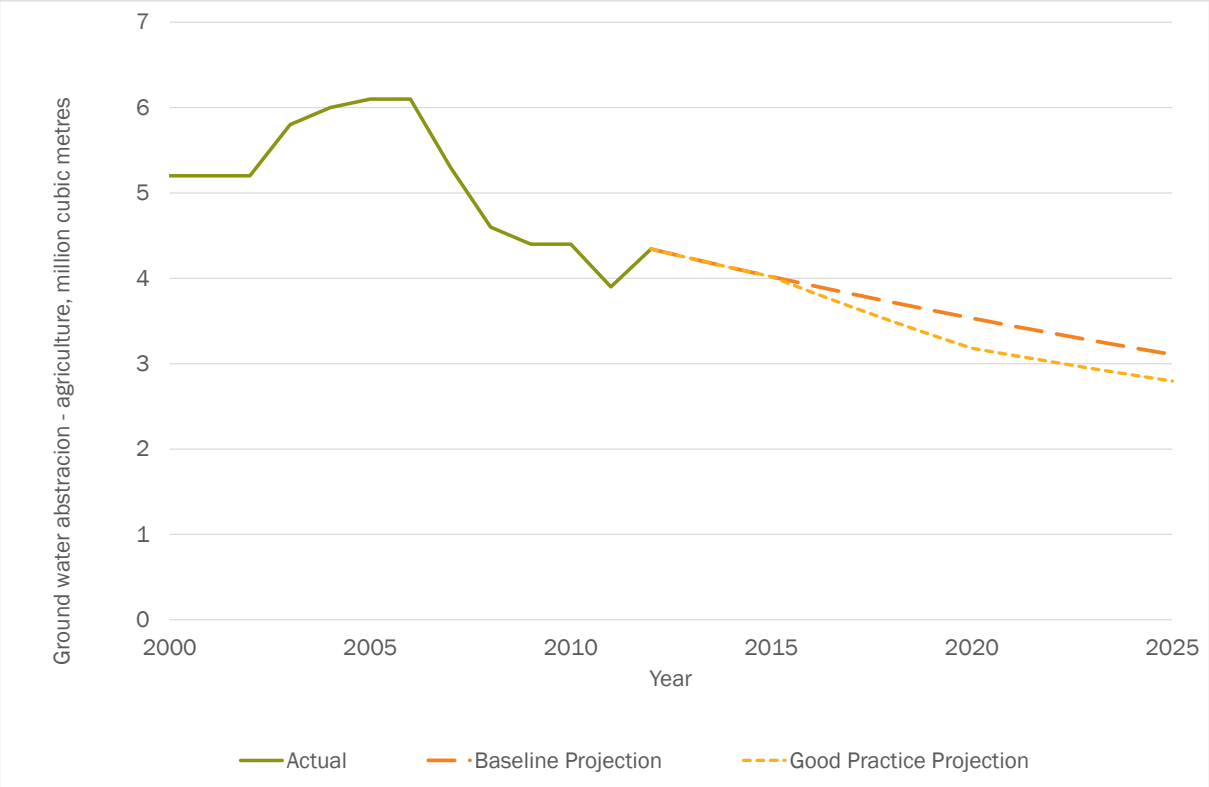


Figure 242: Change in Surface Water Abstraction – Public Supply, million cubic metres

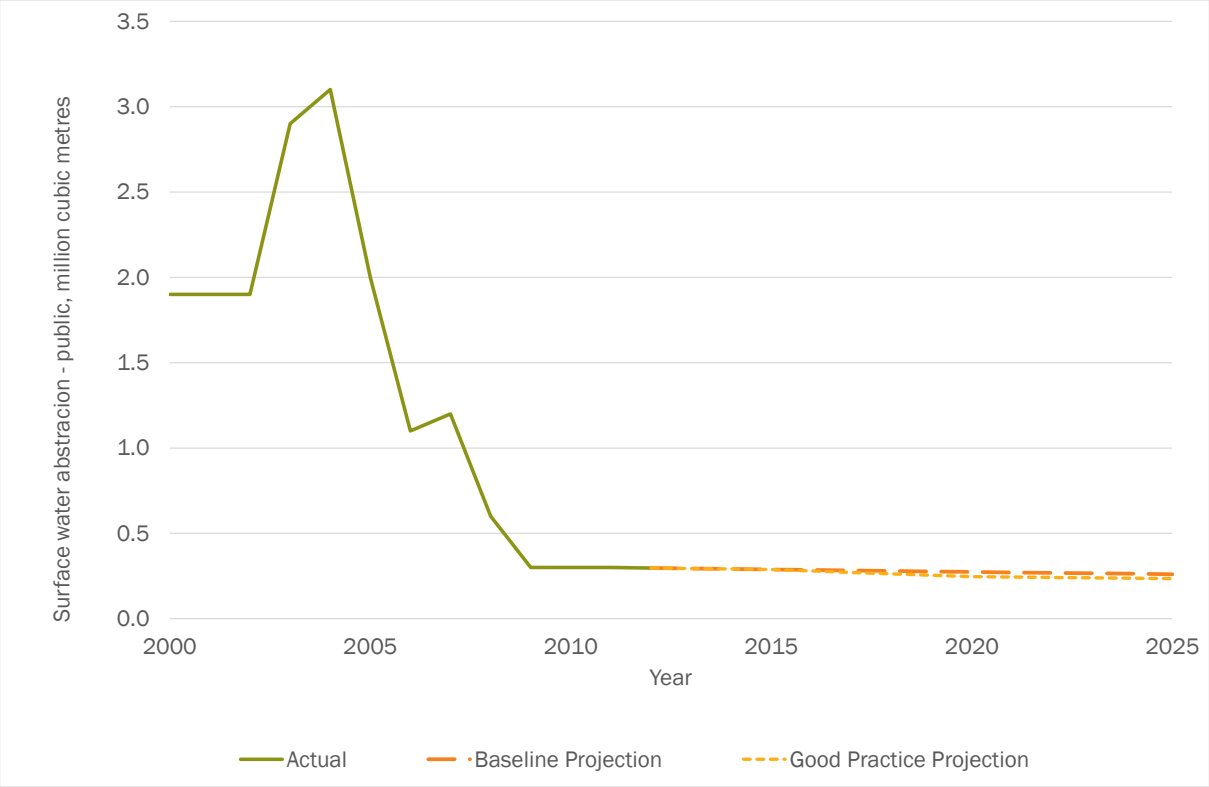


Figure 243: Change in Surface Water Abstraction – Manufacturing, million cubic metres

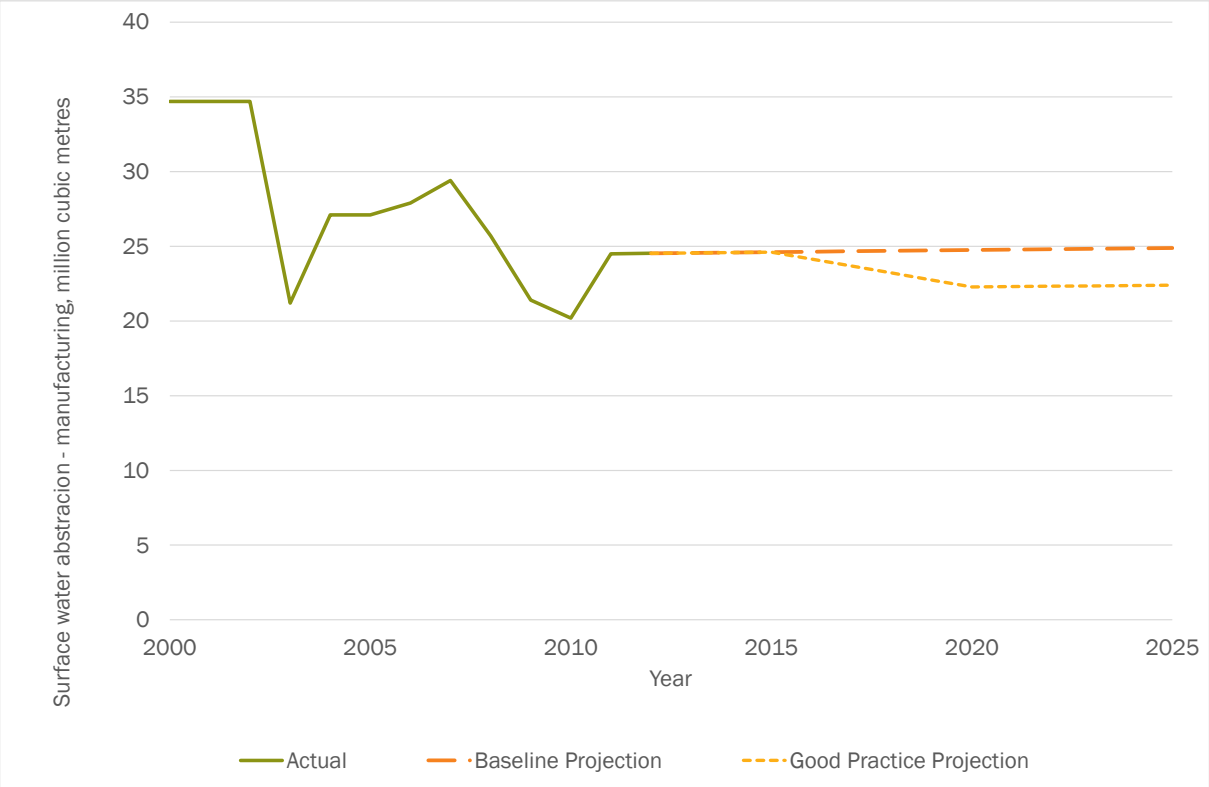


Figure 244: Change in Surface Water Abstraction – Agriculture, million cubic metres

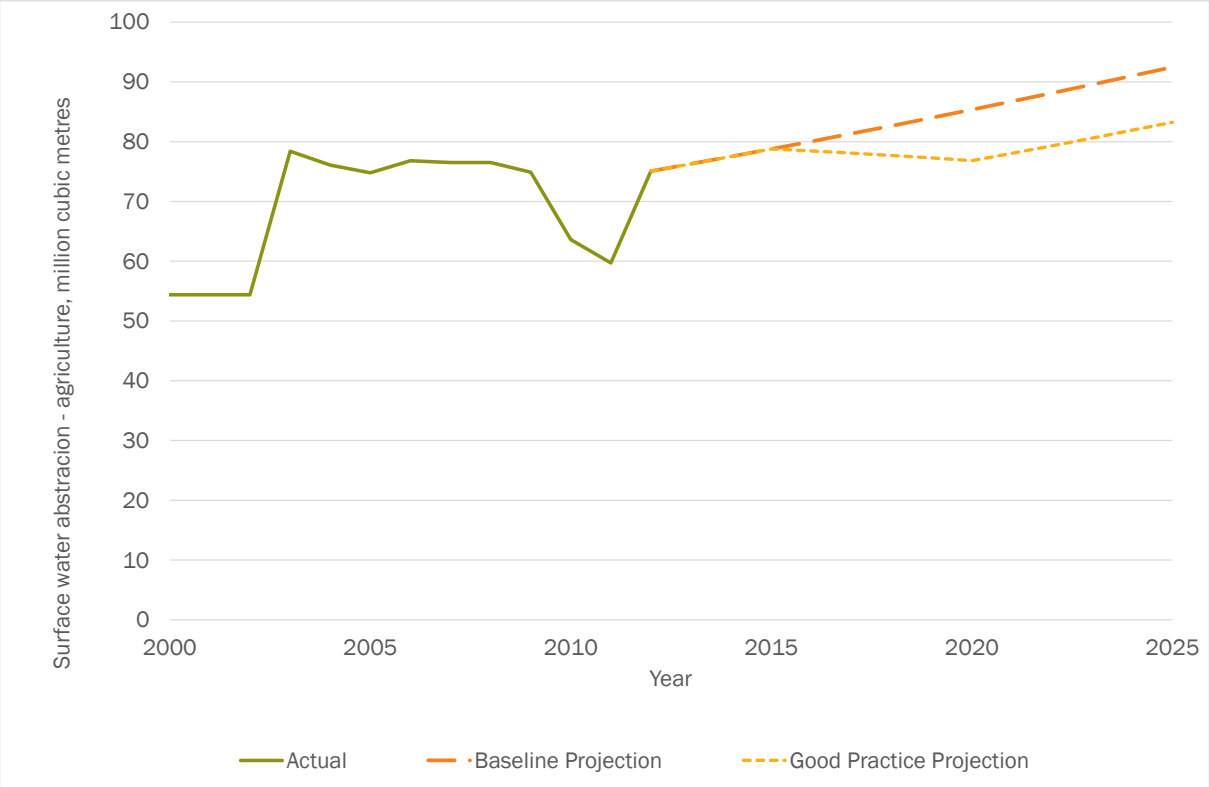


Figure 245: Change in Active Ingredients in Pesticides, tonnes

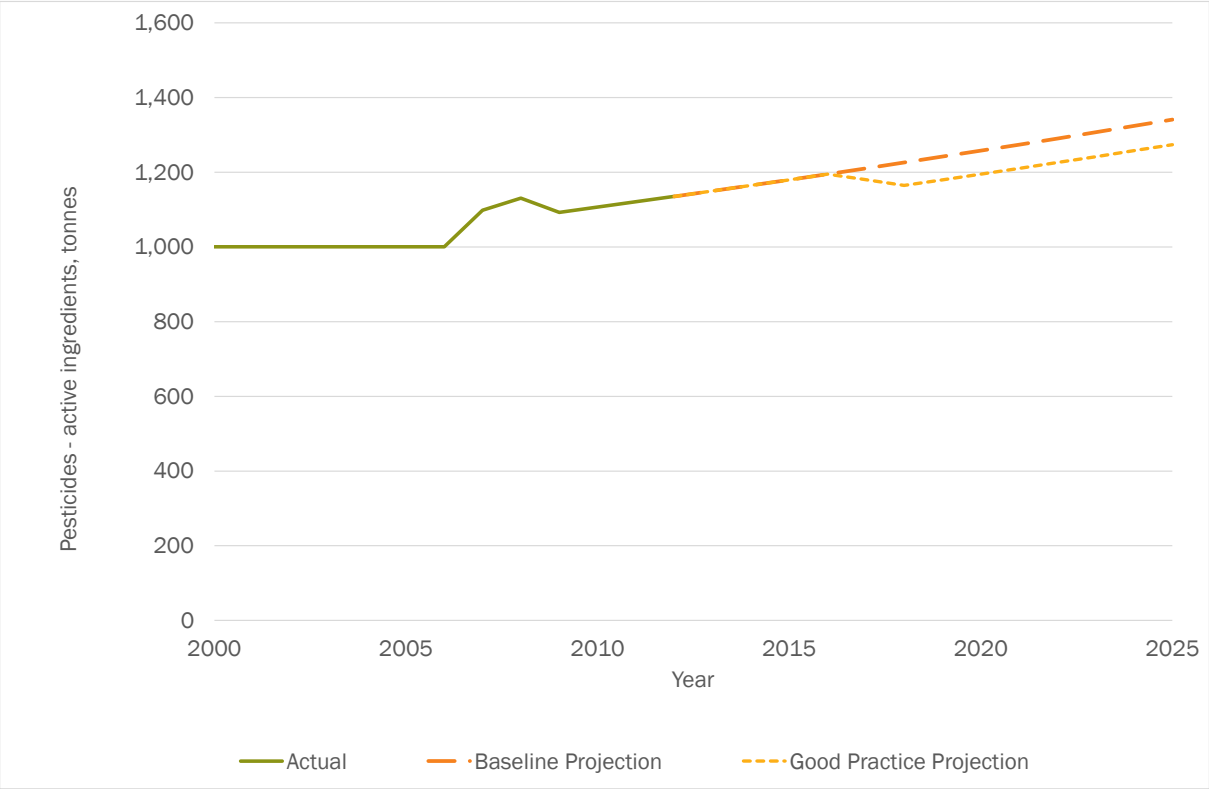


Figure 246: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

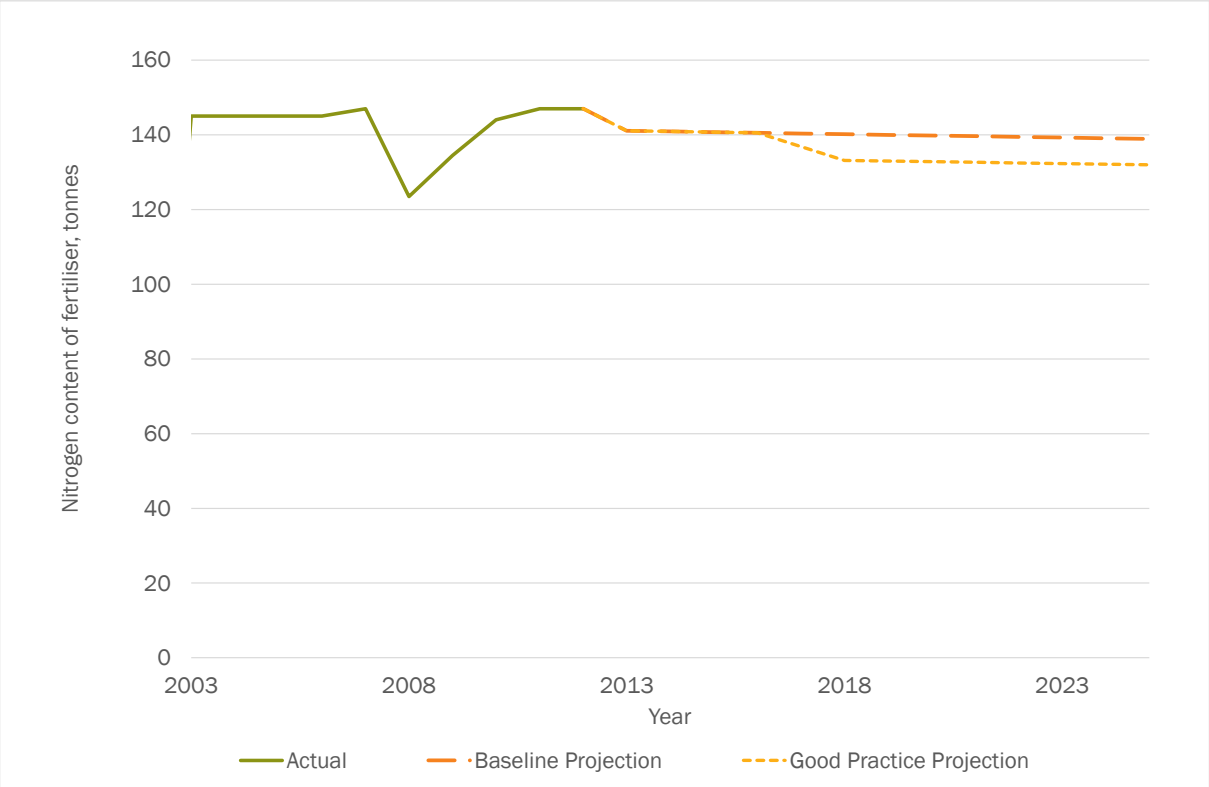


Figure 247: Change in Aggregates Extraction, thousand tonnes

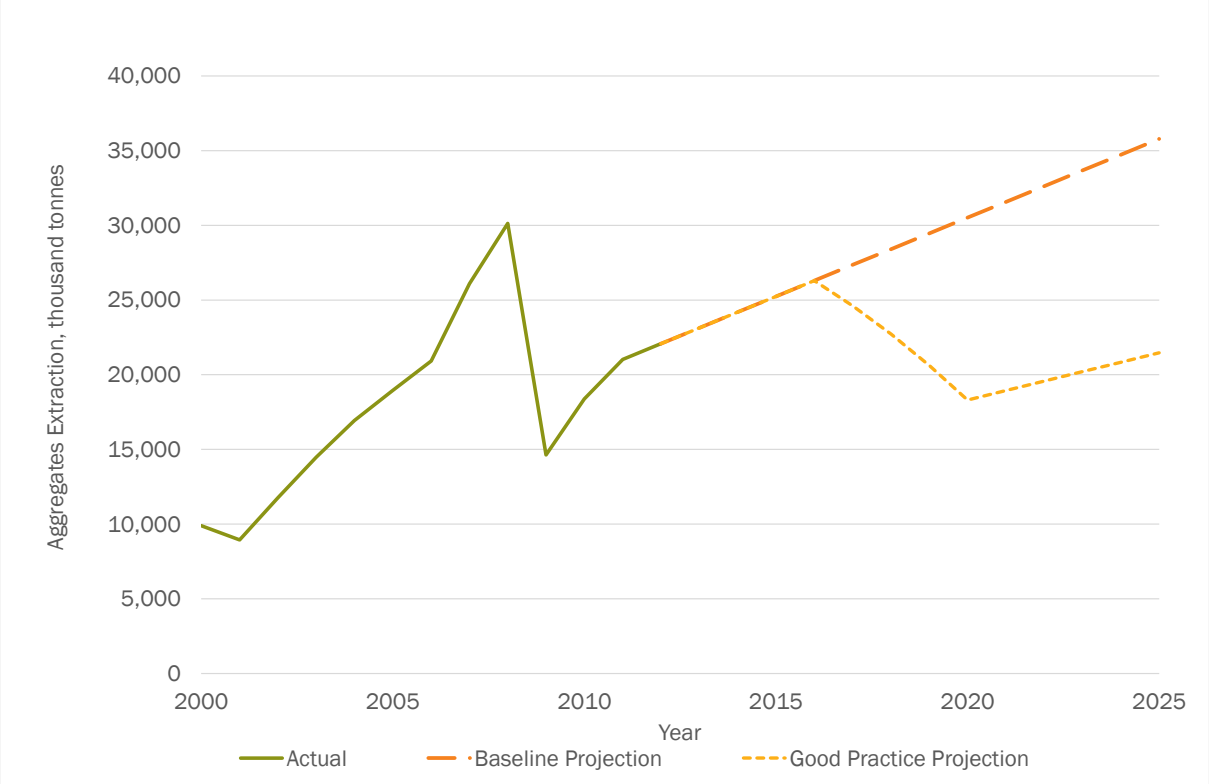


Figure 248: Change in Paper & Card Packaging Generation, thousand tonnes

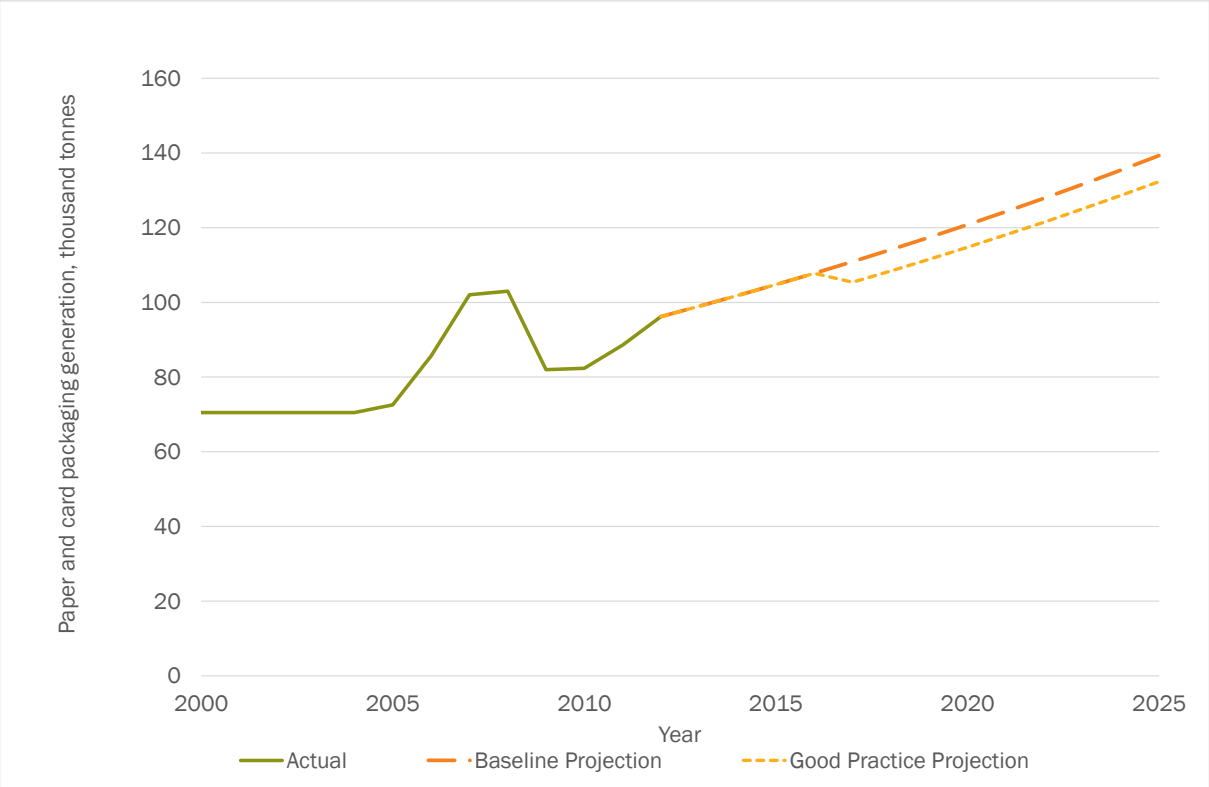


Figure 249: Change in Plastic Packaging Generation, thousand tonnes

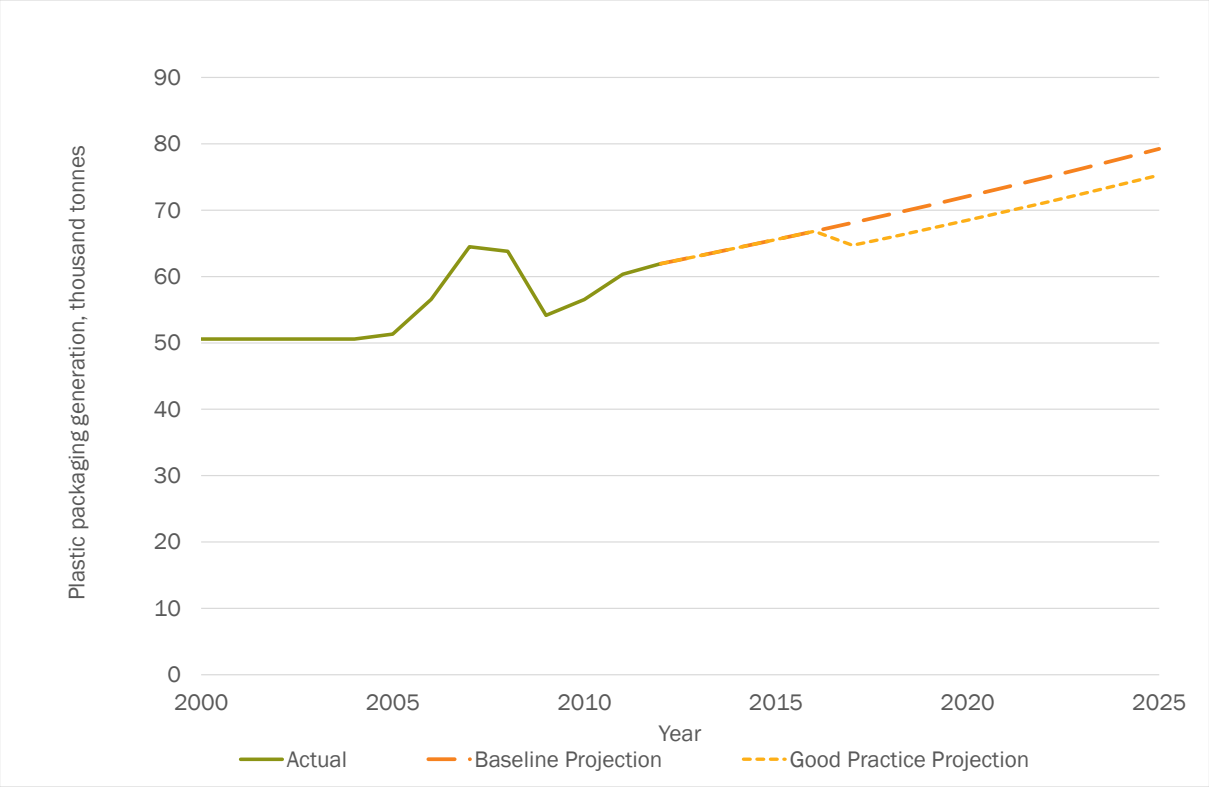


Figure 250: Change in Wood Packaging Generation, thousand tonnes

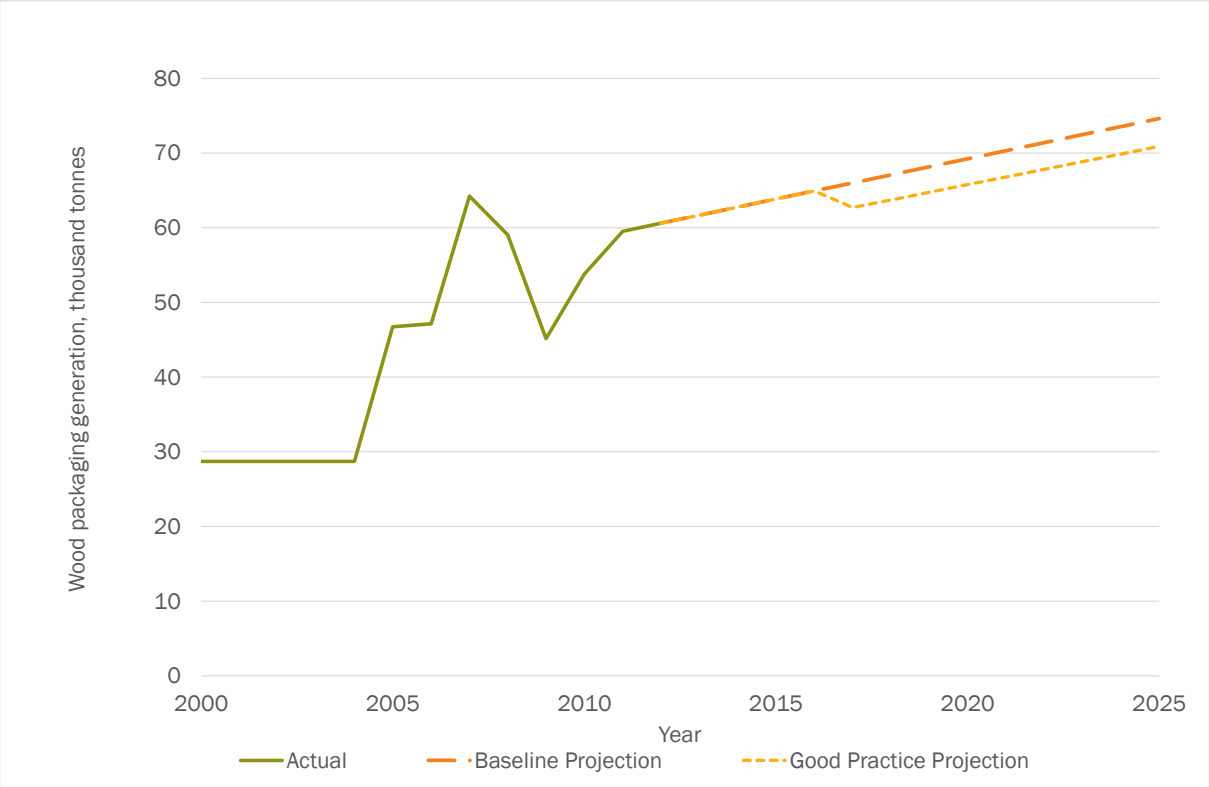


Figure 251: Change in Metal Packaging Generation, thousand tonnes

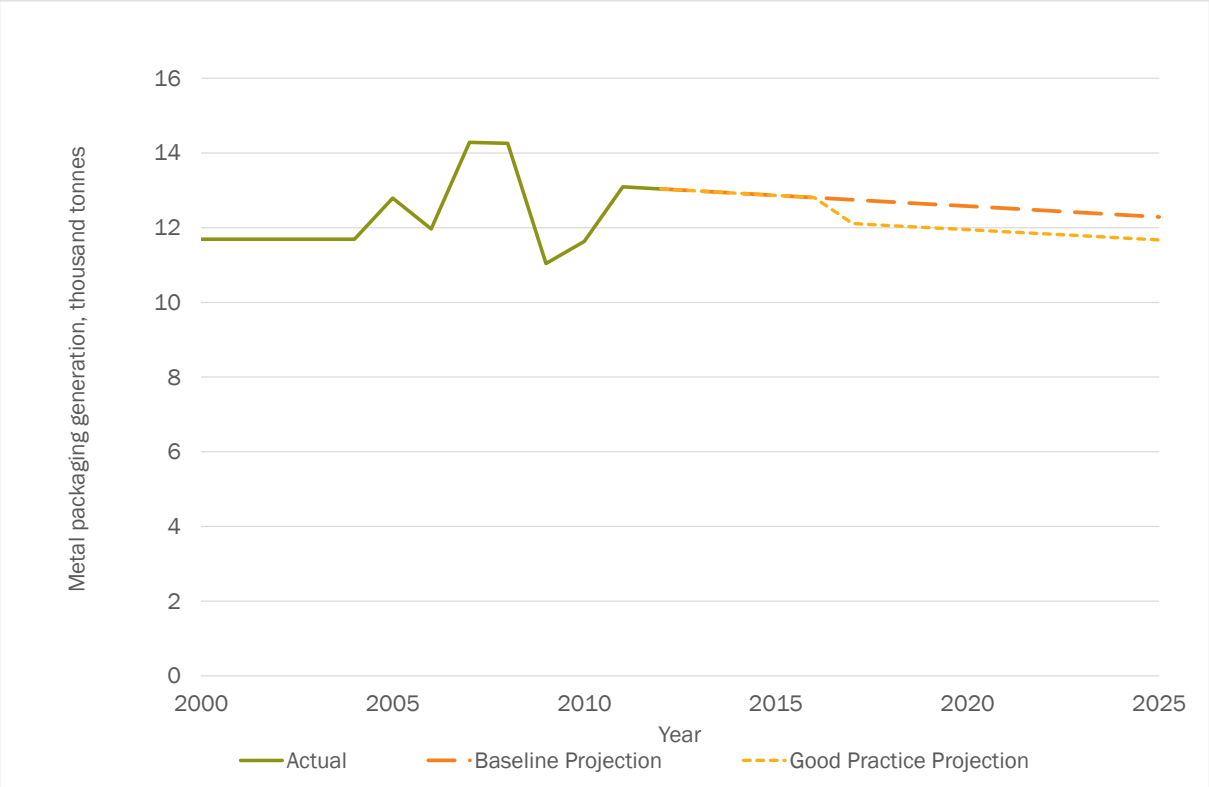


Figure 252: Change in Glass Packaging Generation, thousand tonnes

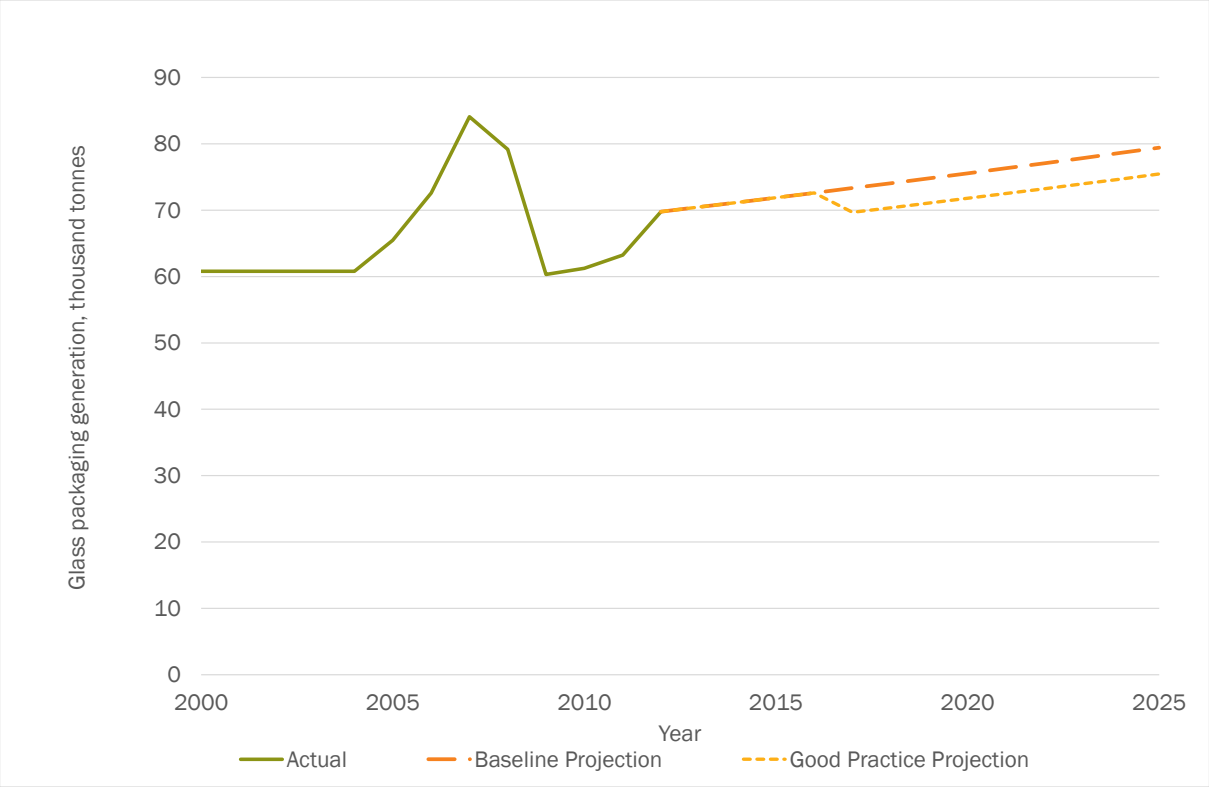
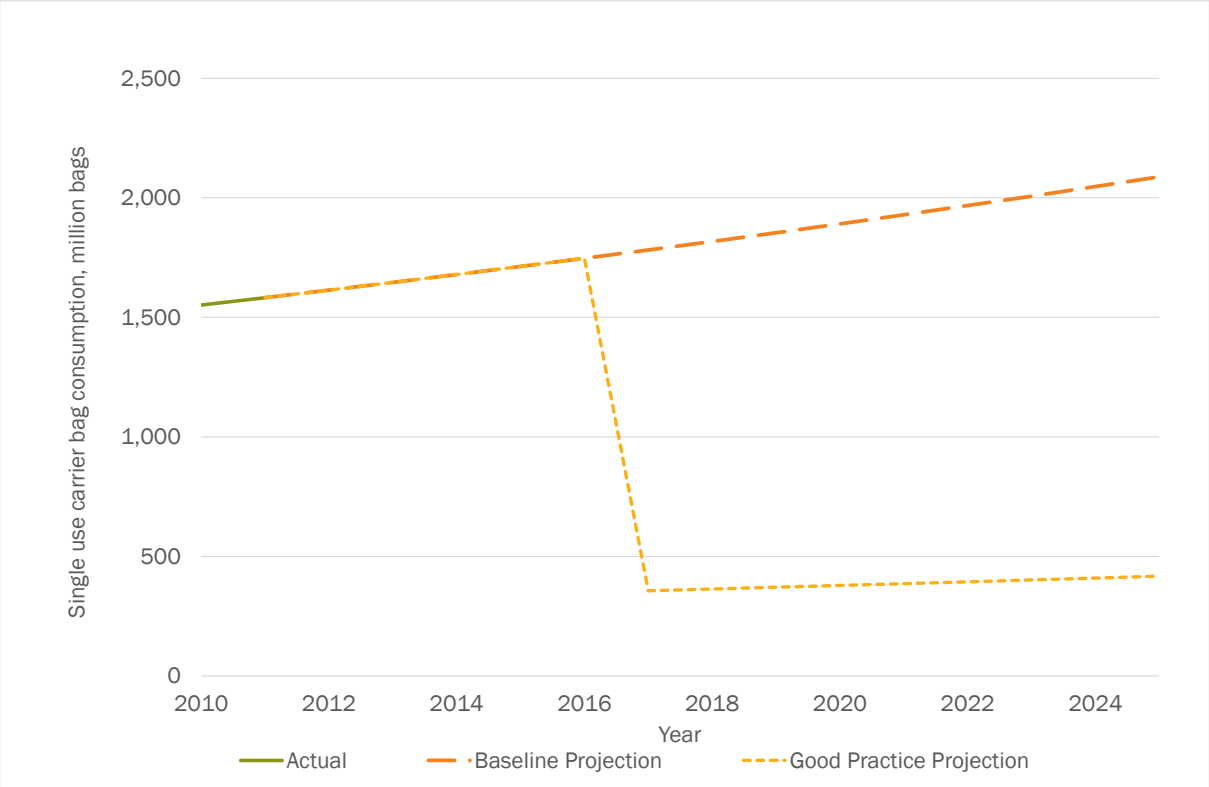


Figure 253: Change in Consumption of Single Use Carrier Bags, million bags



A.13.6 Full Revenue Outputs

Table 222: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	71	141	210	279	346	414	480	546	546	546
	C&I / Heating	0	0	7	13	20	26	32	38	44	49	49	49
	Electricity	0	1	2	3	4	5	6	6	7	8	8	8
	Sub-total Energy, million LTL	*0*	*1*	*79*	*157*	*233*	*309*	*384*	*458*	*531*	*604*	*604*	*604*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.1%*	*0.2%*	*0.2%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	128	262	400	544	748	777	807	839	871	905
	Passenger Aviation Tax	0	0	153	307	317	327	337	348	358	368	378	388
	Freight Aviation Tax	0	0	0.04	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	Sub-total Transport, million LTL	*0*	*0*	*281*	*569*	*717*	*871*	*1,085*	*1,124*	*1,165*	*1,207*	*1,249*	*1,294*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.4%*	*0.5%*	*0.6%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	83	150	206	253	293	283	278	273	268	264	259

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	2	4	7	10	14	15	15	16	17	18	19
	Air Pollution Tax	0	29	54	76	95	112	105	104	103	102	102	101
	Water Abstraction Tax	0	5	9	14	18	22	21	21	21	22	22	22
	Waste Water Tax	0	14	27	39	38	38	38	38	38	38	38	38
	Pesticides Tax	0	0	10	20	20	20	21	21	21	21	22	22
	Aggregates Tax	0	0	154	138	120	100	78	81	83	86	89	91
	Packaging Tax	0	0	33	32	33	33	34	35	35	36	36	37
	Single Use Bag Tax	0	356	364	74	76	77	79	80	82	84	85	87
	Fertiliser Tax	0.00	0.00	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Sub-total Pollution & Resource, million LTL	*0*	*490*	*807*	*607*	*663*	*709*	*673*	*674*	*674*	*675*	*676*	*676*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.4%*	*0.6%*	*0.4%*	*0.5%*	*0.5%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
	Total, million LTL	0	491	1,167	1,332	1,613	1,890	2,142	2,256	2,370	2,485	2,529	2,574

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.4%	0.9%	1.0%	1.1%	1.3%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%

A.14.0 Poland: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

A.14.1 Energy

- **Energy:** The Polish excise duties on fuels and electricity are shown in Table 24.

Table 223: Standard Rates of Excise Duties on Fuels and Electricity in Poland

Excise Duty	Unit	Rate Applied in Poland[4]
Transport Fuels		
Unleaded Petrol	€ per 1000 litres	PLN 1,668.16 (€397)[1]
Gas Oil (Diesel)	€ per 1000 litres	PLN 1,455.92 (€347)
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)[2]
Liquid Petroleum Gas	€ per 1000 kg	PLN 828.10 (€197)
Natural Gas	€ per GJ	PLN 0 (€0)
Motor Fuels – Industry / Commercial Use		
Gas Oil (Diesel)	€ per 1000 litres	PLN 1,455.92 (€347)
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)
Liquid Petroleum Gas	€ per 1000 kg	PLN 828.10 (€197)
Natural Gas	€ per GJ	PLN 0 (€0)
Heating – Business Use		
Gas Oil (Diesel)	€ per 1000 litres	PLN 232.00 (€55)
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)[3]

Excise Duty	Unit	Rate Applied in Poland[4]
Heavy Fuel Oil	€ per 1000 kg	PLN 64.00 (€15)
Liquid Petroleum Gas	€ per 1000 kg	PLN 0 (€0)
Natural Gas	€ per GJ	PLN 0 (€0)
Coal and Coke	€ per GJ	PLN 1.28 (€0.30)
Heating – Non-Business Use		
Gas Oil (Diesel)	€ per 1000 litres	PLN 232.00 (€55)
Kerosene	€ per 1000 litres	PLN 1,822.00 (€434)[3]
Heavy Fuel Oil	€ per 1000 kg	PLN 64.00 (€15)
Liquid Petroleum Gas	€ per 1000 kg	PLN 0 (€0)
Natural Gas	€ per GJ	PLN 0 (€0)
Coal and Coke	€ per GJ	PLN 1.28 (€0.30)
Electricity		
Business Use	€ per MWh	PLN 20.00 (€4.76)
Non-Business Use	€ per MWh	PLN 20.00 (€4.76)

Notes:

1. This rate is for CN 2710 1145, and CN 2710 1149. CN 2710 1141 is taxed at a rate of PLN 1,822.00 (€434) per 1000 litres. CN 2710 1131 has a total exemption from excise duty

2. This rate is for CN 2710 1925. CN 2710 1921 is taxed at a rate of PLN 1,446.00 (€344). CN 2710 1921 has a total exemption from excise duty

3. This rate is for CN 2710 1925. CN 2710 1921 is taxed at a rate of PLN 232.00 (€55). CN 2710 1921 has a total exemption from excise duty for industry & commercial use.

4. The exchange rate used is the 2013 average figure which is taken from: Eurostat (2013) ECU/ECR Exchange Rates versus National Currencies, *Accessed 3rd February 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1 this updates the exchange rate used in the Excise Duty Tables from 01/10/12 therefore the Euro rates in this table are not the same as the rates in the excise duty tables..*

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

A.14.2 Transport (excl. transport fuels)[925]

- Exercise duty - cars:
  - Tax rate set by: central authority
  - Beneficiary: central authority
  - Rates:
    - for passenger cars with engine cubic capacity over 2,000 cm2 – 18.6 % of the tax basis,
    - for others – 3.1% of the tax basis.
  - Revenue: In 2011, revenues were PLN 1,266 million, equivalent to 0.08% of GDP.
- Motor vehicles tax:
  - Tax rate set by: local authority
  - Beneficiary: local authority
  - Rates: rates set by local government cannot exceed relevant minimal and maximal rates constituted in Act of 12 January 1991 on local taxes and charges
  - Revenue: In 2011, revenues were PLN 894 million, equivalent to 0.06% of GDP.

[925] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=38/1357119656&taxType=Other+indirect+tax

A.14.3 Change in Tax Bases

Table 224: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	13,141	12,929	-212
Petrol	million litres	4,288	4,286	-2
Kerosene	million litres	478	478	0
LPG	thousand tonnes	1,383	1,184	-199
Heavy Fuel Oil	thousand tonnes	213	208	-5
Natural Gas	TJ (GCV)	0	0	0
Coal	thousand tonnes	17,620	16,013	-1,607
Electricity	GWh	129,181	129,181	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[926] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[926] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 254: Change in Internal Passenger Flights, flights per year

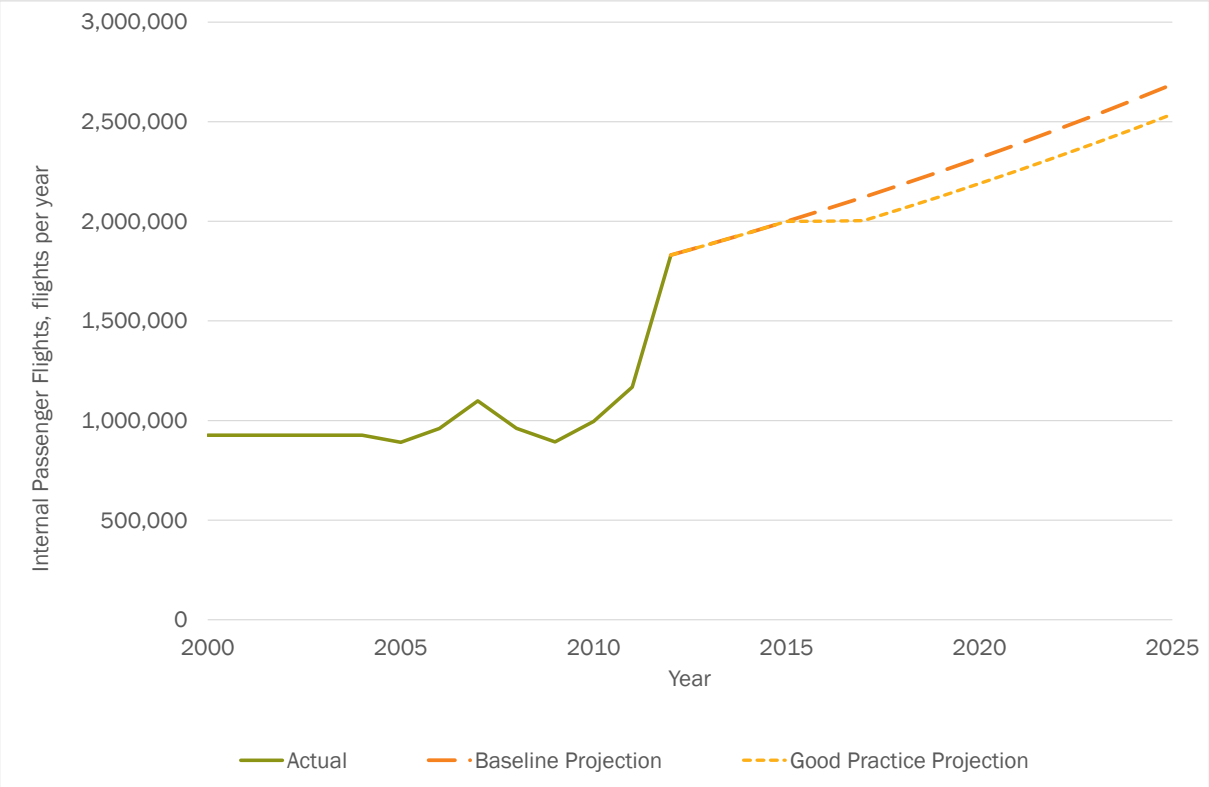


Figure 255: Change in Intra-EU Passenger Flights, flights per year

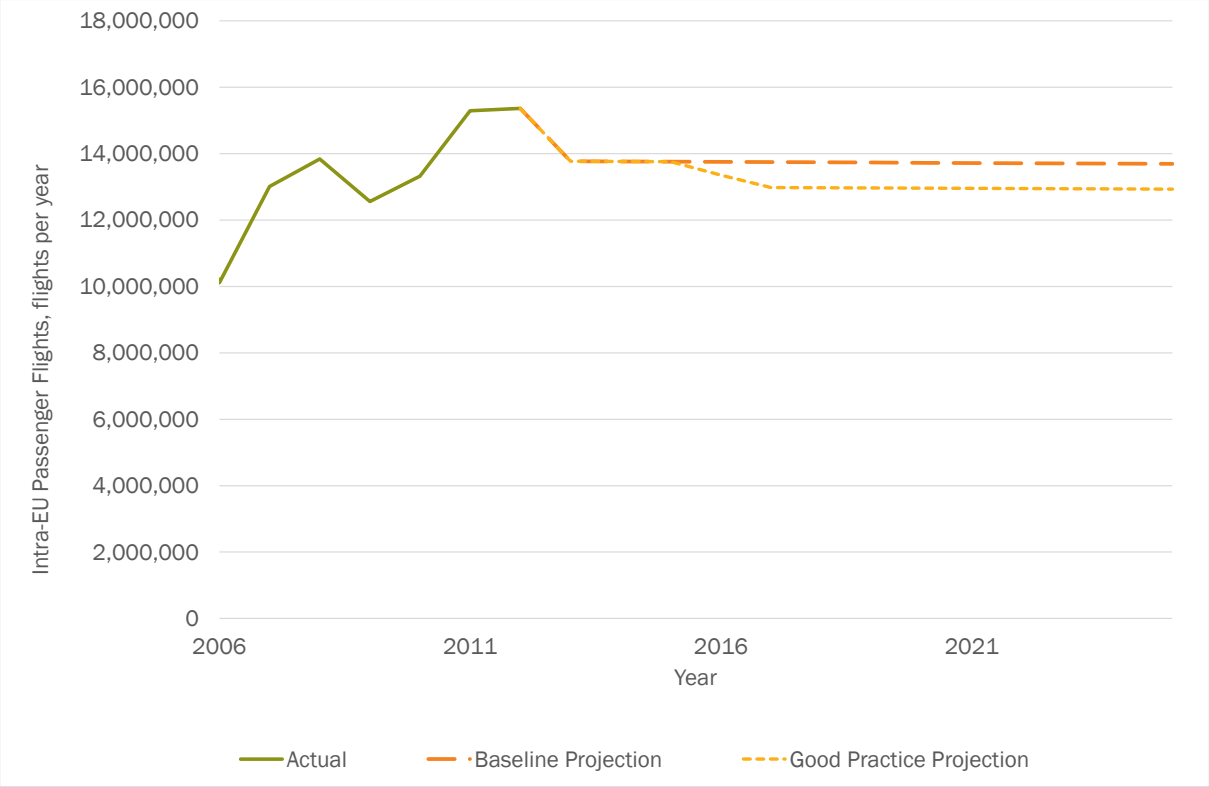


Figure 256: Change in Extra-EU Passenger Flights, flights per year

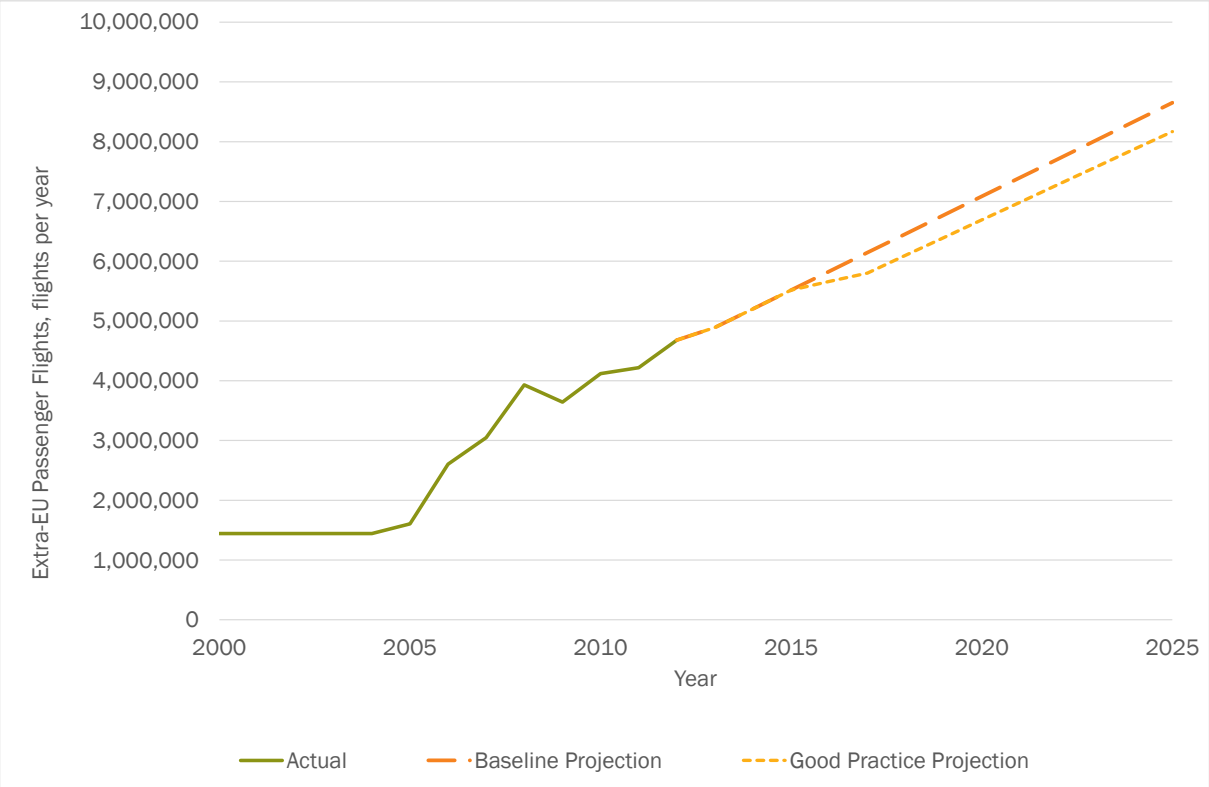


Figure 257: Change in Internal Air-freight, tonnes

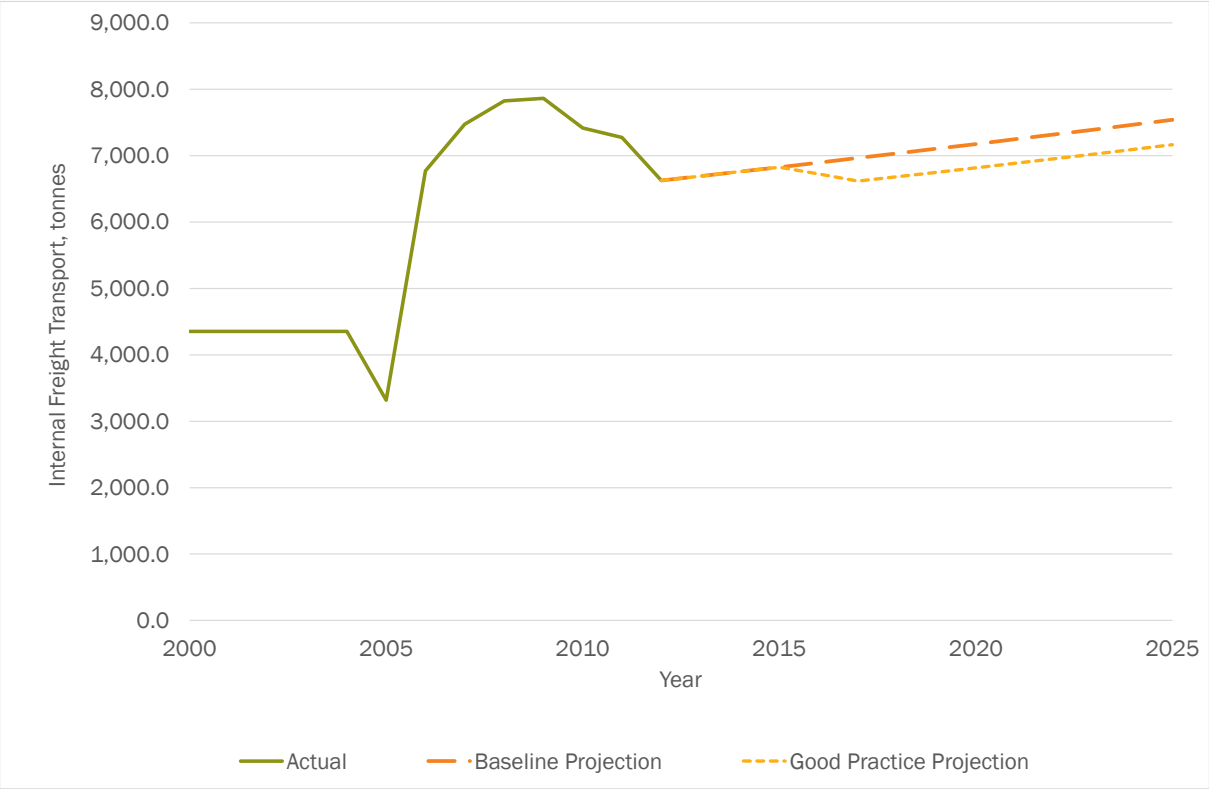


Figure 258: Change in Intra-EU Air-freight, tonnes

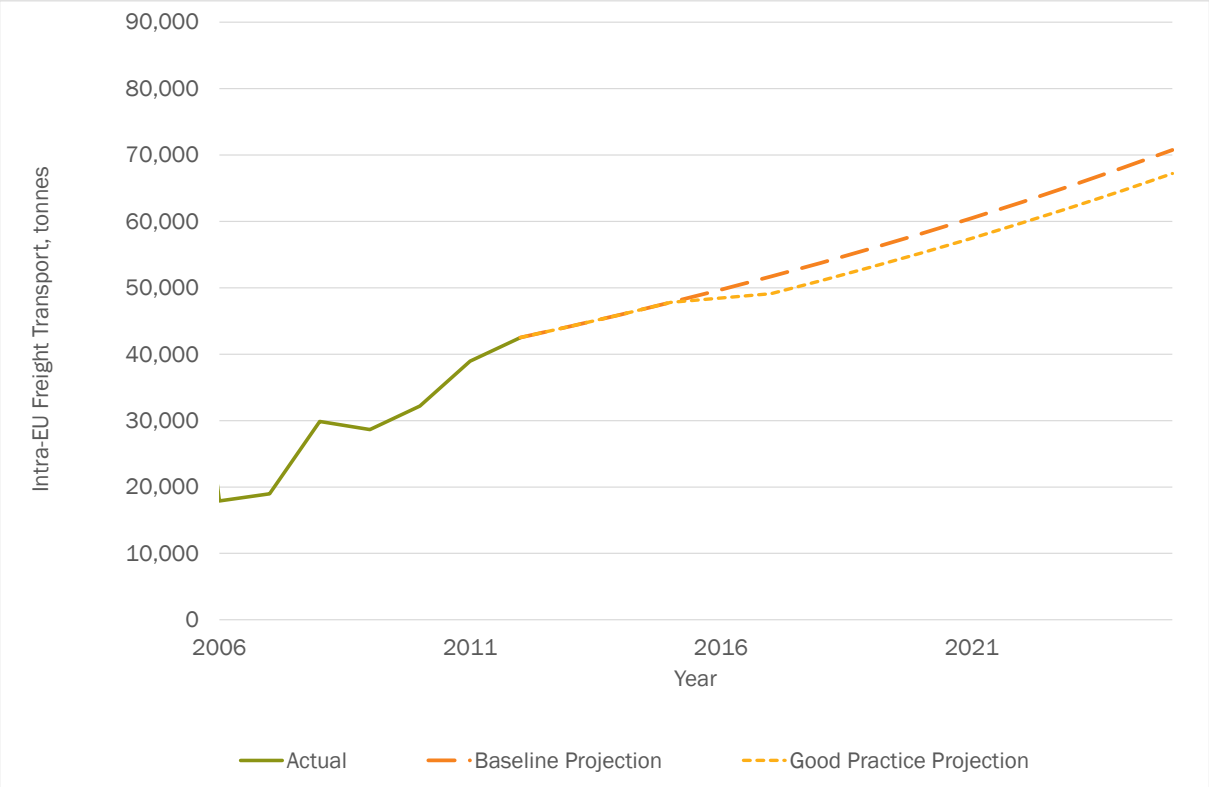


Figure 259: Change in Extra-EU Air-freight, tonnes

Figure 260: Change in Non-Hazardous Waste Landfilled, thousand tonnes

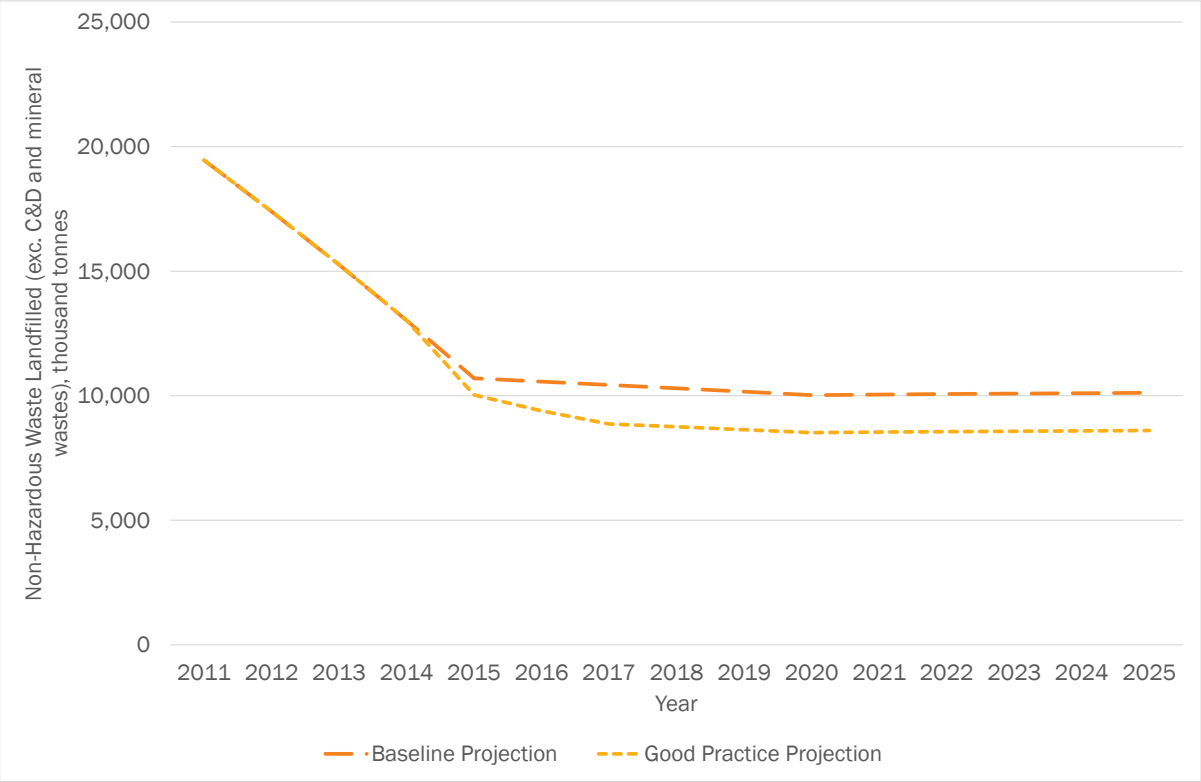


Figure 261: Change in MBT/ Incineration, thousand tonnes

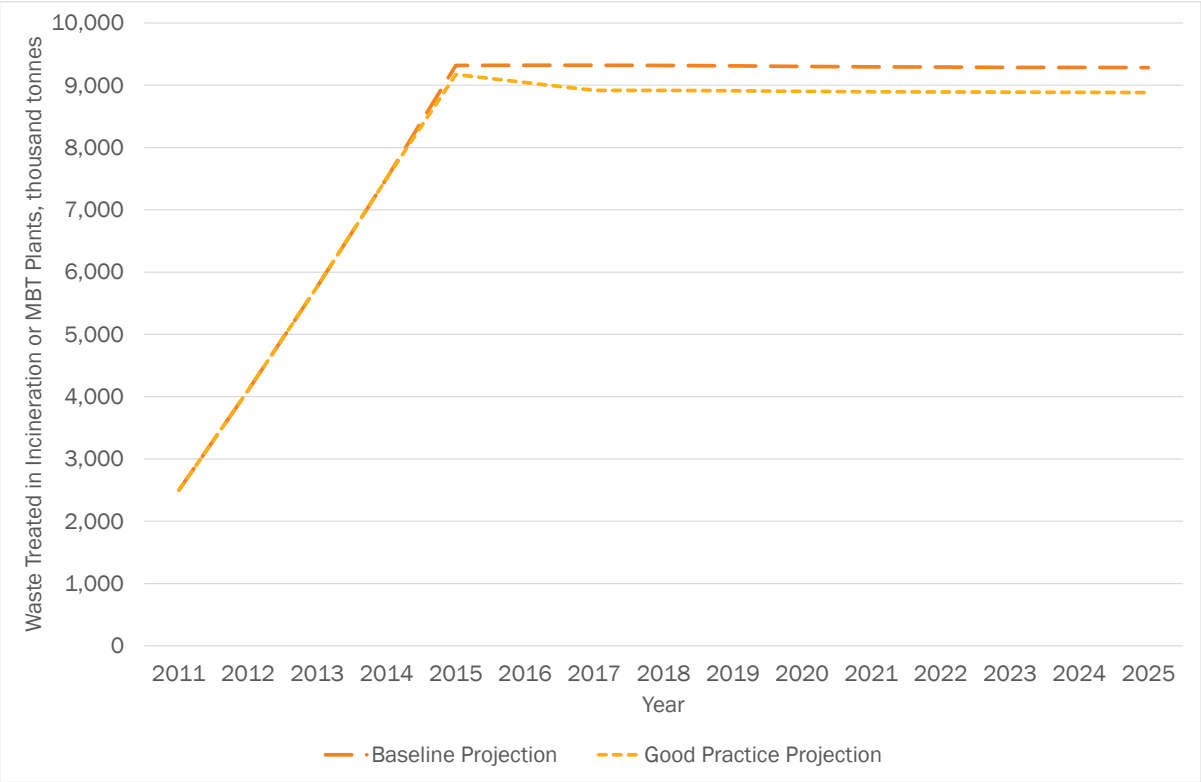


Figure 262: Change in SOx Emissions, tonnes

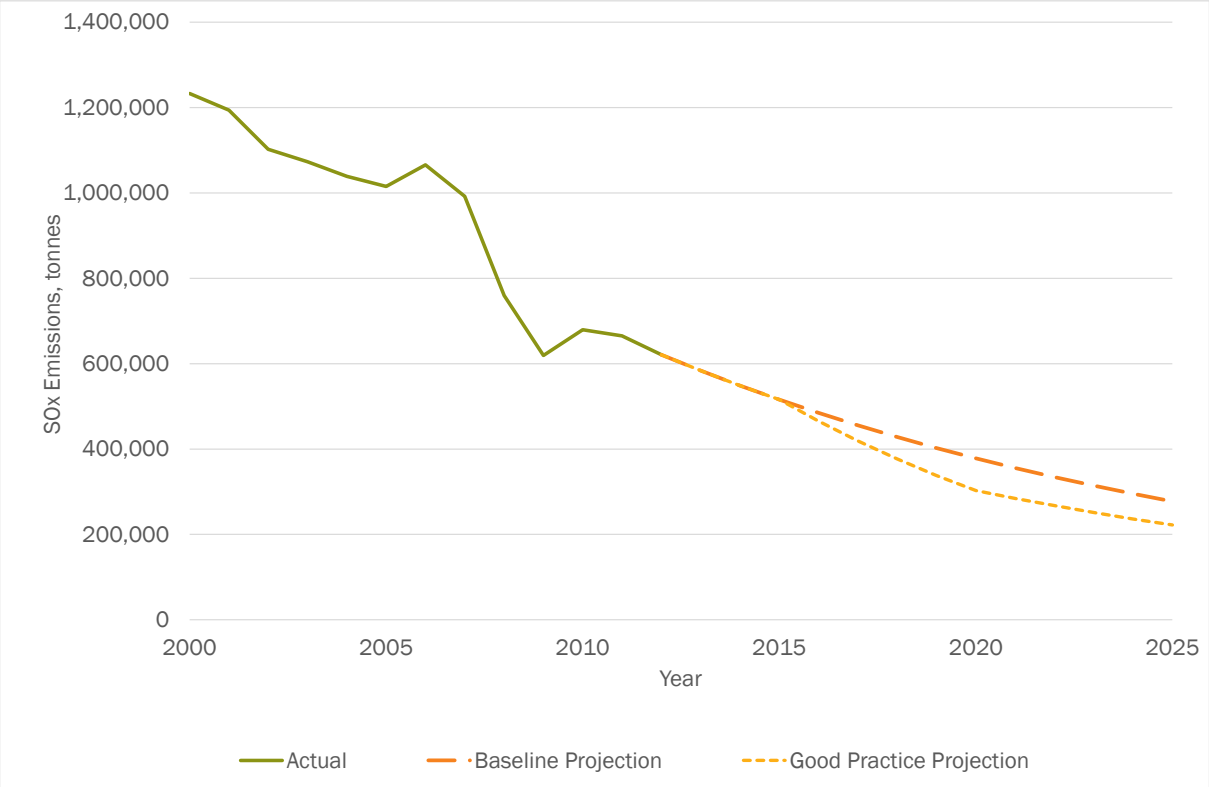


Figure 263: Change in NOx Emissions, tonnes

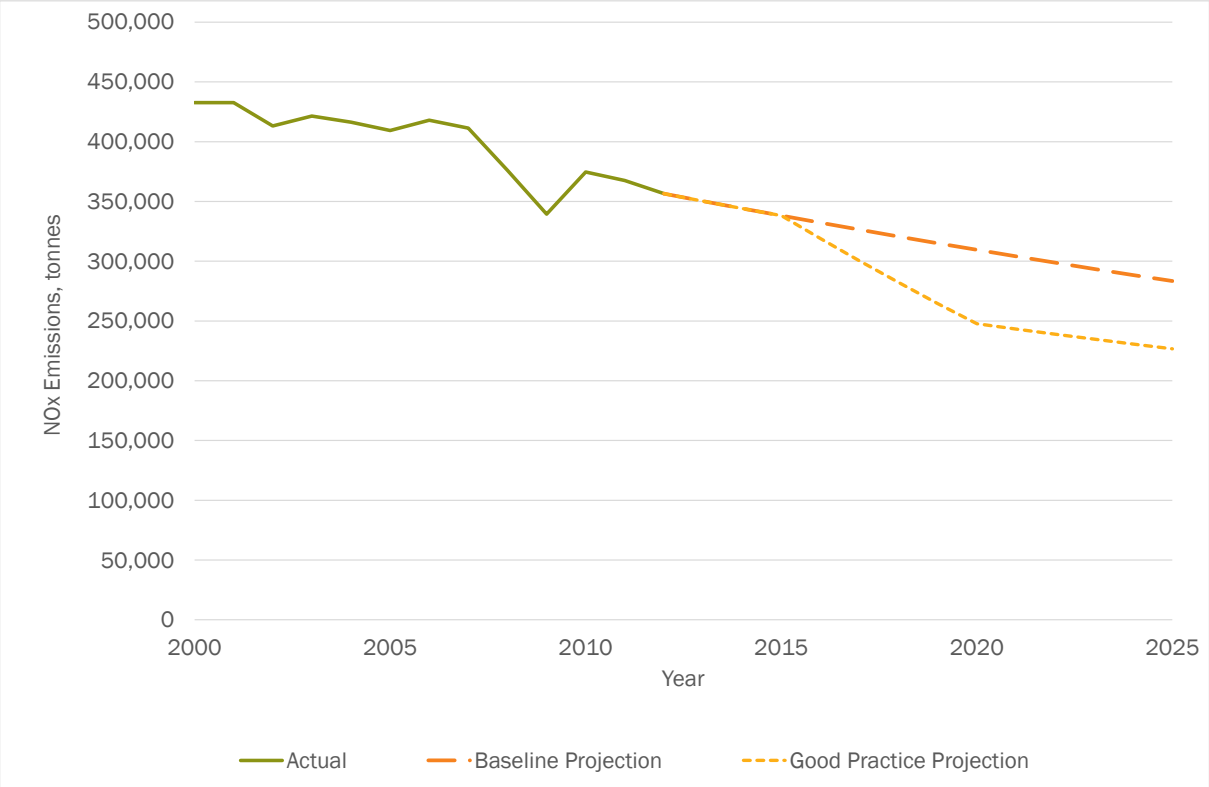


Figure 264: Change in PM_{10} Emissions, tonnes

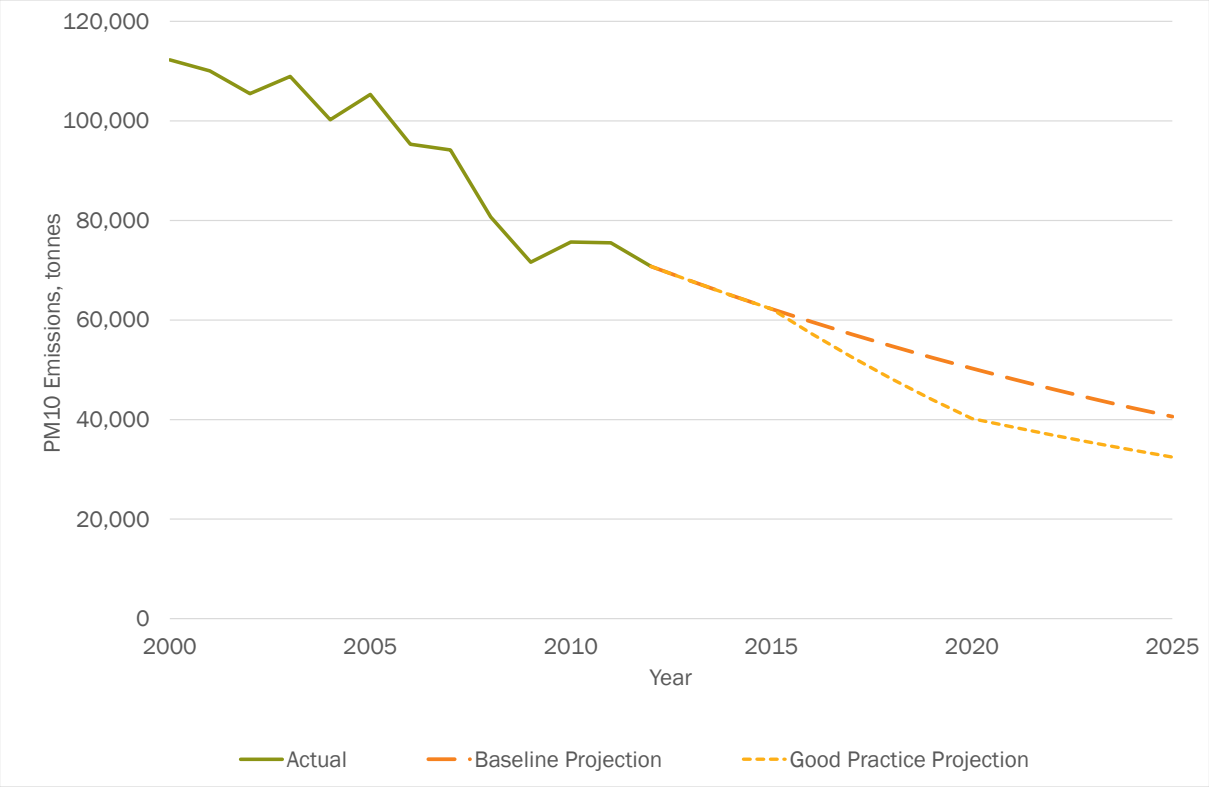


Figure 265: Change in Groundwater Abstraction – Public Supply, million cubic metres

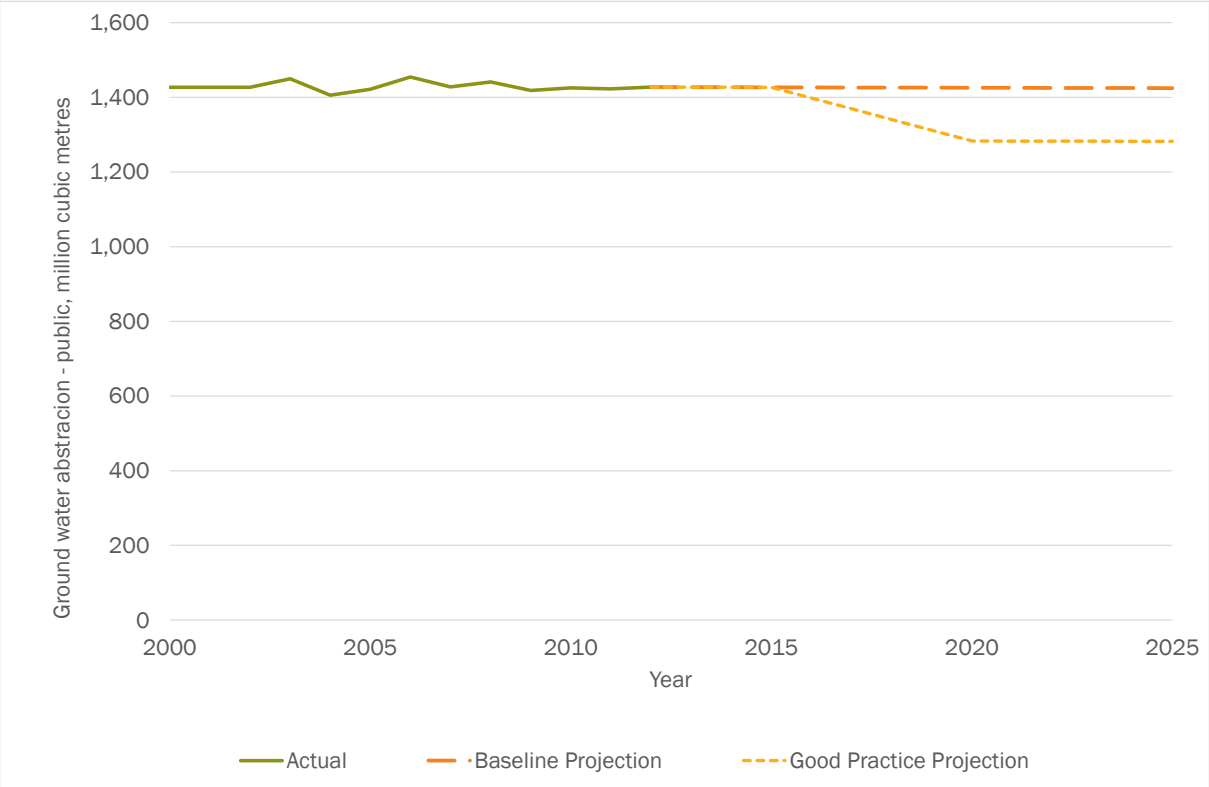


Figure 266: Change in Groundwater Abstraction – Manufacturing, million cubic metres

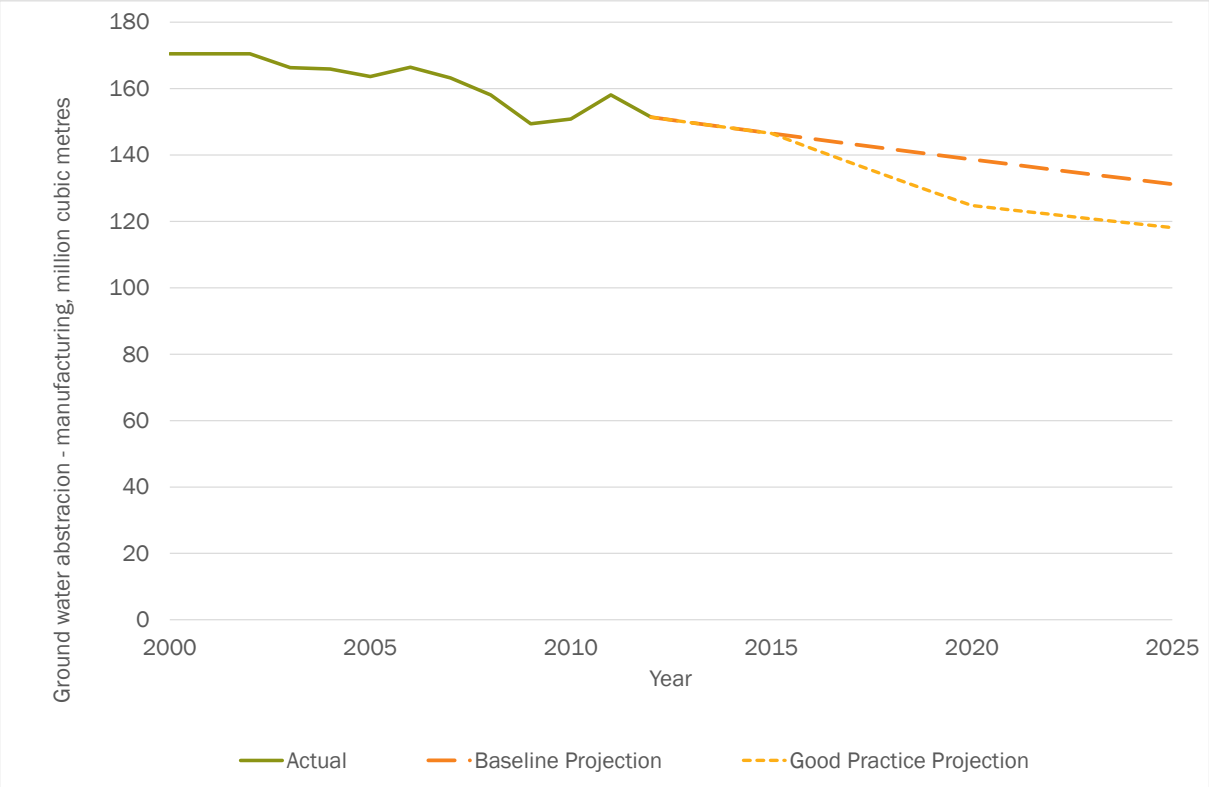


Figure 267: Change in Groundwater Abstraction – Agriculture, million cubic metres

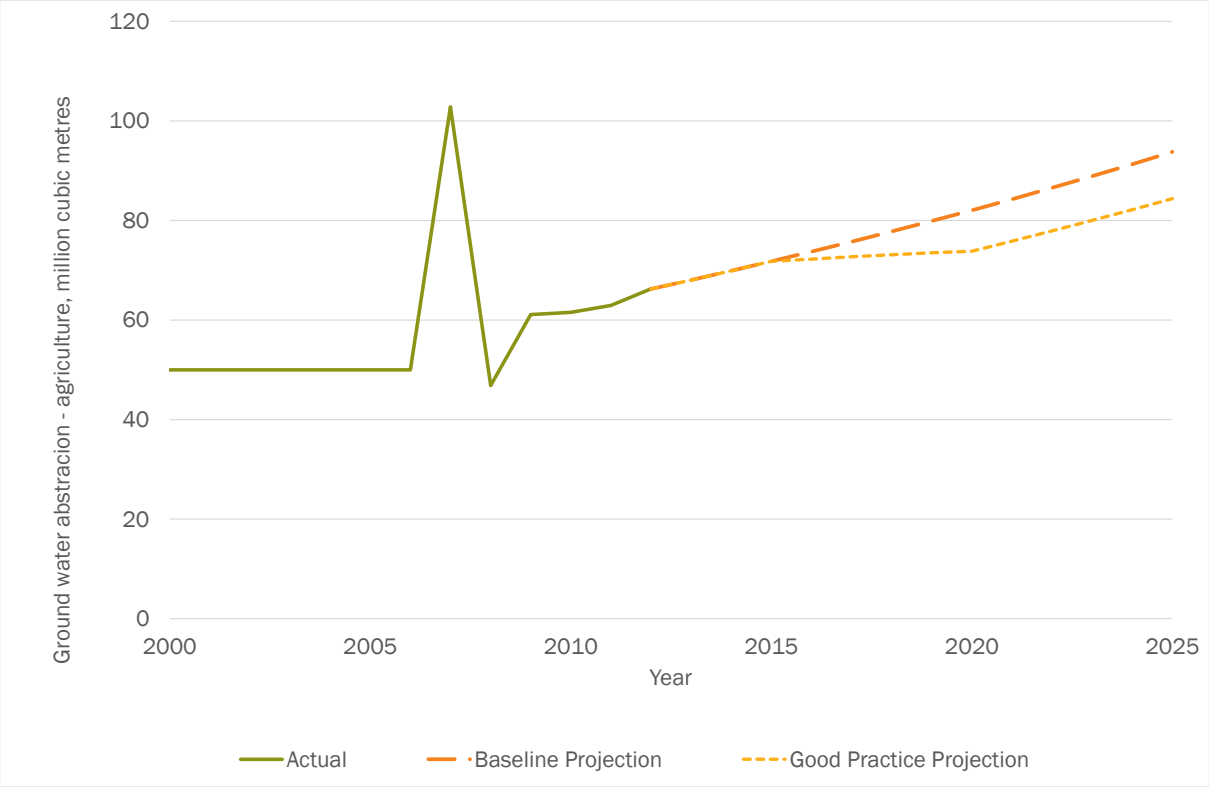


Figure 268: Change in Surface Water Abstraction – Public Supply, million cubic metres

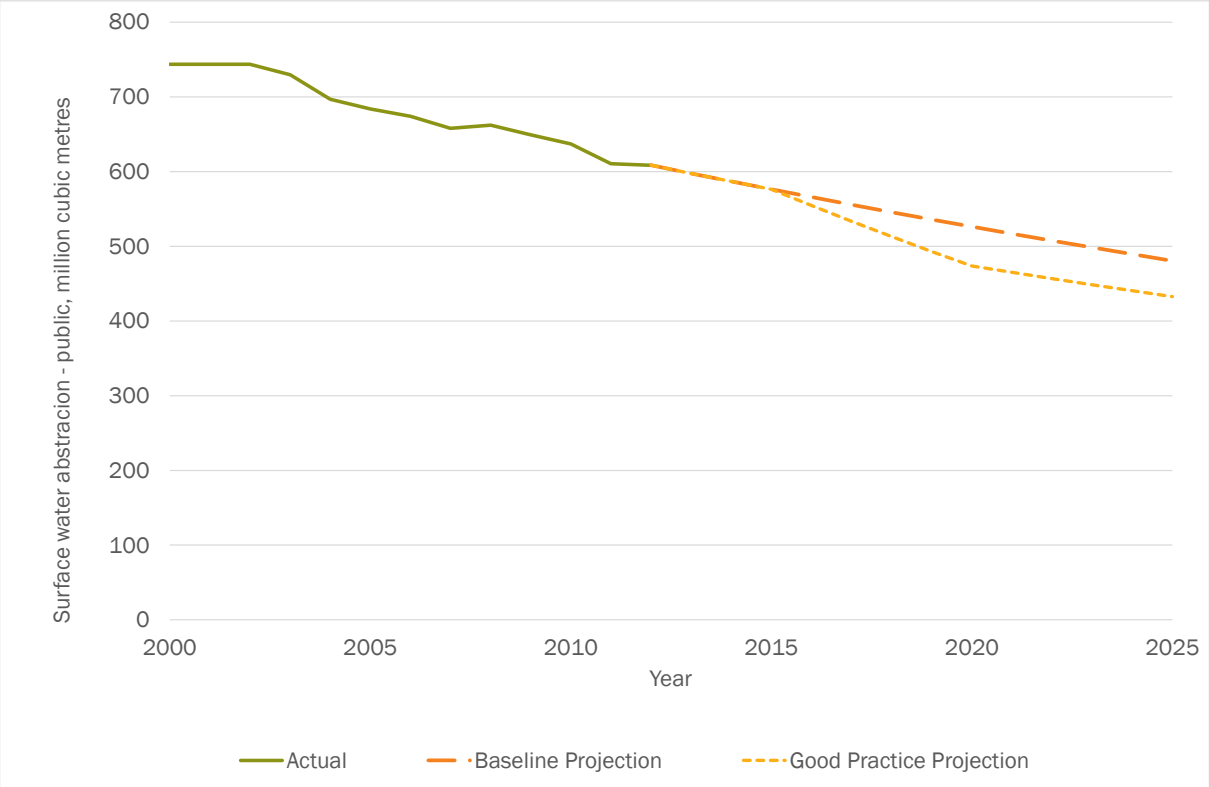


Figure 269: Change in Surface Water Abstraction – Manufacturing, million cubic metres

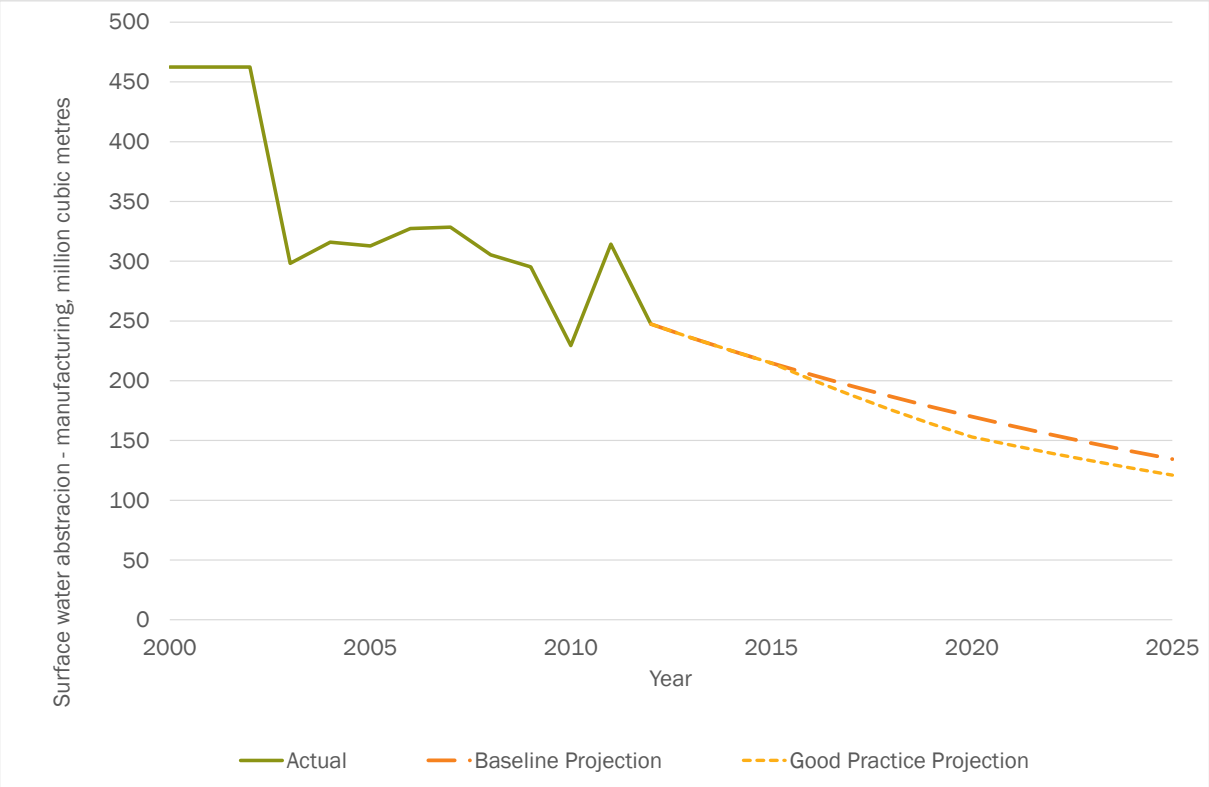


Figure 270: Change in Surface Water Abstraction – Agriculture, million cubic metres

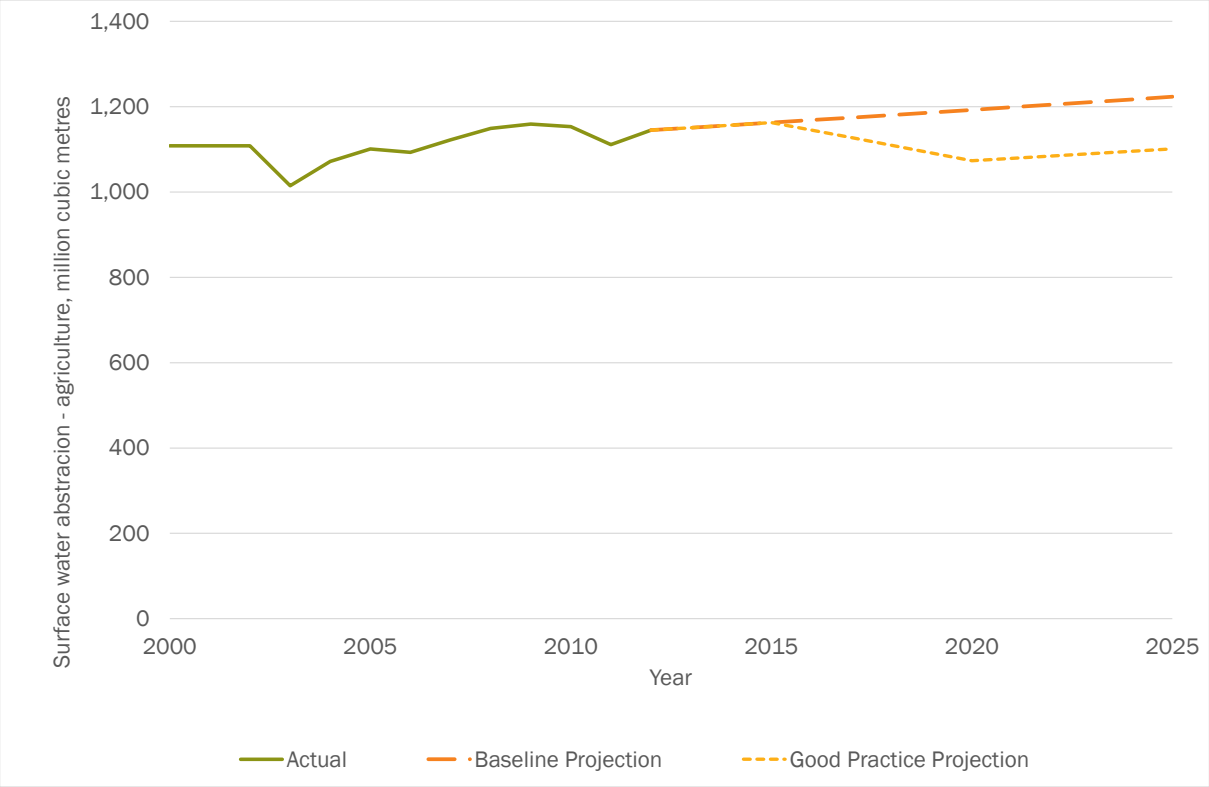


Figure 271: Change in Active Ingredients in Pesticides, tonnes

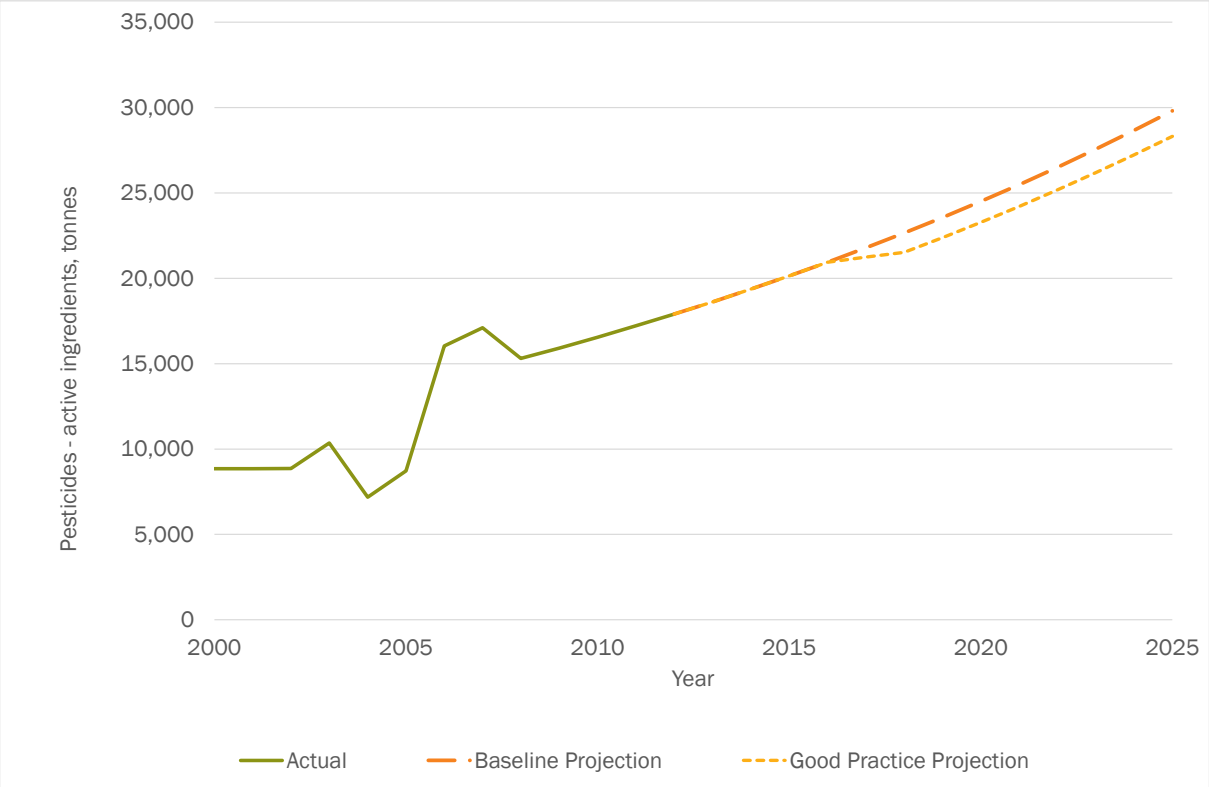


Figure 272: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

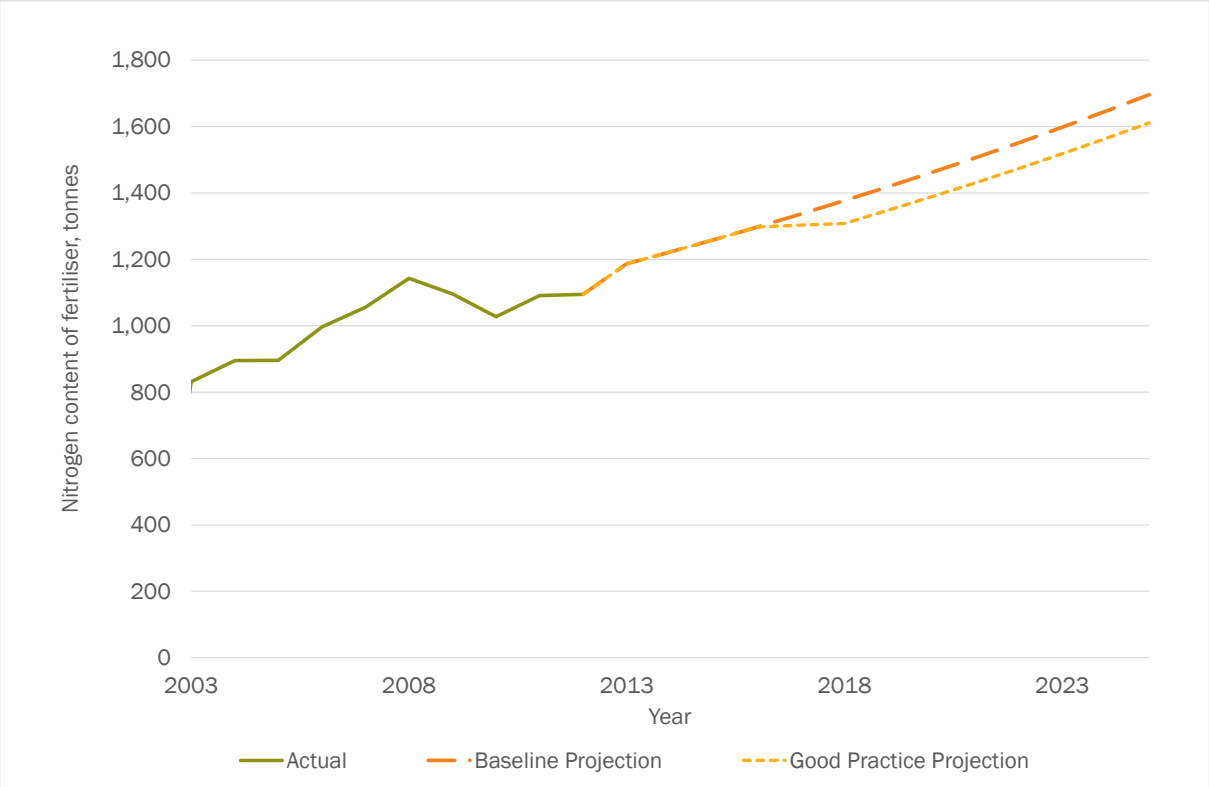


Figure 273: Change in Aggregates Extraction, thousand tonnes

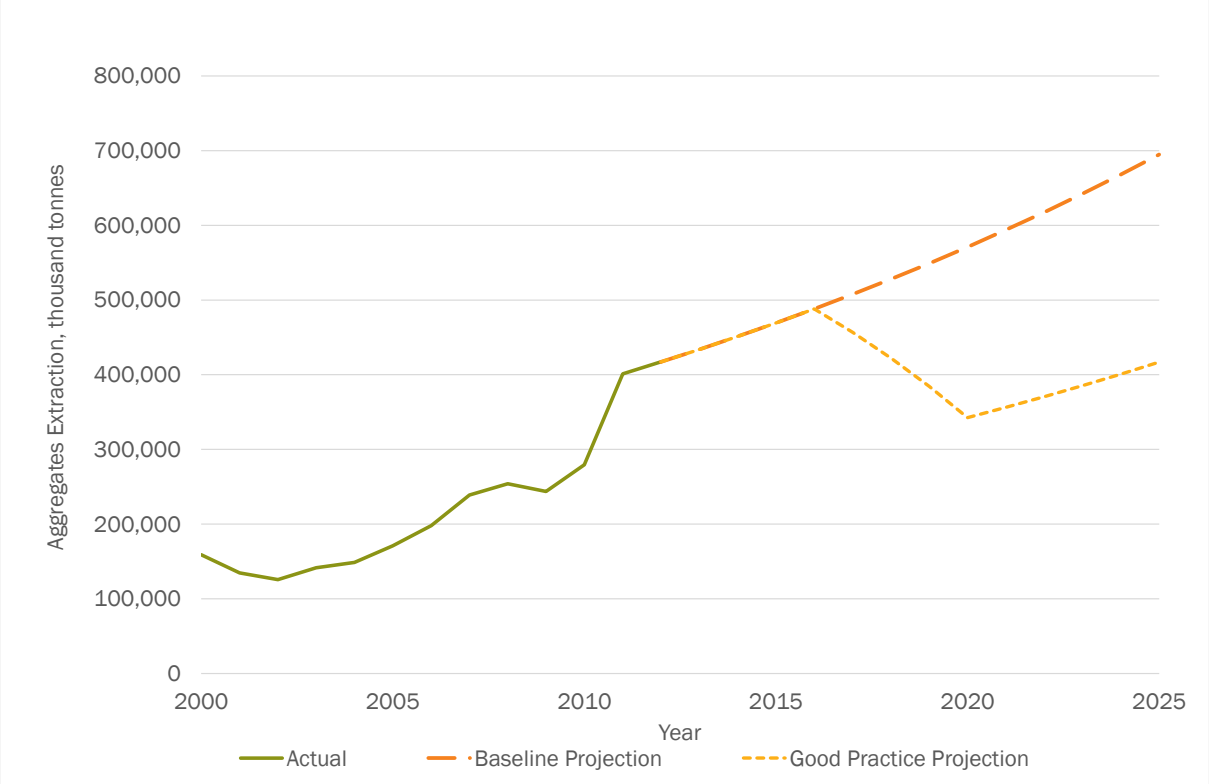


Figure 274: Change in Paper & Card Packaging Generation, thousand tonnes

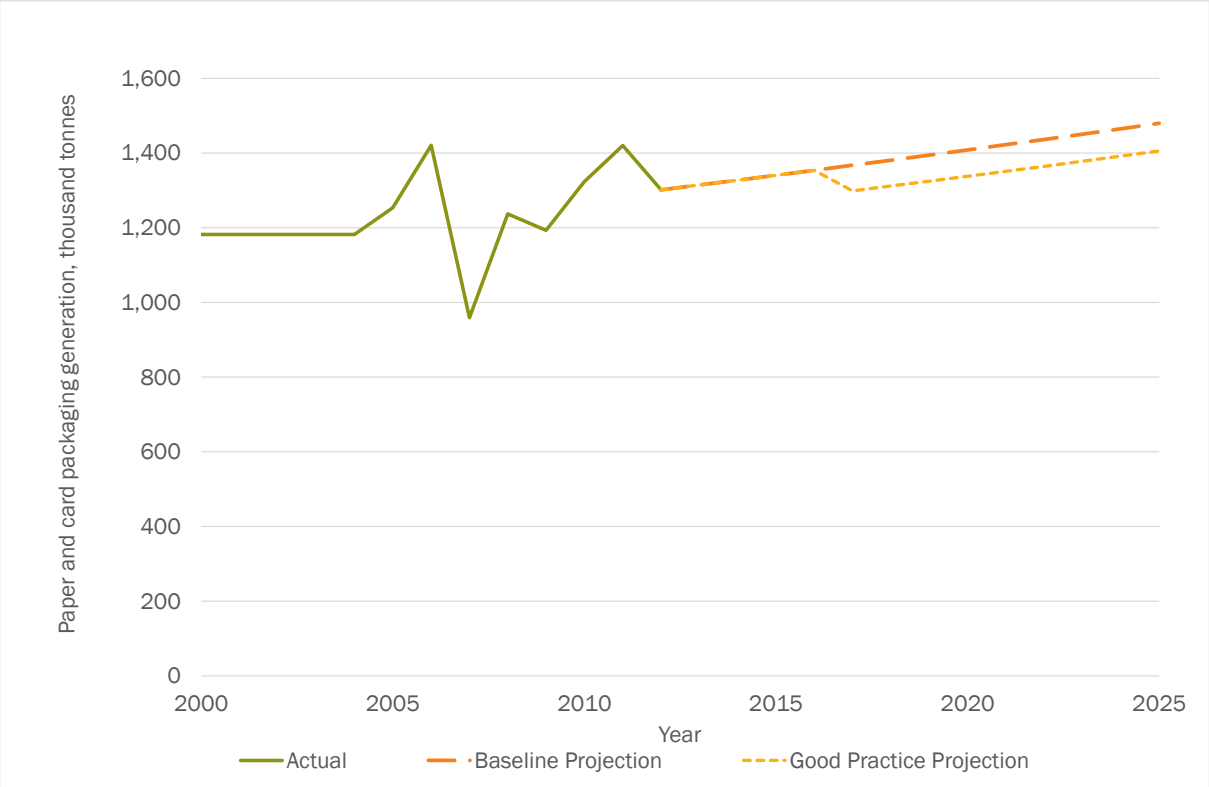


Figure 275: Change in Plastic Packaging Generation, thousand tonnes

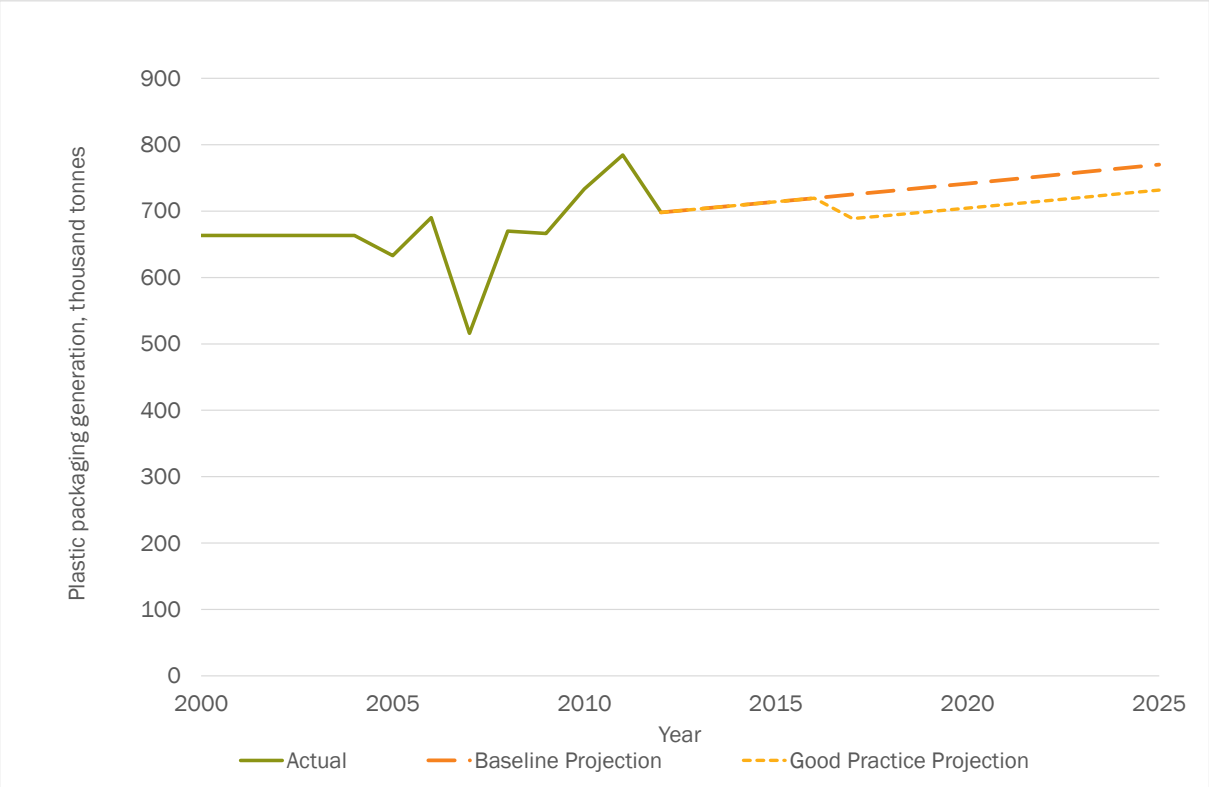


Figure 276: Change in Wood Packaging Generation, thousand tonnes

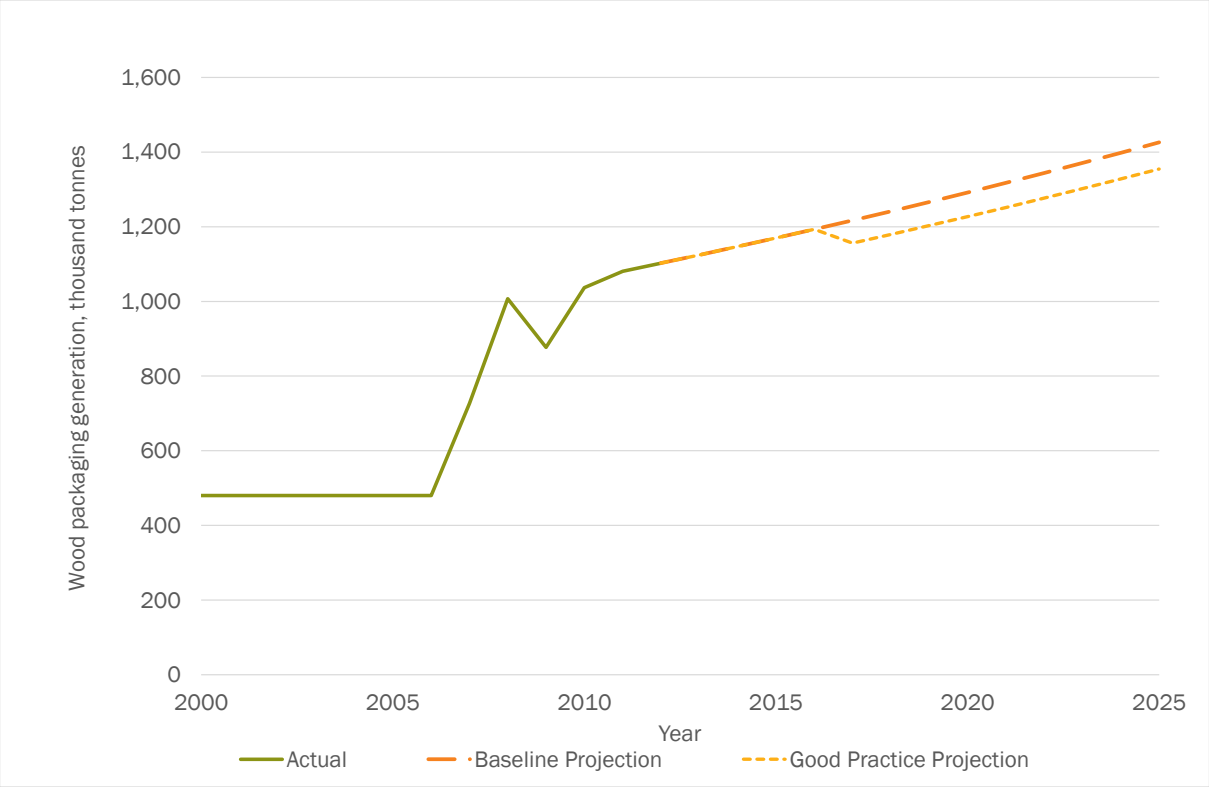


Figure 277: Change in Metal Packaging Generation, thousand tonnes

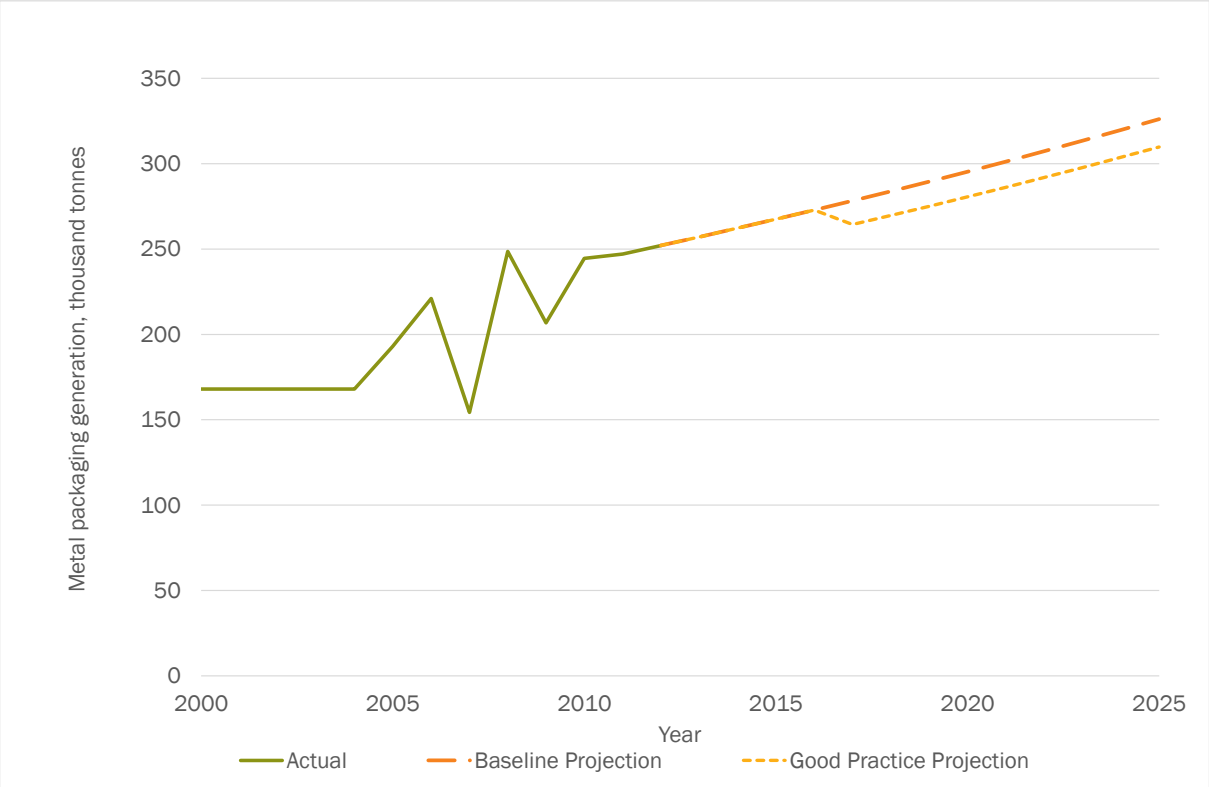


Figure 278: Change in Glass Packaging Generation, thousand tonnes

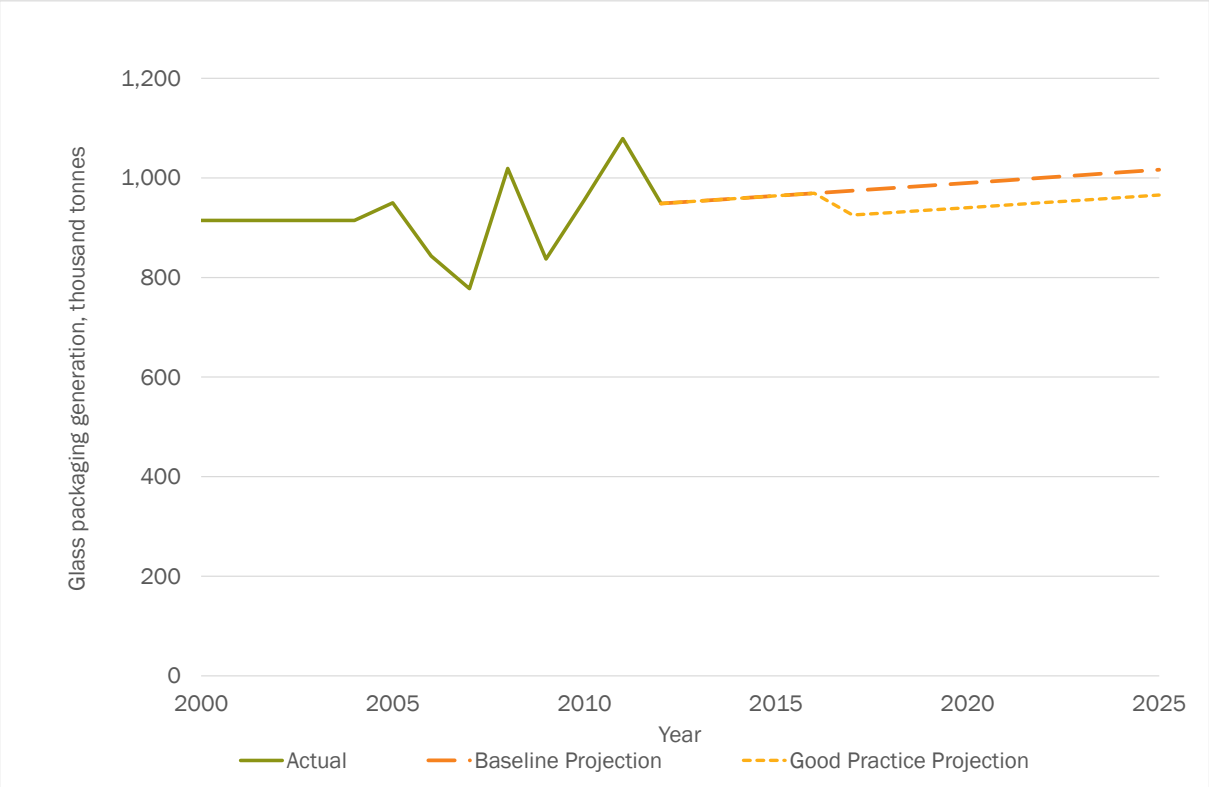
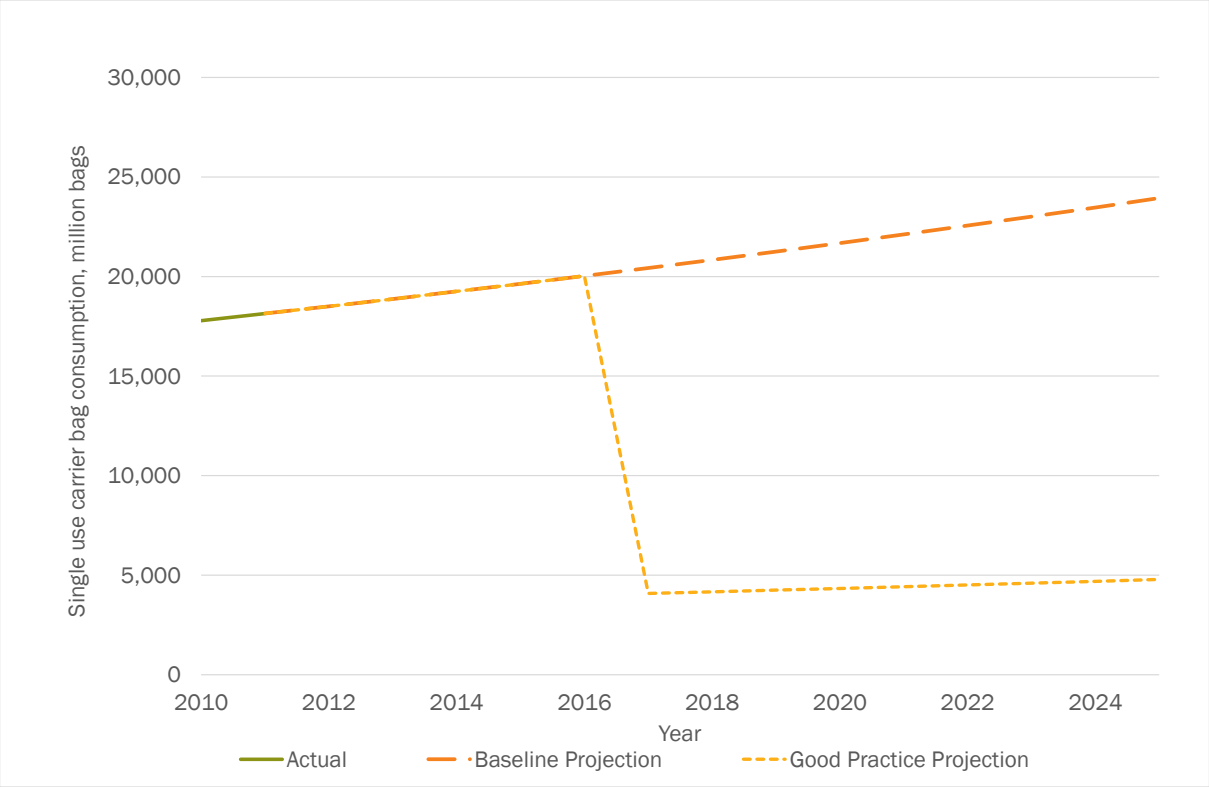


Figure 279: Change in Consumption of Single Use Carrier Bags, million bags



A.14.4 Full Revenue Outputs

Table 225: Revenue Outturns from Model, million PLN (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	649	1,287	1,915	2,536	3,148	3,754	4,352	4,945	4,945	4,945
	C&I / Heating	0	0	1,086	2,107	3,072	3,089	3,105	3,121	3,137	3,153	3,153	3,153
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million PLN	*0*	*0*	*1,735*	*3,394*	*4,988*	*5,624*	*6,253*	*6,874*	*7,489*	*8,098*	*8,098*	*8,098*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.2%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.4%*	*0.4%*	*0.4%*	*0.4%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	1,518	3,080	4,688	6,342	8,510	8,757	9,011	9,272	9,541	9,817
	Passenger Aviation Tax	0	0	1,351	2,692	2,757	2,822	2,887	2,953	3,018	3,084	3,149	3,215
	Freight Aviation Tax	0	0	0.22	0.45	0.47	0.49	0.50	0.52	0.54	0.56	0.58	0.60
	Sub-total Transport, million PLN	*0*	*0*	*2,869*	*5,773*	*7,445*	*9,164*	*11,398*	*11,710*	*12,029*	*12,356*	*12,691*	*13,033*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.3%*	*0.4%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	698	1,308	1,852	1,828	1,804	1,779	1,783	1,787	1,790	1,793	1,796

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	1	2	2	2	2	1	1	1	1	1	1
	Incineration /MBT Tax	0	192	378	559	558	558	558	557	557	557	557	556
	Air Pollution Tax	0	817	1,501	2,066	2,524	2,885	2,634	2,526	2,423	2,326	2,233	2,145
	Water Abstraction Tax	0	285	554	808	1,047	1,272	1,236	1,228	1,220	1,212	1,205	1,197
	Waste Water Tax	0	30	58	84	81	81	81	81	81	81	81	81
	Pesticides Tax	0	0	219	443	449	467	486	505	526	547	569	591
	Aggregates Tax	0	0	4,892	4,579	4,233	3,852	3,434	3,571	3,714	3,863	4,017	4,178
	Packaging Tax	0	0	539	518	524	530	536	542	549	555	562	568
	Single Use Bag Tax	0	1,193	1,217	248	253	258	263	269	274	280	285	291
	Fertiliser Tax	0	0	0	1	1	1	1	1	1	1	1	1
	Sub-total Pollution & Resource, million PLN	*0*	*3,215*	*10,667*	*11,159*	*11,500*	*11,710*	*11,009*	*11,065*	*11,132*	*11,212*	*11,303*	*11,406*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.2%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*
	Total, million PLN	0	3,215	15,271	20,326	23,933	26,498	28,660	29,649	30,651	31,666	32,092	32,537

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.2%	0.9%	1.1%	1.3%	1.4%	1.5%	1.5%	1.5%	1.5%	1.4%	1.4%

A.15.0 Romania: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

Romania operates an Environmental Fund which is fully self-financed from the earmarking of various environmental taxes and charges. Those taxes that are earmarked for the Environmental Fund are listed below:

- Vehicle registration tax;
- Tax on emissions of air pollutants from stationary sources;
- Tax on waste sent to landfill;
- Tax on the storage of waste;
- Tax on packaging;
- Tax on tyres;
- Tax on waste oil;
- Tax on plastic bags; and
- Tax on ferrous and ferrous scrap metal;
- Substances classed as being dangerous to the environment; and 9
- Tax on timber.

The information below is mainly from the European Commission's Tax-UD database[927] and Fiscal Code of Romania documentation[928] as well as the Environment Fund Administration with some additional expert information.

A.15.1 Energy Taxes

- Excise duty on energy products and electricity
  - Tax rates (2013) are shown in Table 226.[929]
  - Main Exemptions include:
    - The energy products used for any purposes other than as motor fuel or heating fuel;
    - Energy products and electricity used for the production of electricity; and
    - Electricity generated by renewable energy sources.
  - In 2011 this tax generated revenue of €2.25 billion (RON 9.54 billion), equivalent to 1.71% of GDP. [930]

Table 226: Excise Duty Rates on Energy Products and Electricity (Romania, 2013)

General tax base	Specific tax base	Tax rate	
		RON	EUR
Petrol (per 1,000 litres)	Leaded	1904.75	431.04
	Unleaded	1626.17	368.00
Gas oil (per 1,000 litres)	Propellant use	1494.14	338.12
	Industrial/Commercial use	1494.14	338.12
	Heating - Business use	1494.14	338.12
	Heating - Non-business use	1494.14	338.12
	Propellant use	1699.98	384.70

[927] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[928] Fiscal Code of Romania (Law no.571/2003), Chapter III Tax on Oil and Natural gas from Domestic Production, Accessed 13th January, http://www.dsclex.ro/english/law/law571_2003.htm

[929] European Commission - Taxation and Customs Union (2013) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2013

[930] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

General tax base	Specific tax base	Tax rate	
		RON	EUR
Kerosene (per 1,000 litres)	Industrial/Commercial use	1699.98	384.70
	Heating - Business use	1699.98	384.70
	Heating - Non-business use	1699.98	384.70
Heavy fuel oil (per 1,000 kg)	Heating - Business use	67.83	15.35
	Heating - Non-business use	67.83	15.35
Liquid Petroleum Gas (LPG) (per 1,000 kg)	Propellant use	580.03	131.26
	Industrial/Commercial use	580.03	131.26
	Heating - Business use	513.28	116.15
	Heating - Non-business use	513.28	116.15
Natural Gas (per gigajoule)	Propellant use	11.76	2.66
	Industrial/Commercial use	11.76	2.66
	Heating - Business use	0.77	0.17
	Heating - Non-business use	1.45	0.33
Coal (per gigajoule)	Heating - Business use	0.68	0.15
	Heating - Non-business use	1.36	0.31
Coke (per gigajoule)	Heating - Business use	0.68	0.15
	Heating - Non-business use	1.36	0.31
Lignite (per gigajoule)	Heating - Business use	0.68	0.15
	Heating - Non-business use	1,36	30.78
Electricity (per MWh)	Business use	2.26	0.51
	Non-business use	4.52	1.02

- Excise duty on oil and gas from domestic production
  - Oil production is taxed at a rate of €4 per ton (2013). [931]
    - This generated revenue of €2.26 million in 2011 (RON 9.58 million), equivalent to 0.0016% of GDP. [932]

[931] Fiscal Code of Romania (Law no.571/2003), Chapter III Tax on Oil and Natural gas from Domestic Production, Accessed 13th January 2014, http://www.dsclex.ro/english/law/law571_2003.htm

[932] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Natural gas production is taxed at a rate of €7.40 per 1000 m^3. [933]

A.15.2 Transport (excl. transport fuels)

- Registration:
  - Vehicle registration tax (or 'environmental stamp'). This is based upon a formula that takes into account four components:[934]
    - CO_2 emissions;
    - Engine cylinder capacity;
    - Pollution norms; and
    - Age of vehicle.
  - This tax generated revenue of €80.76 million in 2013 (RON 365.26 million), equivalent to 0.057% of GDP. [935]
- Circulation:
  - Circulation taxes on motor vehicles, heavy vehicles, trailers and water vehicles generated revenue of €223.9 million in 2011 (949.13 million RON), equivalent to 0.17% of GDP. [936]
  - Motor vehicles tax:
    - Tax rates (2012) are shown in Table 227 and are based on the fraction of engine cylinder capacity.[937]
    - Key exemptions include:
      - Cars, motorcycles with sidecars, and motorized tricycles that belong to persons with locomotive disabilities and that are adapted for such disability; and
      - Means of transport of public institutions.

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[933] Fiscal Code of Romania (Law no.571/2003), Chapter III Tax on Oil and Natural gas from Domestic Production, Accessed 13th January, http://www.dsclex.ro/english/law/law571_2003.htm

[934] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[935] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[936] European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

[937] Romania Ministry of Public Finance, Fiscal Code, Updated 2012, Accessed 12th January 2014, http://discutii.mfinante.ro/static/10/Mfp/legislatie/cod/cod_fiscal_2012.pdf, TITLUL IX p.14

Table 227: Motor vehicle tax rates (Romania, 2012)

Vehicle	Tax rate (per 200cm³ per year)	
	RON	EUR
Mopeds, scooters, motorcycles and cars with a capacity of up to 1600 cm³	36.18	8.19
Cars with a capacity between 1601 cm³ and 2000 cm³	81.40	18.42
Cars with a capacity between 2001 cm³ and 2600 cm³	325.61	73.68
Cars with a capacity between 2601 cm³ and 3000 cm³	651.21	147.37
Cars with a capacity exceeding 3001cm³	1130.58	255.85
Buses, coaches and minibuses	108.54	24.56
Other mechanical drive vehicles with a total weight of up to 12 tons	135.67	30.70
Registered tractors	81.40	18.42

- Tax on heavy vehicles:
  - Tax rates (2012) are shown in Table 228.[938]

Table 228: Tax Rates for Heavy Vehicles (Romania, 2012)

Category of vehicle	Maximum authorised weight (tonnes)	Tax rate (RON per year)		Tax rate (EUR per year)	
		Air or equivalent suspension	Other type of suspension	Air or equivalent suspension	Other type of suspension
2+1 axles	12 – 14	0	0	0	0
	14 – 16	0	0	0	0
	16 – 18	0	60	0	14
	18 – 20	60	137	14	31
	20 – 22	137	320	31	72
	22 – 23	320	414	72	94

[938] Romania Ministry of Public Finance, Fiscal Code, Updated 2012, Accessed 12th January 2014 http://discutii.mfinante.ro/static/10/Mfp/legislatie/cod/cod_fiscal_2012.pdf, TITLUL IX p.16

Category of vehicle	Maximum authorised weight (tonnes)	Tax rate (RON per year)		Tax rate (EUR per year)	
		Air or equivalent suspension	Other type of suspension	Air or equivalent suspension	Other type of suspension
	23 – 25	414	747	94	169
	25 – 28	747	1310	169	296
	28 and above	747	1310	169	296
2+2 axles	23 – 25	128	299	29	68
	25 – 26	299	491	68	111
	26 – 28	491	721	111	163
	28 – 29	721	871	163	197
	29 – 31	871	1429	197	323
	31 – 33	1429	1984	323	449
	33 – 36	1984	3012	449	682
	36 – 38	1984	3012	449	682
	38 and above	1984	3012	449	682
2+3 axles	36 – 38	1579	2197	357	497
	38 – 40	2197	2986	497	676
	40 and above	2197	2986	497	676
3+2 axles	36 – 38	1395	1937	316	438
	38 – 40	1937	2679	438	606
	40 – 44	2679	3963	606	897
	44 and above	3679	3963	833	897
3+3 or more axles	36 – 38	794	960	180	217
	38 – 40	960	1434	217	325
	40 – 44	1434	2283	325	517
	44 and above	1434	2283	325	517

- Tax on trailers:

- Tax rates (2012) are shown in Table 229. [939]

Table 229: Tax Rates for Trailers (Romania, 2012)

Maximum allowable weight (tonnes)	Tax rate (per year)	
	RON	EUR
Less than 1	8	2
1 – 3	29	7
3 – 5	45	10
5 and above	55	12

- Water vehicles tax:
  - Tax rates (2012) are shown in Table 230. [940]

Table 230: Tax Rates for Water Vehicles (Romania, 2012)

Type of water vehicle	Tax rate (per year)	
	RON	EUR
Boats without motors used for fishing and personal purposes	18	4
Boats without motors used for other purposes	48	11
Motor boats	181	41
Sports and leisure boats	0 – 964	0 – 218
Water scooters	181	41
Tug boats		
a) Up to 500 HP	482	109
b) 500 – 2000 HP	783	177
c) 2000 – 4000 HP	1205	273

[939] Romania Ministry of Public Finance, Fiscal Code, Updated 2012, Accessed 12 January 2014 http://discutii.mfinante.ro/static/10/Mfp/legislatie/cod/cod_fiscal_2012.pdf, TITLUL IX p.18

[940] Romania Ministry of Public Finance, Fiscal Code, Updated 2012, Accessed 12 January 2014 http://discutii.mfinante.ro/static/10/Mfp/legislatie/cod/cod_fiscal_2012.pdf, TITLUL IX pp.18-19

Type of water vehicle	Tax rate (per year)	
	RON	EUR
d) Above 4000 HP	1928	436
Boats – 1,000 deadweight tonnes	157	36
Barges		
a) Capacity of up to 1500 tons	157	36
b) Capacity of 1500 – 3000 tons	241	55
c) Capacity of above 3000tons	422	95

A.15.3 Pollution and Resources

- A tax on the exploitation of natural resources was approved by the Romania government in January 2013 as part of Government Ordinance no. 6/2013 (subsequently amended in October 2013 under Government Ordinance 262/2013). Under this law all revenues from the exploitation of natural resources, other than gas, are taxed at a rate of 0.5% (companies are also required to pay the tax on resources which had been exploited prior to 1st February 2013, but had not yet been sold). The tax will be in place until the 31st December 2014. The tax applies to the production and/or processing of crude oil, superior quality coal, low quality coal, uranium, thorium and other extractive activities. Revenues derived from the tax are reportedly meant for co-financing 'ongoing investment projects', although no specific projects or sectors have been named. Given the recent introduction of this tax there is currently no precise figure on the revenue derived from it.[941,942,943] At the same time the Finance Ministry announced a surcharge of 60% on excess revenues received as a result of deregulation of the natural gas market (originally announced in Government Ordinance no. 7/2013). This tax was introduced on the 1st February 2013 and as with the resource tax will be in place until the 31st December 2014.

  The excess revenue tax is calculated according to the following formula:

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[941] Deloitte (2013) *Tax and Legal Weekly Alert: 14 – 18 October 2013*, http://www.deloitte.com/view/en_RO/ro/services/deloitte-legal/8d41d5f486bc1410VgnVCM3000003456f70aRCRD.htm#, p. 2

[942] Romania Energy Centre 92013) *Romania's Oil and Gas Framework*, Policy Brief No. 2, March 2013, http://www.roec.ro/romanias-og-framework/, p. 4

[943] PWC (2013) *Tax on Exploitation of Mineral Resources, Other Than Natural Gas*, Published on 9th October 2013, Accessed 23rd January 2014, www.pwc.ro/en/tax-online/tax-and-legal-alerts/exploitation-of-min-resources.jhtml

$= 0.6 \times (excess\ revenue - royalty \times excess\ revenue - upstream\ investments)$

where the upstream investments that can be deducted cannot exceed 30% of the excess revenue.[944]

- Tax on emissions of air pollutants from stationary sources:
  - Tax rates (2013) are shown in Table 231. [945]
  - This tax generated revenue of €2.87million in 2013 (13 million RON), equivalent to 0.002% of GDP.[946]

Table 231: Tax rates on air pollution (Romania, 2013)

Pollutant	Tax rate (per tonne)	
	RON	EUR
NOx	40	9
POPs	20,000	4,526
SOx	40	9
Dust	20	5
Heavy metals		
Cadmium	16,000	3,621
Lead	12,000	2,716
Mercury	20,000	4,526

- Tax on water pollution:
  - The 2011 tax rates for selected pollutants are shown in Table 232.[947]

Table 232: Tax Rates for Water Pollution (Romania, 2011)

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[944] Romania Energy Centre 92013) *Romania's Oil and Gas Framework*, Policy Brief No. 2, March 2013, http://www.roec.ro/romanias-og-framework/, p. 4

[945] Emergency Ordinance no. 196 of 22 December 2005 Environmental Fun 9, Anex 1, , Updated September 2013, Accessed 14 January 2014, http://afm.ro/main/legislatie_sus/oug_196_2005.pdf

[946] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[947] See Table 5.3 in United Nations Economic Commission for Europe (2012) *Environmental Performance Reviews: Romania, second review*

Pollutant	Tax rate (per tonne)	
	RON	EUR
BOD5	46.5	10.5
COD	46.5	10.5
Ammonium/ nitrogen	186.1	42.1
Arsenic	36,196.1	8191.0
Cyanides	36,196.1	8191.0
Filterable residuum	42.4	9.6
Detergents (biodegradable)	186.1	42.1
Nitrates	46.7	10.6
Phenols/sulphites	186.1	42.1
Phosphates	9.2	2.1
Potassium	46.7	10.6
Chlorine/magnesium	46.7	10.6
Sulphates/chloride	46.7	10.6
Suspended solids	11.4	2.6

- Tax on waste sent to landfill:
  - Since 2010, a target was introduced to reduce the amount of municipal waste sent to landfill by 15% per year. In case of failure, local authorities pay €22.1 per tonne on the difference between the target established and the target achieved. In this sense, it is not a traditional landfill tax.[948,949]

[948] United Nations Economic Commission for Europe (2012) *Environmental Performance Reviews: Romania, second review*, p.73.

[949] Information obtained with private communication with Ştefan cel Mare University, data sourced from the Official Journal of Romania.

- A landfill tax is due to come into effect for inert and non-hazardous waste at a charge of RON 50 (€11) per tonne in 2014, RON 80 (€18.10) per tonne in 2015 and at RON 120 (€27.16) thereafter (2013 prices). [950]

➢ Tax on the storage of waste:

- Collected from landfill operators who use correspondingly reclassified new land for storage of recyclable waste.
- Tax rates (2013) are shown in Table 233. [951]
- This generated revenue of €8,000 in 2013 (RON 36,178), equivalent to 0.00001% of GDP.[952]

Table 233: Tax Rates for Storage of Waste (Romania, 2013)

Waste category	Tax rate (per m² pear year)	
	RON	EUR
Waste from alcohol production	0.20	0.05
Waste from oil extraction and processing	4.00	0.91
Waste from primary wood processing	1.20	0.27
Ashes from thermal power stations	4.00	0.91
Sludge	4.00	0.91
Blast furnace slag	4.00	0.91
Pyrite ashes	4.00	0.91
Phosphogypsum	4.00	0.91
Metallurgical slag	4.00	0.91

➢ Tax on packaging:

[950] Emergency Ordinance no. 196 of 22 December 2005 Environmental Fun 9, Anex 2, , Updated September 2013, Accessed 14th January 2014, http://afm.ro/main/legislatie_sus/oug_196_2005.pdf

[951] Emergency Ordinance no. 196 of 22 December 2005 Environmental Fun 9, Anex 2, , Updated September 2013, Accessed 14th January 2014, http://afm.ro/main/legislatie_sus/oug_196_2005.pdf

[952] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

- Taxed at a rate of RON 2 (€0.44) per kg (2013). [953]
- Payable by economic operators placing packaged goods on the national market.
- Only paid in the event that the economic operator fails to meet the official annual target for packaging waste recovery.
- Revenues from packaging waste taxes generated €11.54 million in 2013 (RON 52 million), equivalent to 0.008% of GDP. [954]

➢ Tax on tyres:
  - Taxed at a rate of RON 2 (€0.44) per kg (2013). [955]
  - Applied to vehicle tyres placed on the domestic market.
  - The tax is due only to the extent that the annual targets for recycling of used tyres are not achieved.
  - This tax generated revenue of €0.22 million 2013 (RON 1 million), equivalent to 0.00016% of GDP.[956]

➢ Tax on waste oil:
  - Taxed at a rate of RON 2 (€0.44) per kg (2013). [957]
  - Similarly to the tax on packaging and tax on tyres, this tax is only paid when waste oil recycling targets are not achieved.
  - This tax generated revenue of €3.32 million in 2013 (RON 15 million) equivalent to 0.0023% of GDP. [958]

➢ Tax on plastic bags:
  - Taxed at a rate of RON 0.1 (€0.023) per bag with handles (2013). [959]

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[953] Government of Romania (2013) *Amending and Supplementing Government Emergency Ordinance No 196/2005 regarding the Environmental Fund,* November 2013, p.4.

[954] United Nations Economic Commission for Europe (2012) *Environmental Performance Reviews: Romania, second review*, p.73.

[955] Government of Romania (2013) *Amending and Supplementing Government Emergency Ordinance No 196/2005 regarding the Environmental Fund,* November 2013, p.5.

[956] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[957] United Nations Economic Commission for Europe (2012) *Environmental Performance Reviews: Romania, second review*, p.73.

[958] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[959] Information obtained with private communication with Ştefan cel Mare University, data sourced from the Official Journal of Romania.

- Tax evasion is huge for this tax as there is no control on the number of bags produced or imported.
- This tax generated revenue of €4.86 million in 2013 (RON 22 million) (equivalent to 0.0034% of GDP). [960]

- Tax on ferrous and non-ferrous scrap metal:
  - Taxed at a rate of 3% tax of value of company sales of ferrous and non-ferrous scrap metal (2013). [961,962]
  - Applies to waste operators who are officially authorised to recover and collect scrap metal.
  - In 2013 revenue collected from this tax was €18.13 million (RON 82 million), equivalent to 0.013% of GDP. [963]
- Tax on dangerous substances:
  - A contribution of 2% of the substances classified by acts as dangerous for the environment, placed on national market by operators.
  - In 2013 revenue collected from this tax was €1.11 million (RON 5 million), equivalent to 0.0008% of GDP.[964]
- Tax on timber:
  - Tax rate (2013) is a contribution of 2% of the sales value of timber received by the administrators or owners of forests. [965,966]
  - Main exemptions include:
    - Christmas trees;

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[960] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[961] United Nations Economic Commission for Europe (2012) *Environmental Performance Reviews: Romania, second review*, p.73.

[962] Information obtained with private communication with Ştefan cel Mare University, data sourced from the Official Journal of Romania.

[963] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[964] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[965] United Nations Economic Commission for Europe (2012) *Environmental Performance Reviews: Romania, second review*, p.98.

[966] Information obtained with private communication with Ştefan cel Mare University, data sourced from the Official Journal of Romania.

    - Willows;
    - Seedlings;
    - Ornamental shrubs; and
    - Fuel wood.
  - The same percentage is also paid by the harvesting companies on what they sell (logs at the road side or lumber).
  - This tax generated revenue of €2.65 in 2013 (RON 12 million), equivalent to 0.0019% of GDP. [967]
- Water abstraction charges:
  - Tax rates (2011) are shown in Table 234. [968]
  - These are volumetric charges and are differentiated by water source.
- Water supply and wastewater charge:
  - Charge rates vary by region. This reflects differences in the cost of providing services, the level of technology installed and average income in the region.

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[967] Environment Fund Administration (2014) *Budget Revenues and Expenses of the Fund for Environment for 2013*, p.1. Accessed 13th January 2014, http://afm.ro/main/informatii_publice/bvc/2013/bvc_2013.pdf

[968] See Table 5.7 in United Nations Economic Commission for Europe (2012) Environmental *Performance Reviews: Romania, second review*, data sourced from GEO No. 107 (2002); GD No. 803 (2008); GD No. 522 (2009); GD No. 328 (2010); GD No. 1202 (2010).

Table 234: Water Abstraction Charges (Romania, 2011)

Source of Water	Tax rate (per 1,000 m³)	
	RON	EUR
Groundwater		
Public water supply	57.52	13.02
Industrial use	57.52	13.02
Agrozootechnical uses	57.52	13.02
Irrigation	57.52	13.02
Aquaculture	11.00	2.49
Surface Water (excl. Danube)		
Economic users and public institutions	50.0	11.31
Electric and thermal power production	24.0	5.43
Hydropower generation	1.10	0.25
Irrigation	3.00	0.68
Aquaculture	0.50	0.11
Surface water (inc. Danube)		
Economic users and public institutions	50.00	11.31
Electric and thermal energy production	24.00	5.43
Hydropower plants	1.10	0.25
Nuclear energy generation	24.00	5.43
Irrigation	3.00	0.68
Aquaculture	0.50	0.11

A.15.4 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 16.2.2, we list here a complete list of subsidies identified in Romania by the IEEP and by IVM for which financial information is not available:

Table 235: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
Fossil fuel energy transport infrastructure	IEEP	
Biofuel production	IEEP	€30-45/ha. approx. €80/t
Tractor-park renewal	IEEP	50% of cost of a new tractor
Railway transport company support	IEEP	
Agricultural waste tax exemption	IEEP	
Fuel subsidy for public transportation	IVM	

Sources: Table 5 in IEEP (2013) Steps to Greening Country Report: Romania, Report for the European Commission, p.10.

IVM Institute for Environmental Studies (2013) Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries, Final Report, 15 January 2013, pp.51-58. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

Full details of the energy balance sheet categories, fuel quantities and rates used in our methodology are presented in Table 173.

Table 236: Environmentally Harmful Subsidies – Calculated Revenues Forgone (2011) – Full Details

Subsidy	Source	Energy Balance Sheet Category	Energy Balance Sheet		ETD		Rates		Revenue Forgone in 2011 (RON million, nominal)
			Fuel Quantity (2011)	Unit	Fuel Quantity	Unit	Normal rate (€)	Subsidy Rate (€)	
Excise tax exemption for LPG used for heating (households)	TAXUD	LPG – Other Sectors - Households	199	1000t	199000	1000kg	113.5	0	96
Excise tax exemption for natural gas used for heating (households)	TAXUD	Natural Gas – Other Sectors - Households	108,483	TJ (GCV)	1.1E+08	GJ	0.32	0	147
Excise tax exemption for coal and coke used for heating (households)	TAXUD	Hard Coal + Coke + Lignite – Other Sectors - Households	108	1000t	2.8E+07	GJ	0.3	0	35
Excise tax exemption for petroleum products used as fuel for (domestic) commercial aviation	IVM	Motor Spirit – Transport – Domestic Aviation	5	1000t	6666.67	1000l	359.59	0	10
	IVM	Kerosenes, jet fuels – Transport – Domestic Aviation	111	1000t	137037	1000l	375.91	0	218
Excise tax exemption for fuels used for internal waterway transportation	IVM	Gas/diesel oil – Transport – Domestic Navigation	51	1000t	61445.8	1000l	330.4	0	86
Fuel Subsidies for Railways	IVM	Gas/diesel oil – Transport – Railways	193	1000t	232530	1000l	330.4	0	326

Sources: Source: Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

IVM Institute for Environmental Studies (2013) Budgetary Support and Tax Expenditures for Fossil Fuels: An inventory for six non-OECD EU countries, Final Report, 15 January 2013, pp.51-58. Accessed 28th January http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

Eurostat (2013) *Energy Balance Sheets 2010-11,* 2013, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EN-13-001/EN/KS-EN-13-001-EN.PDF

A.15.5 Change in Tax Bases

Table 237: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	3,980	3,929	-51
Petrol	million litres	1,589	1,589	0
Kerosene	million litres	232	232	0
LPG	thousand tonnes	209	198	-11
Heavy Fuel Oil	thousand tonnes	53	51	-2
Natural Gas	TJ (GCV)	381,859	346,828	-35,031
Coal	thousand tonnes	1,767	1,514	-253
Electricity	GWh	41,527	41,491	-35

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[969] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[969] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 280: Change in Internal Passenger Flights, flights per year

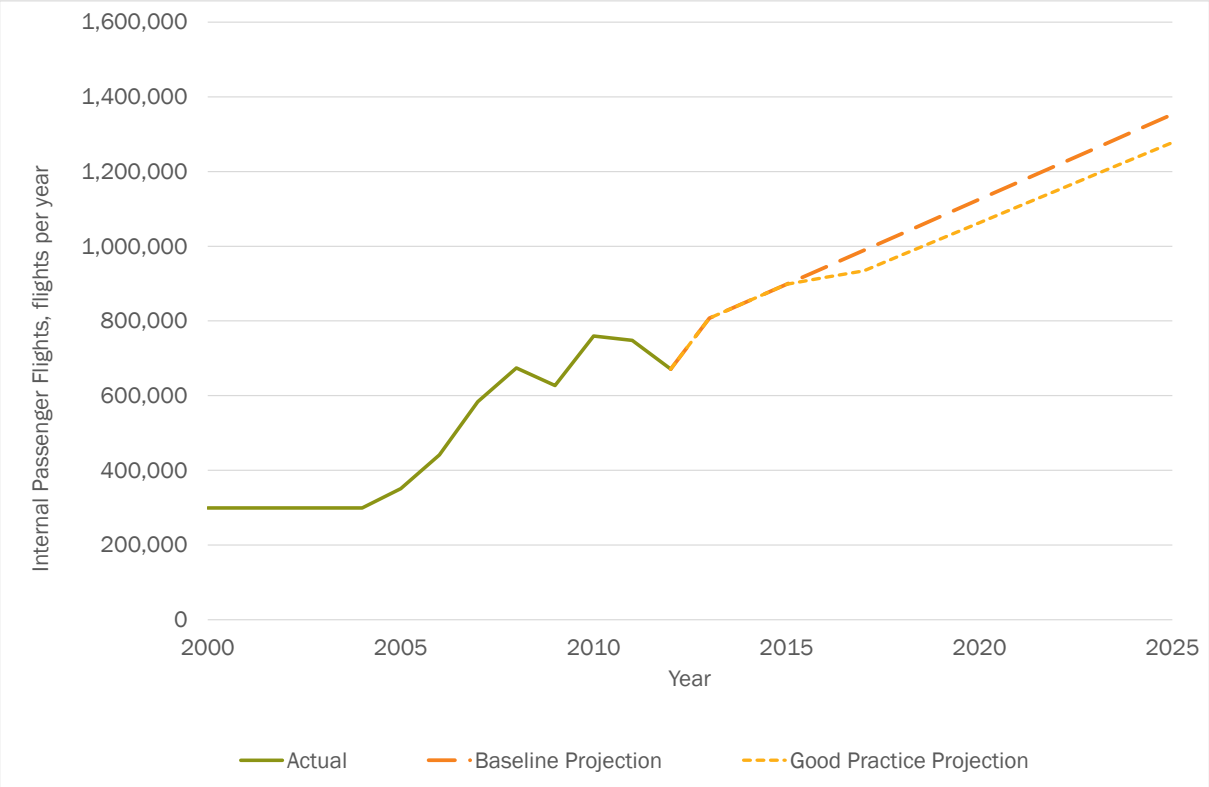


Figure 281: Change in Intra-EU Passenger Flights, flights per year

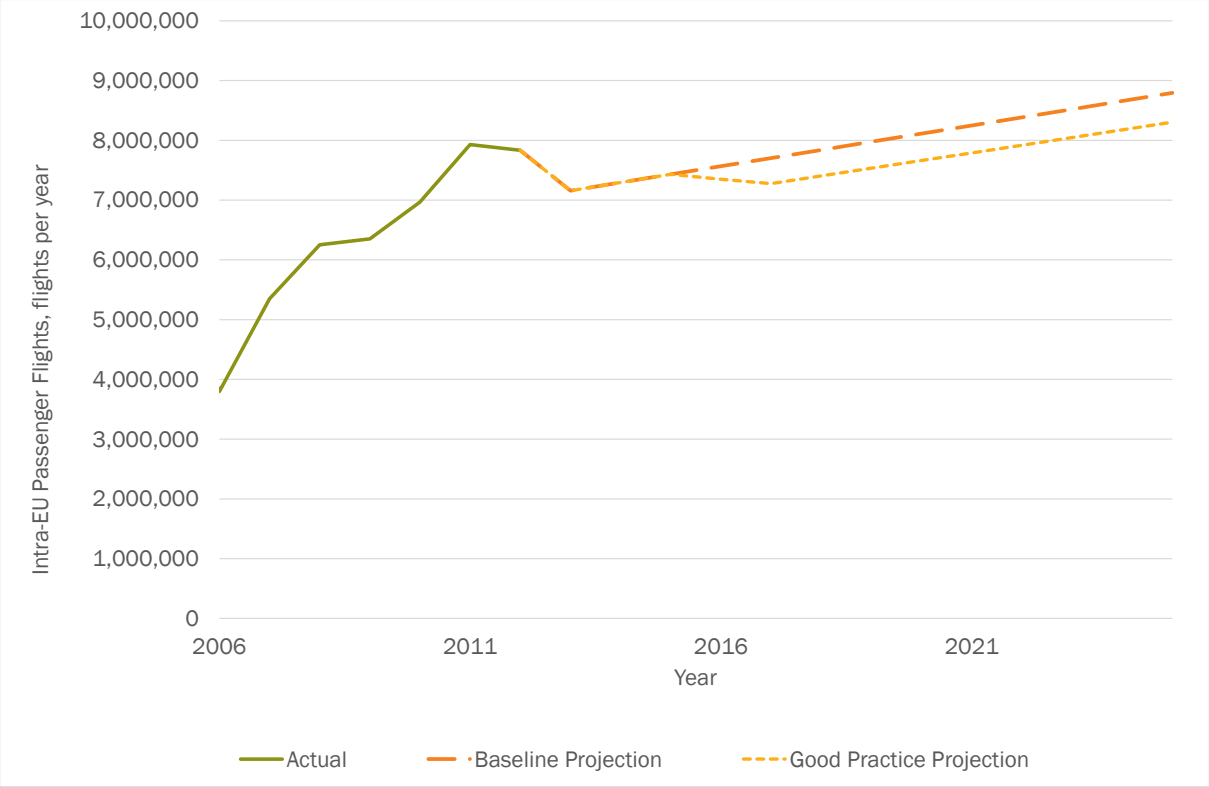


Figure 282: Change in Extra-EU Passenger Flights, flights per year

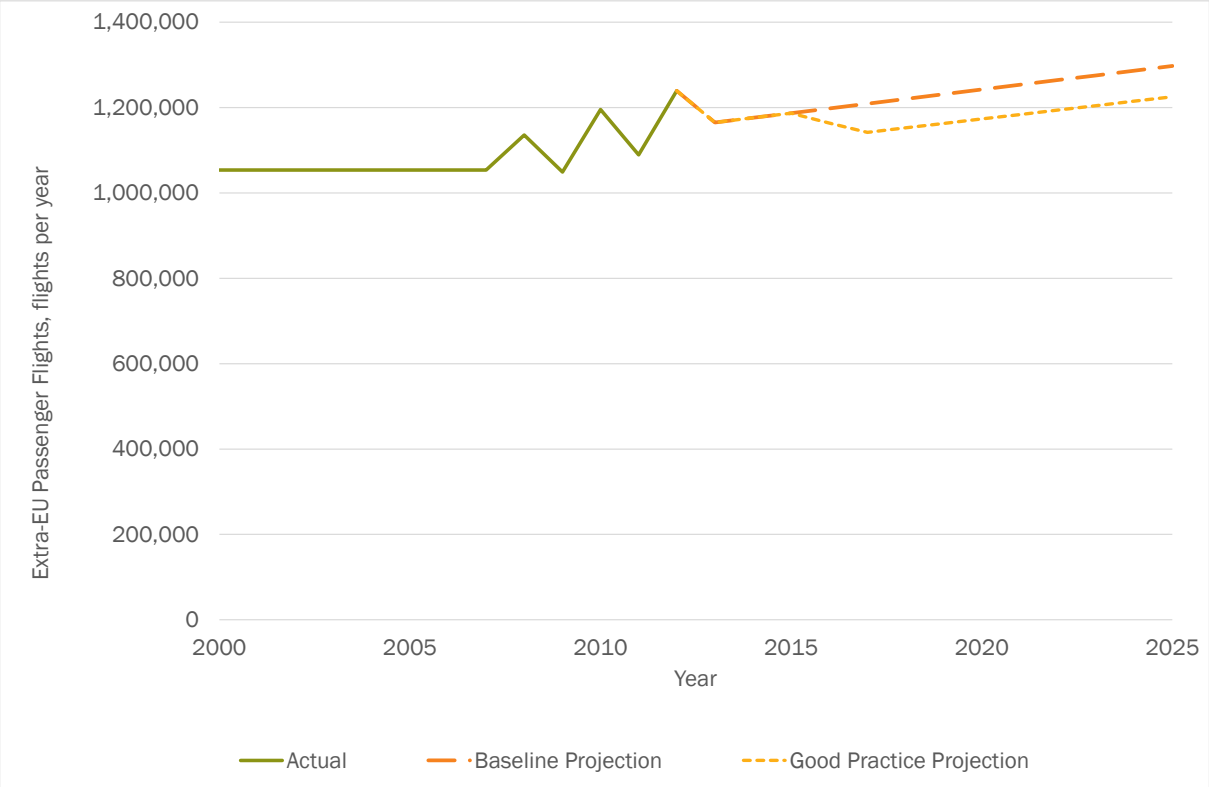


Figure 283: Change in Internal Air-freight, tonnes

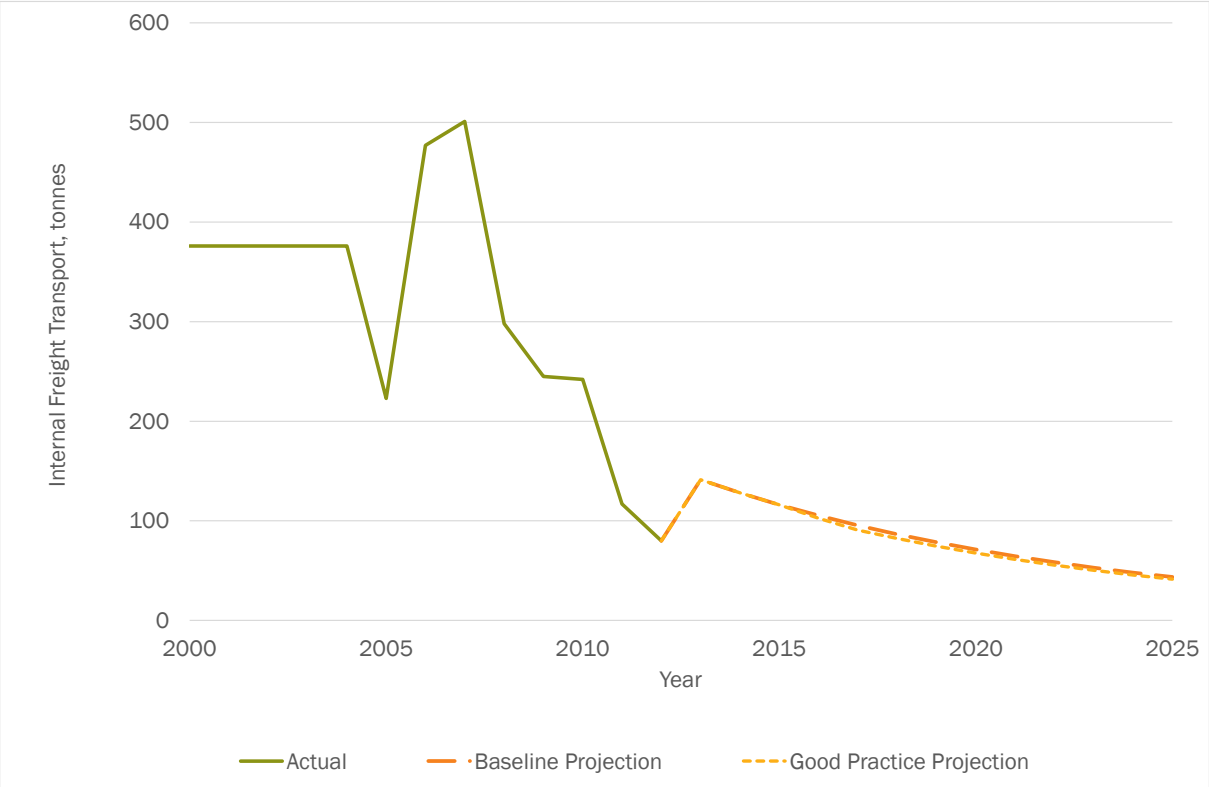


Figure 284: Change in Intra-EU Air-freight, tonnes

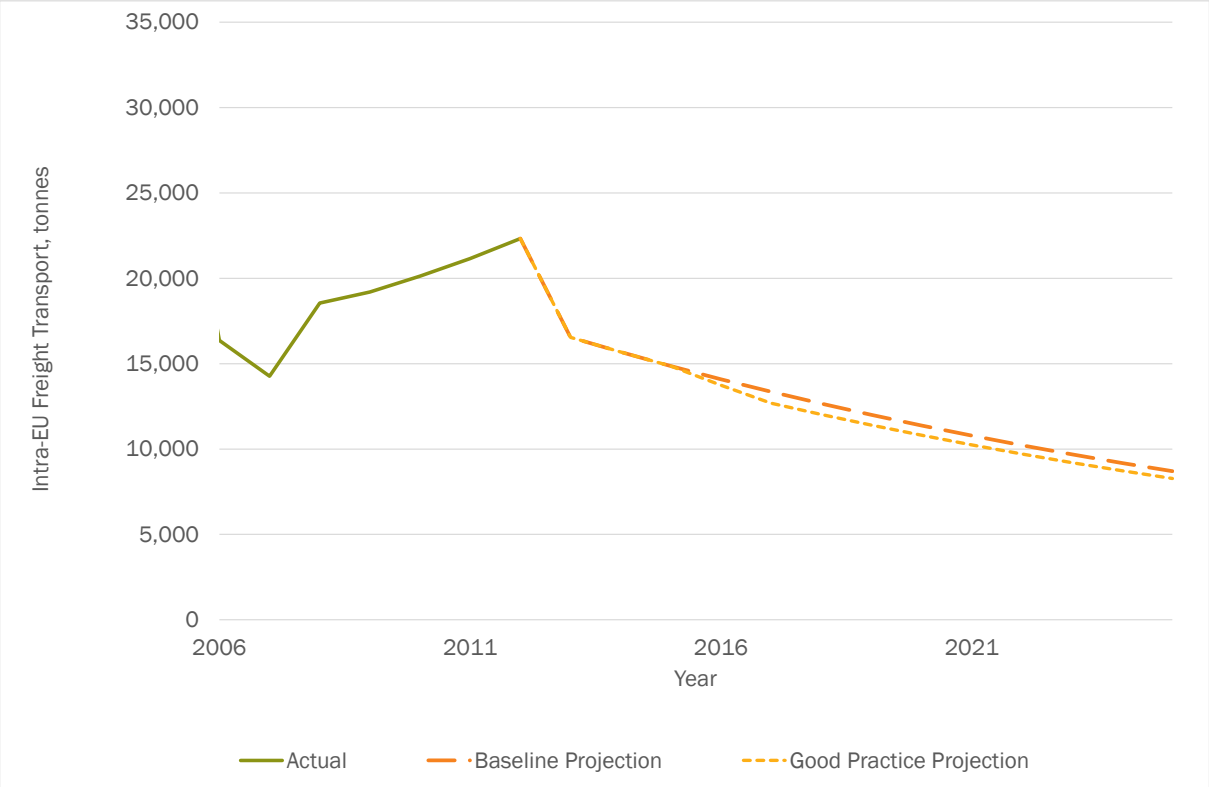


Figure 285: Change in Extra-EU Air-freight, tonnes

Figure 286: Change in Non-Hazardous Waste Landfilled, thousand tonnes

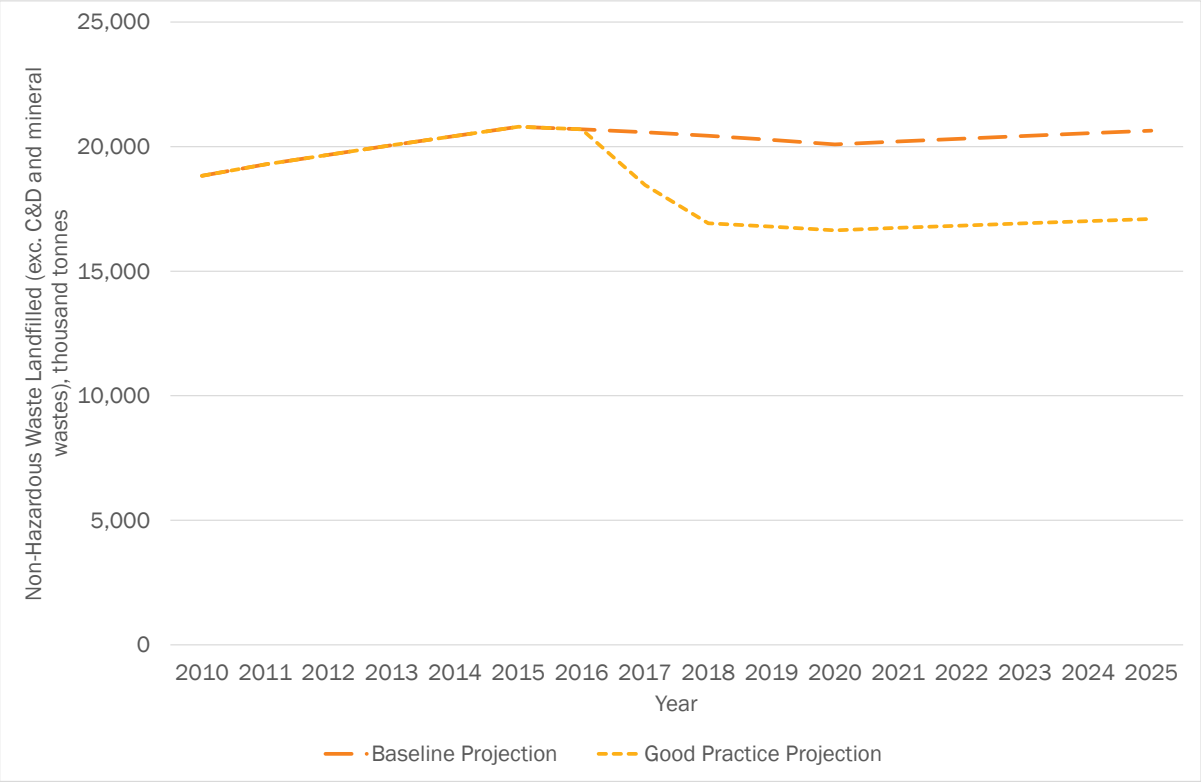


Figure 287: Change in MBT/ Incineration, thousand tonnes

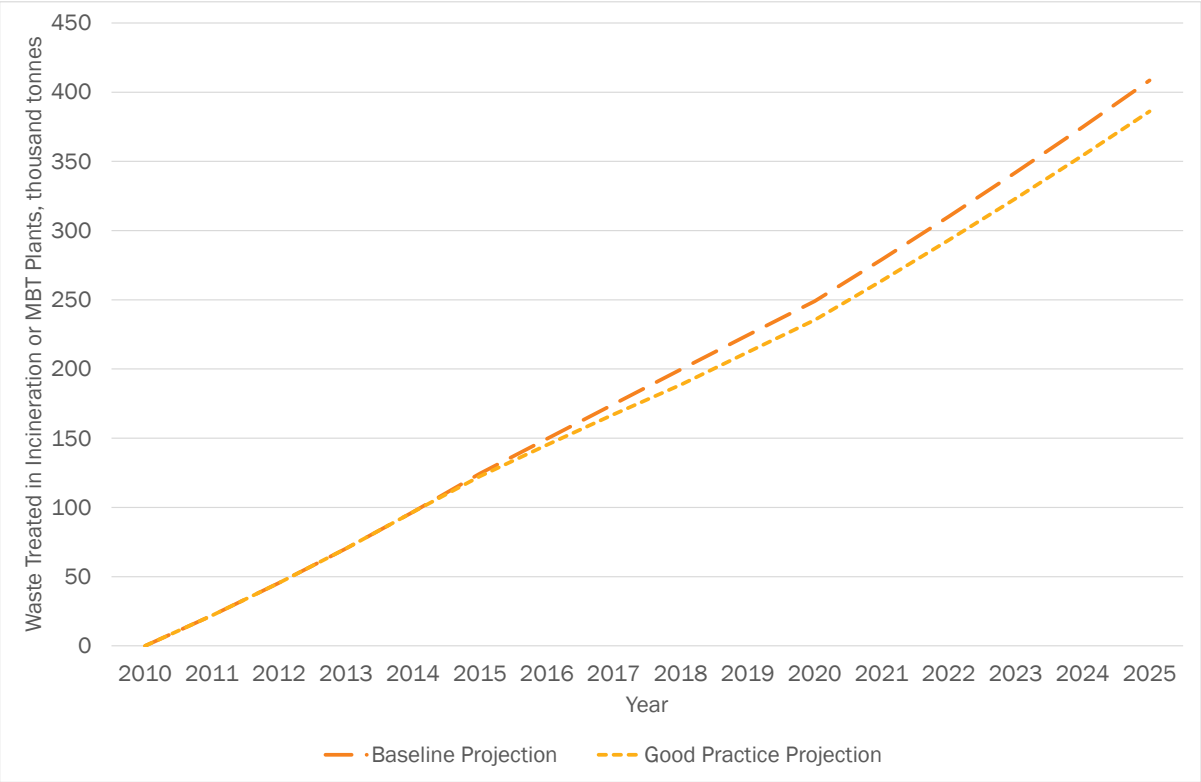


Figure 288: Change in SOx Emissions, tonnes

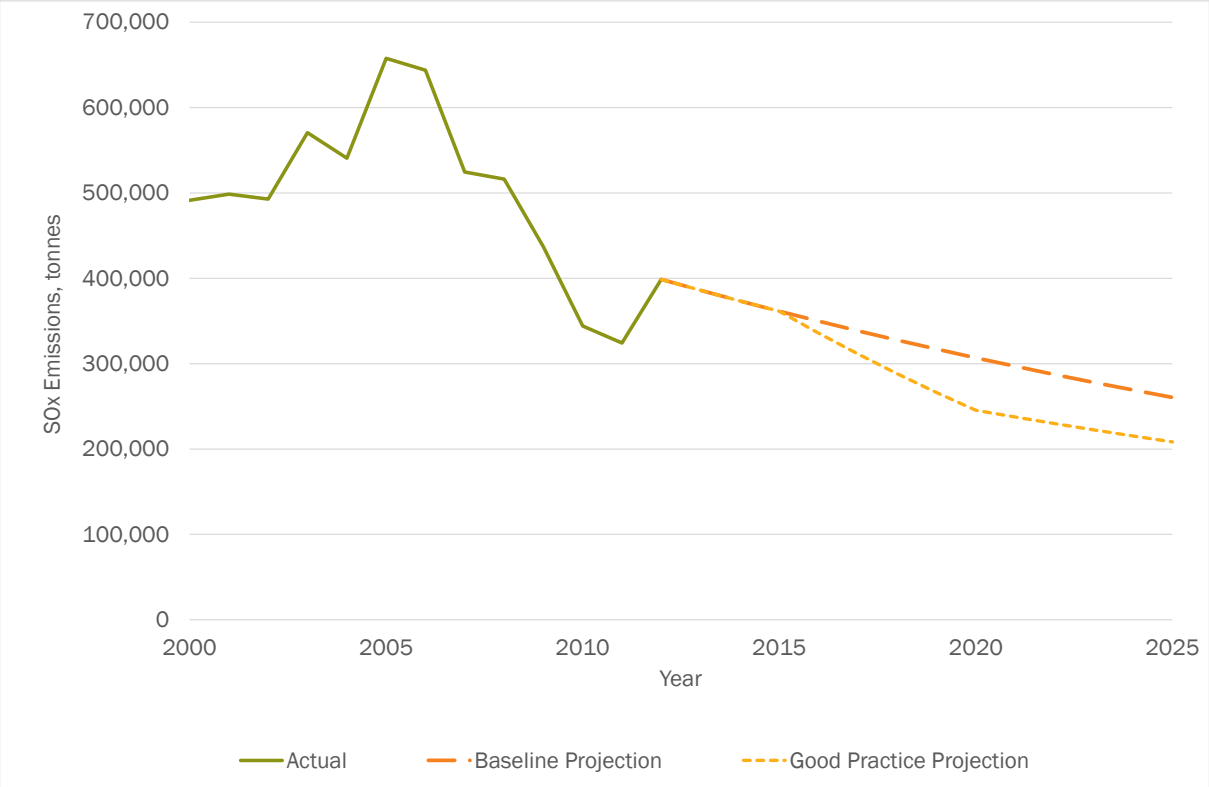


Figure 289: Change in NOx Emissions, tonnes

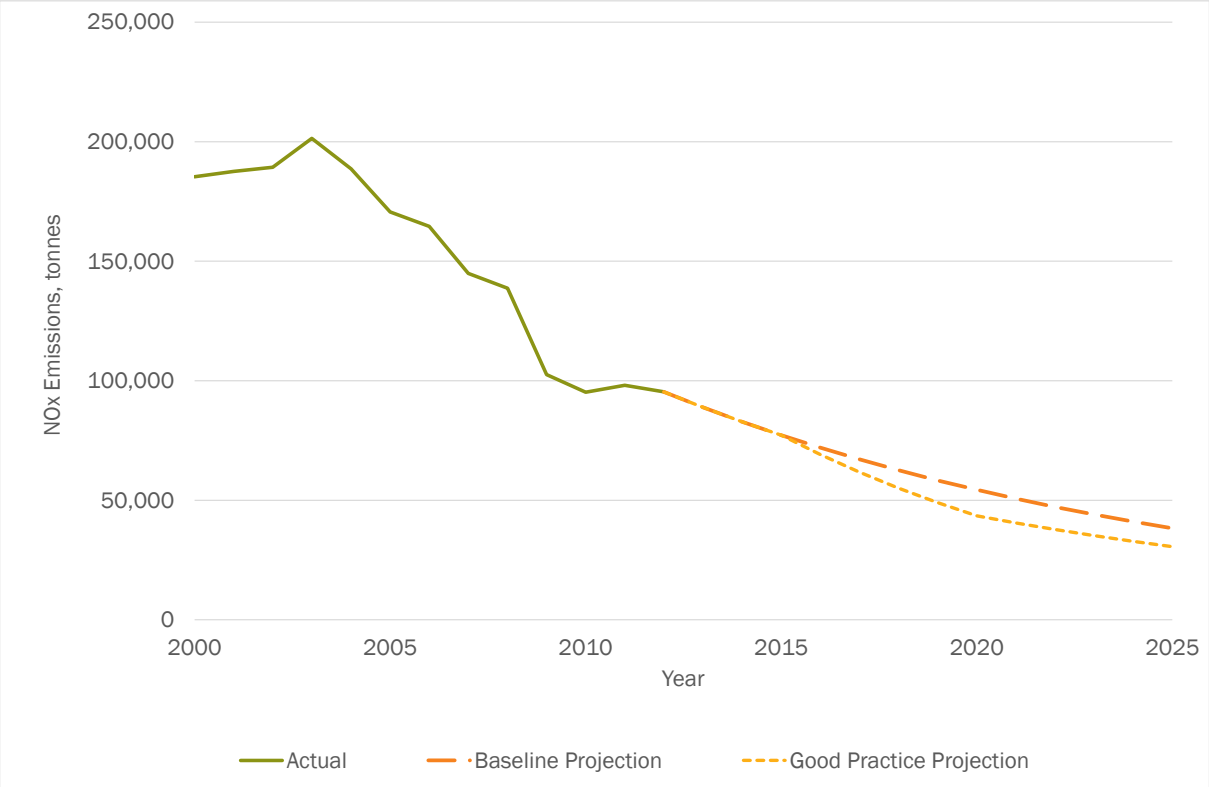


Figure 290: Change in PM_{10} Emissions, tonnes

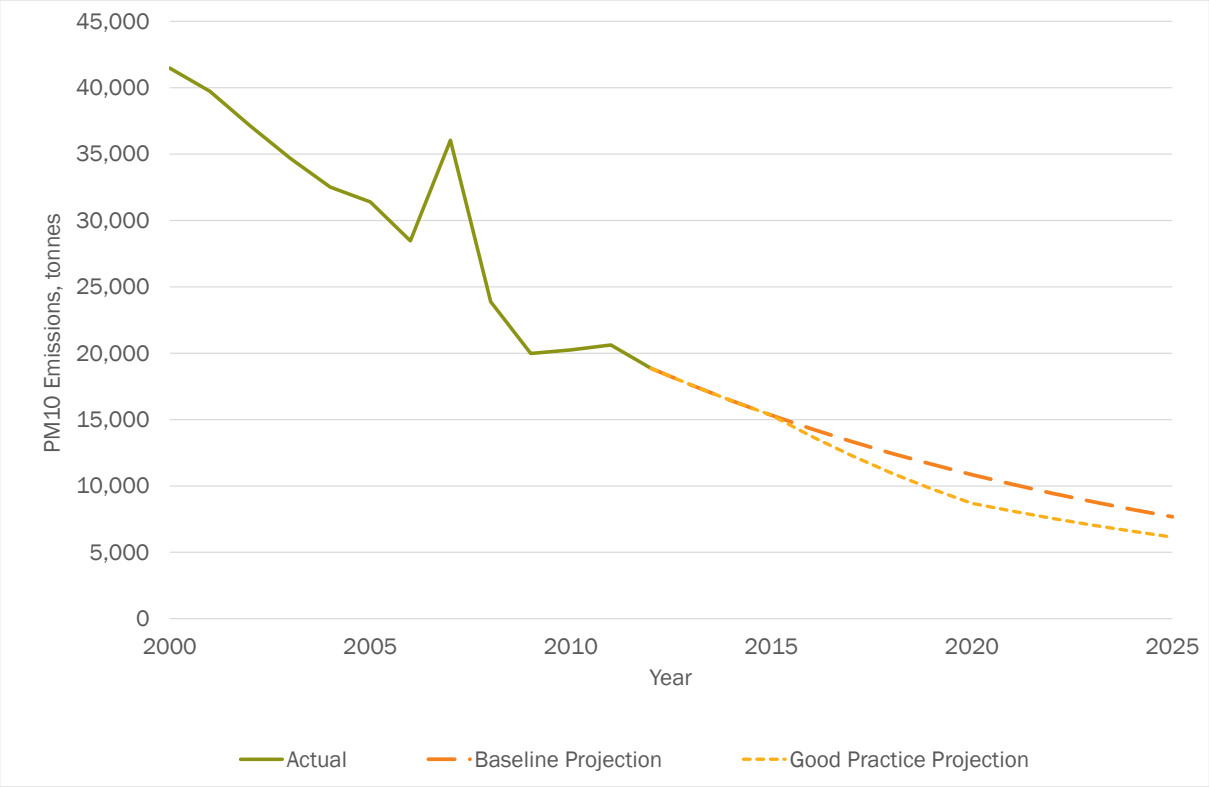


Figure 291: Change in Groundwater Abstraction – Public Supply, million cubic metres

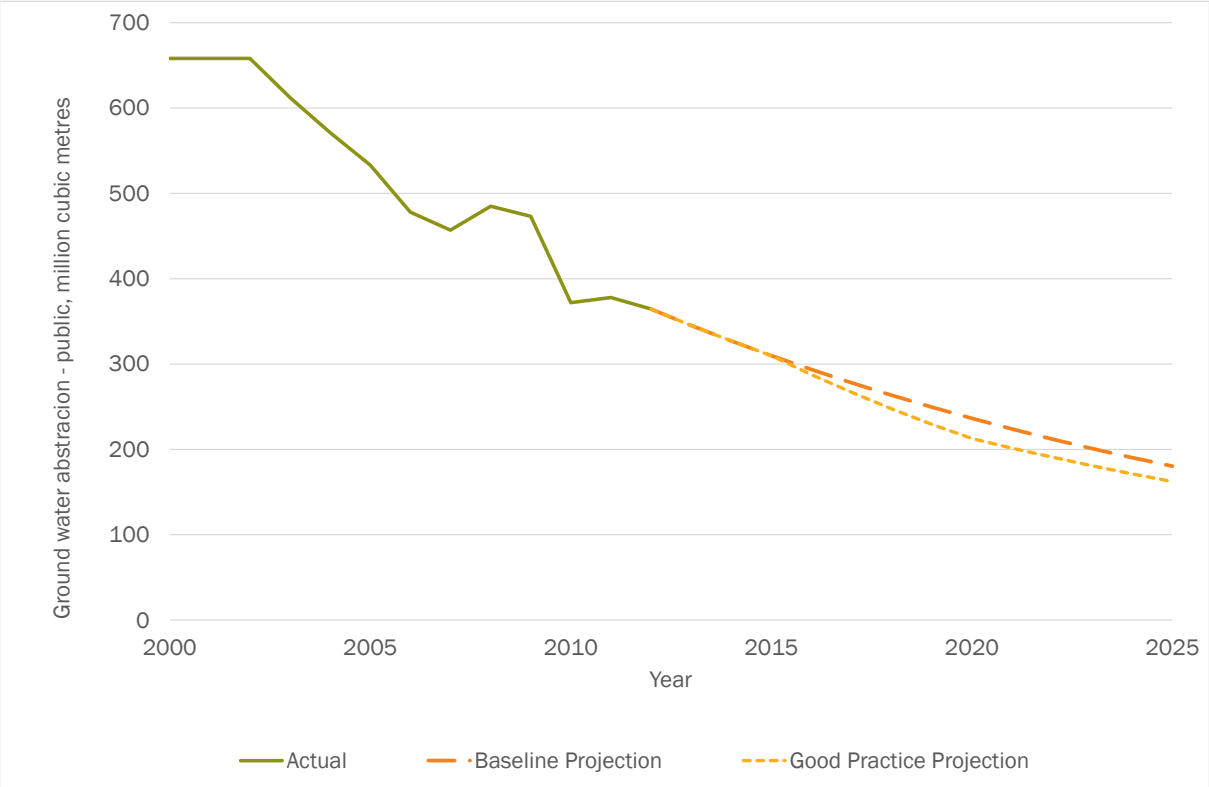


Figure 292: Change in Groundwater Abstraction – Manufacturing, million cubic metres

Figure 293: Change in Groundwater Abstraction – Agriculture, million cubic metres

Figure 294: Change in Surface Water Abstraction – Public Supply, million cubic metres

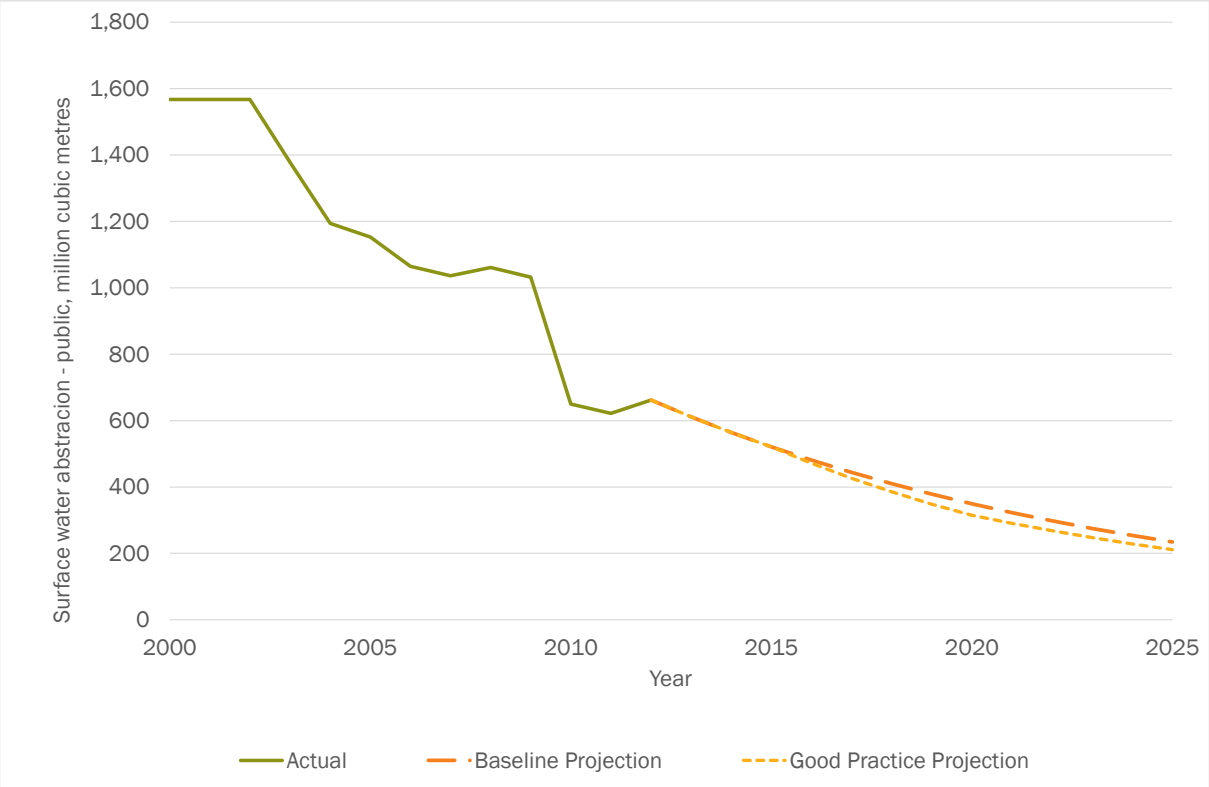


Figure 295: Change in Surface Water Abstraction – Manufacturing, million cubic metres

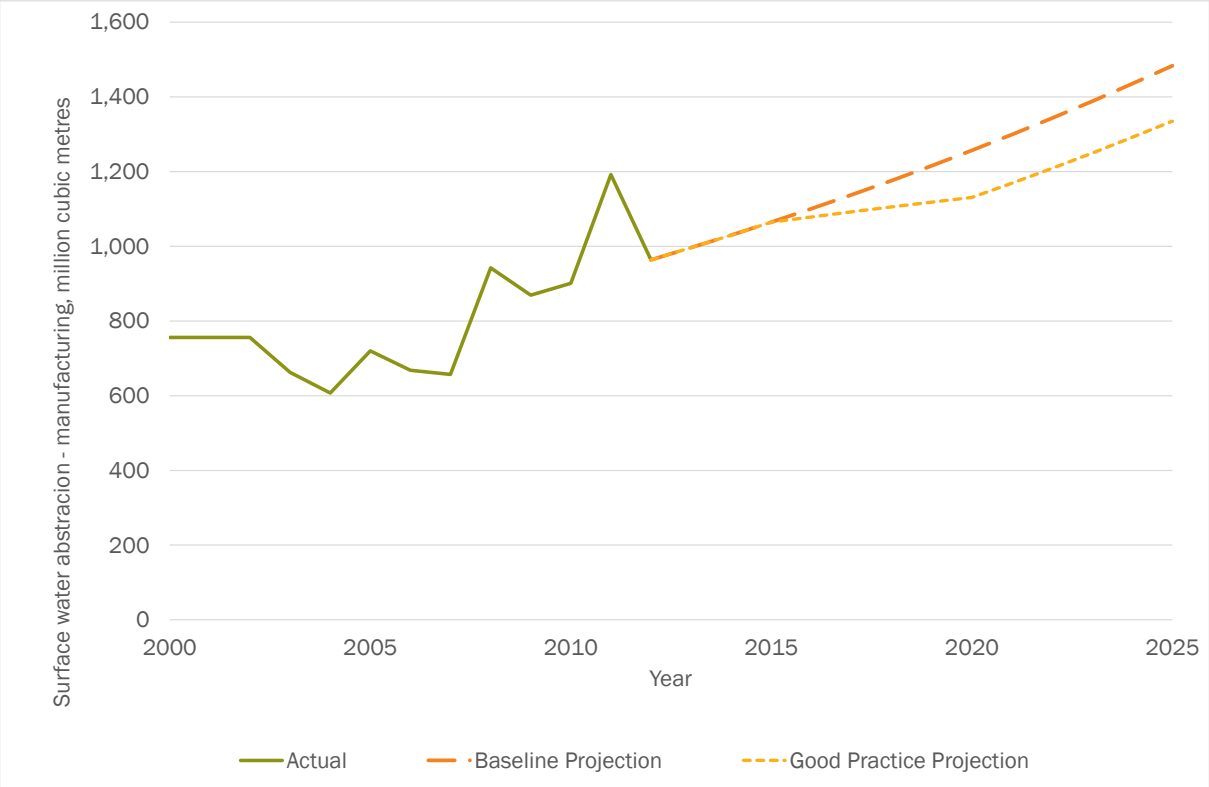


Figure 296: Change in Surface Water Abstraction – Agriculture, million cubic metres

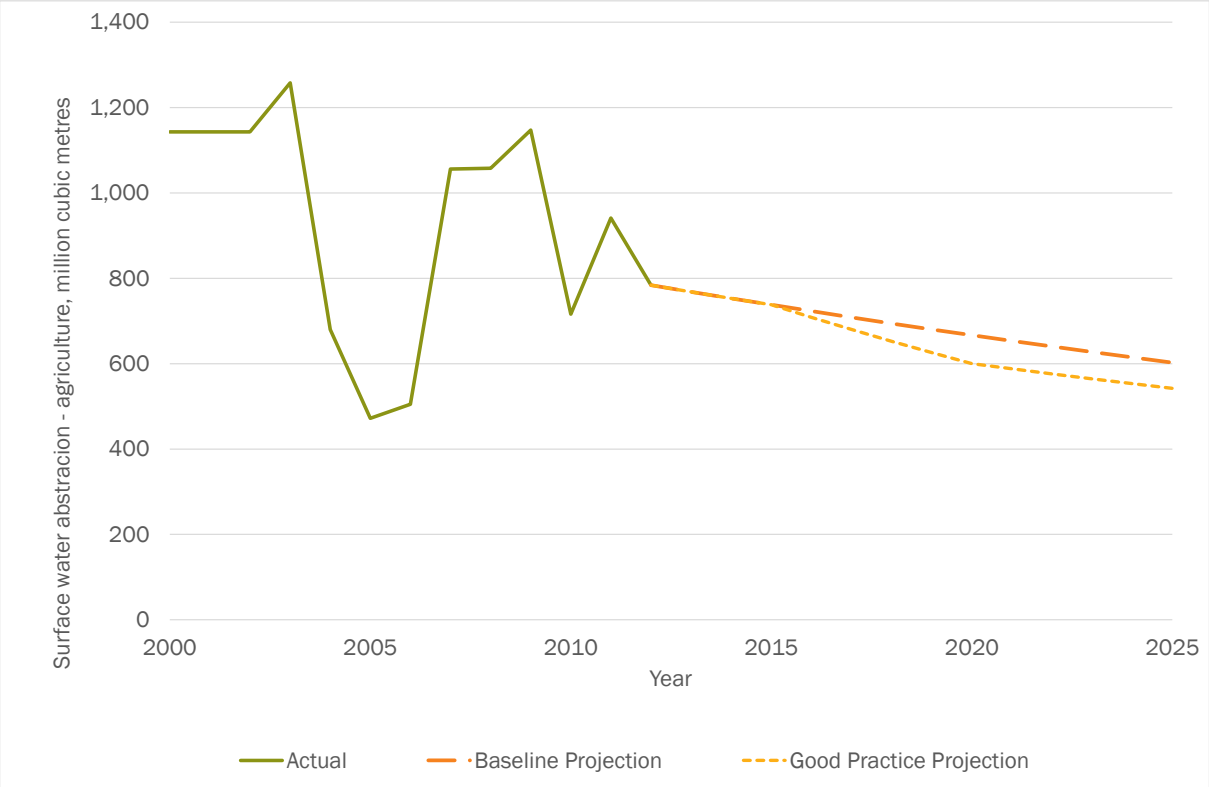


Figure 297: Change in Active Ingredients in Pesticides, tonnes

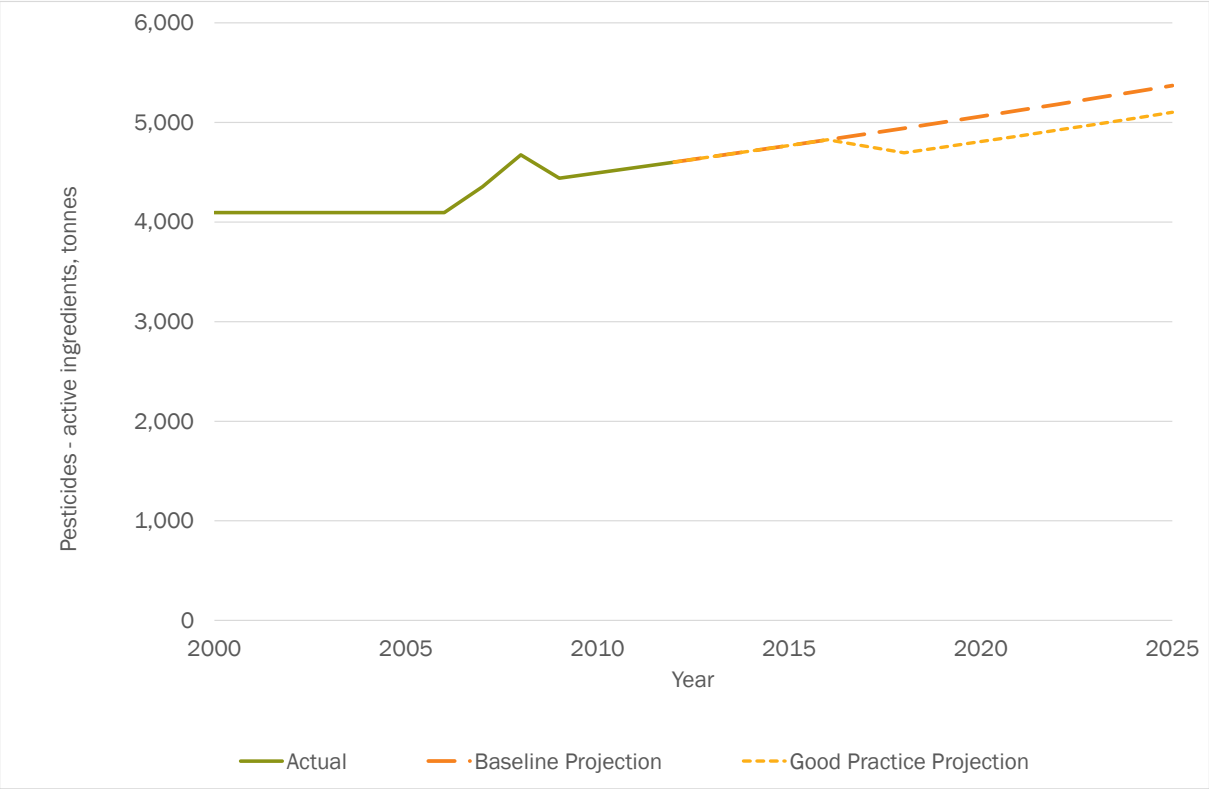


Figure 298: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

Figure 299: Change in Aggregates Extraction, thousand tonnes

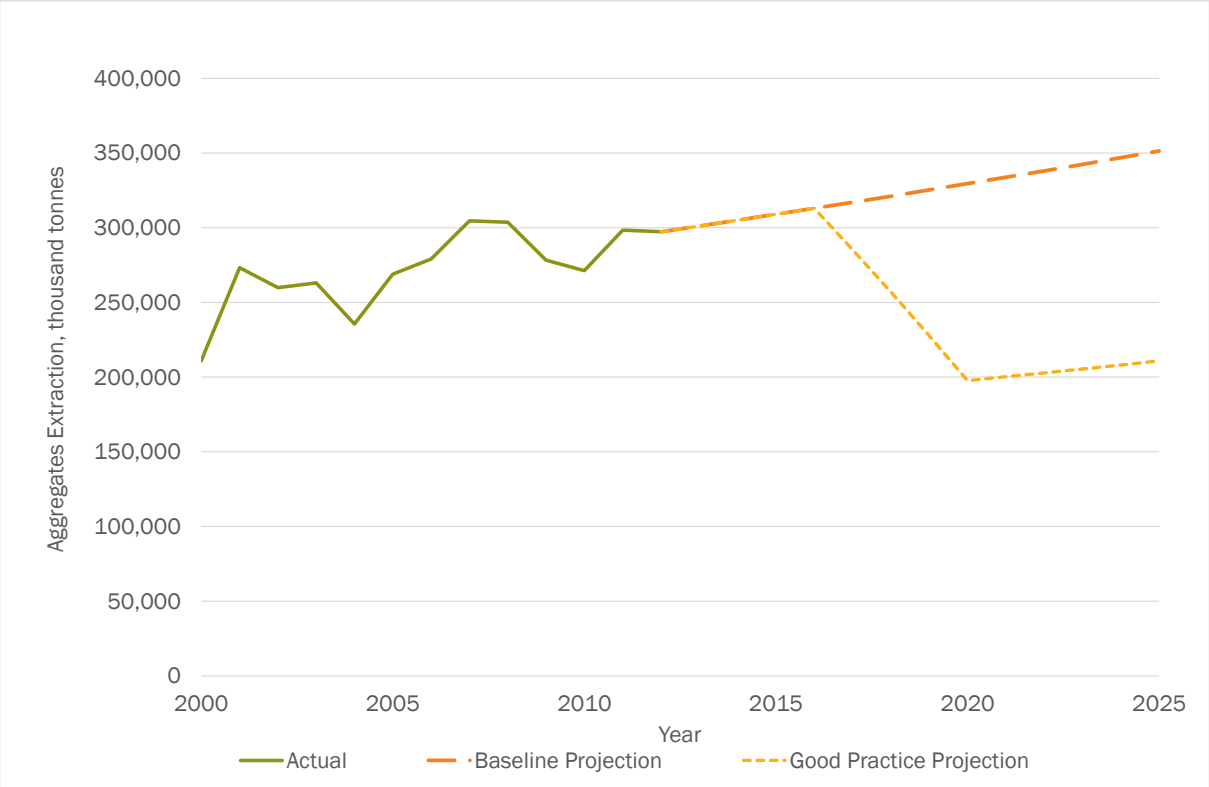


Figure 300: Change in Paper & Card Packaging Generation, thousand tonnes

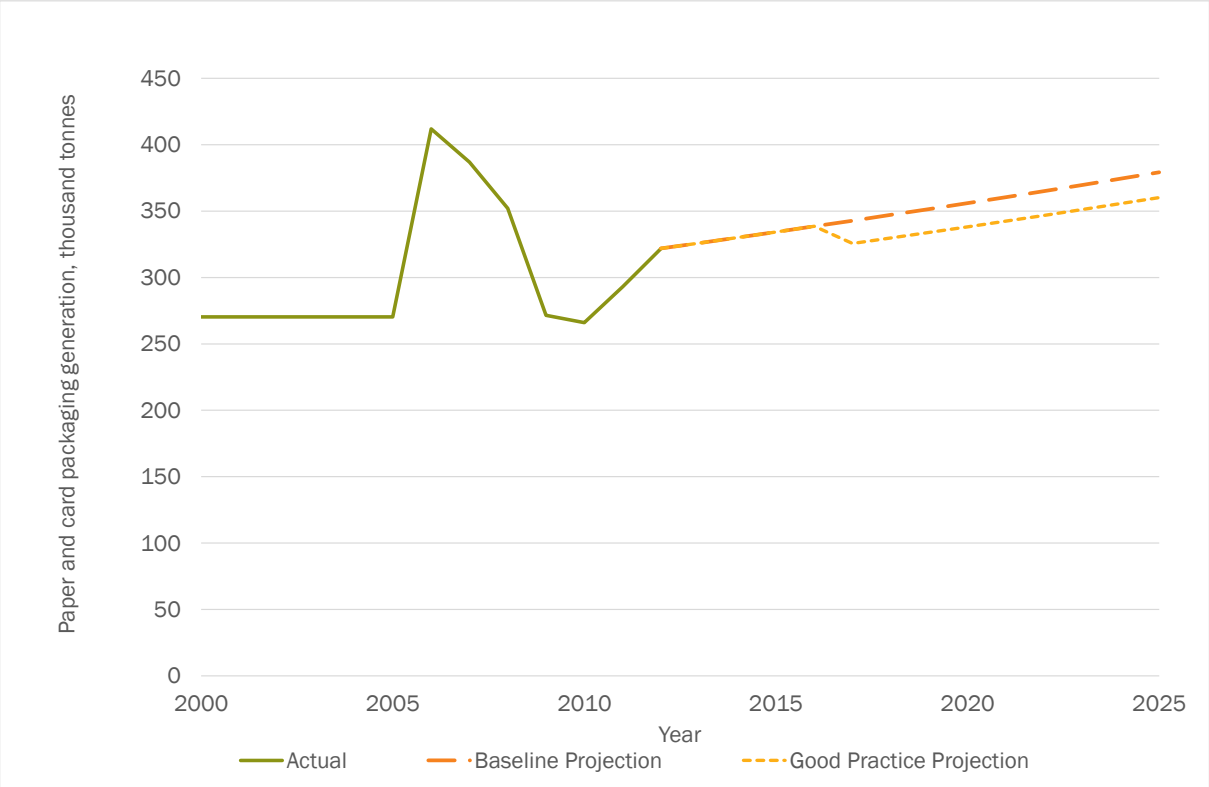


Figure 301: Change in Plastic Packaging Generation, thousand tonnes

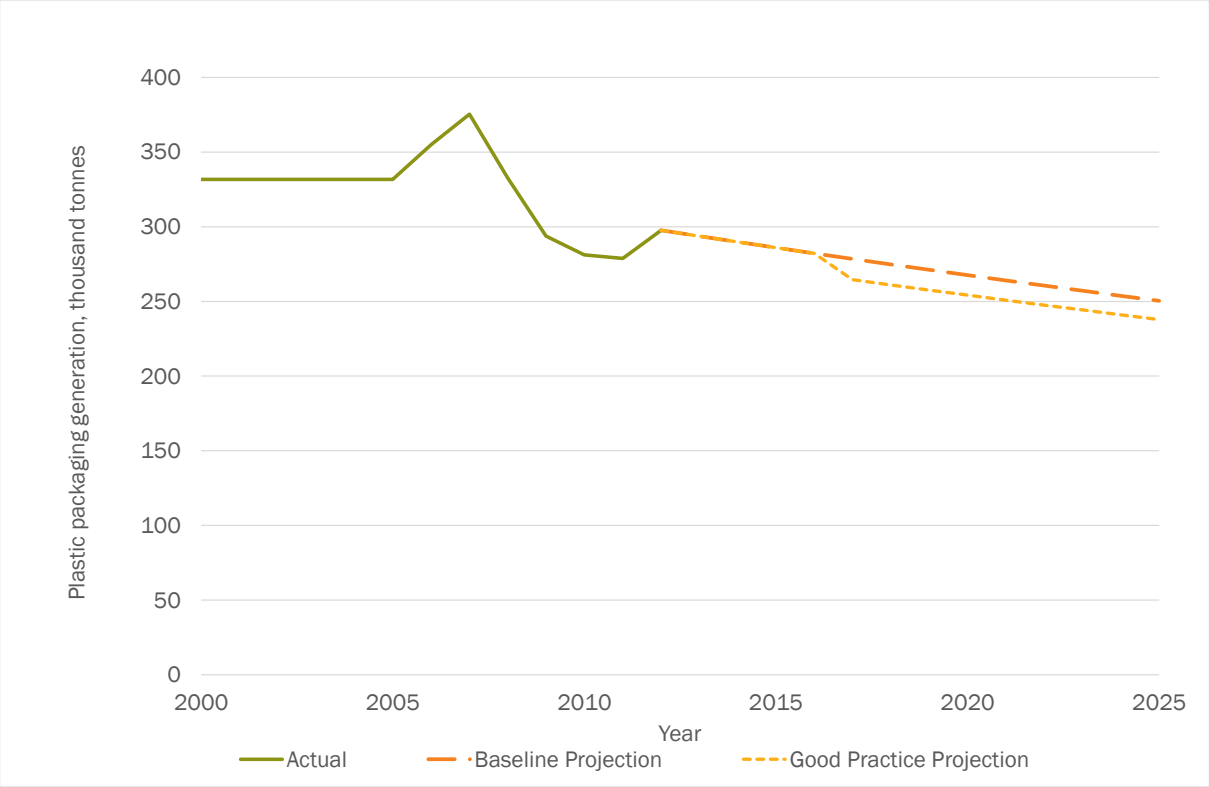


Figure 302: Change in Wood Packaging Generation, thousand tonnes

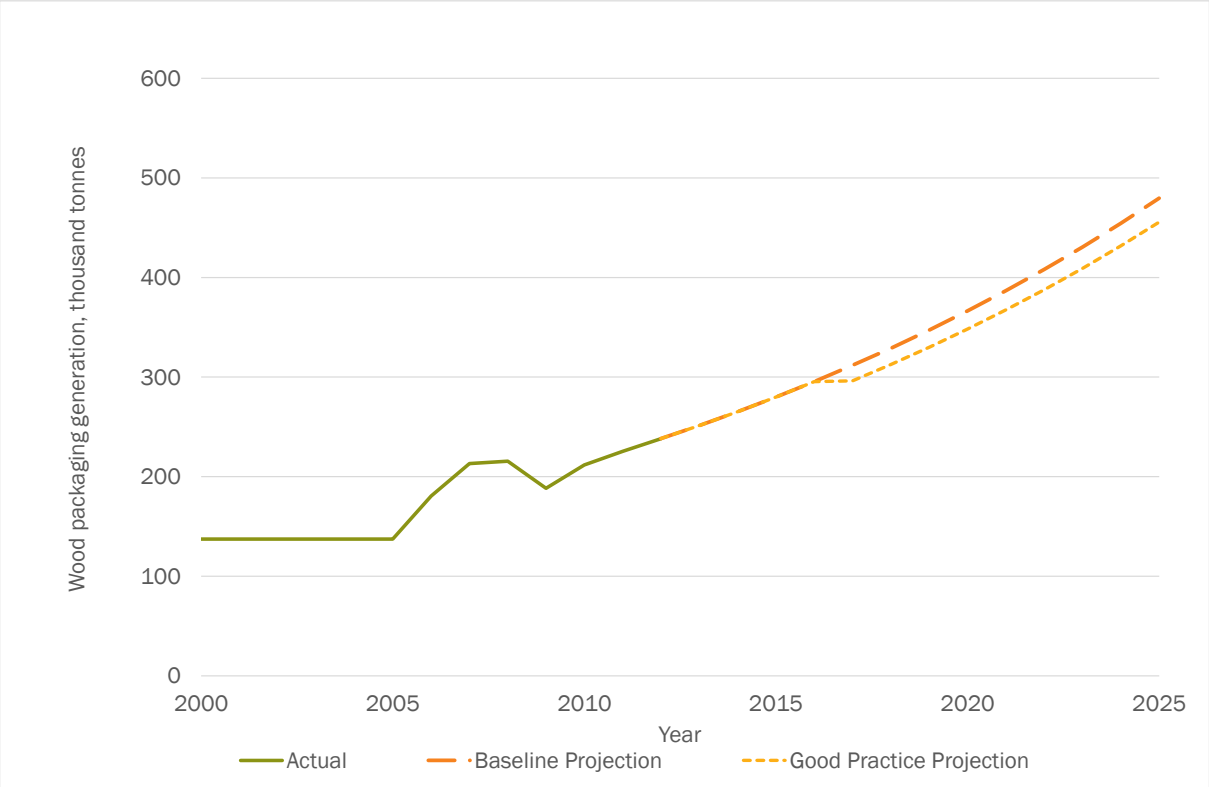


Figure 303: Change in Metal Packaging Generation, thousand tonnes

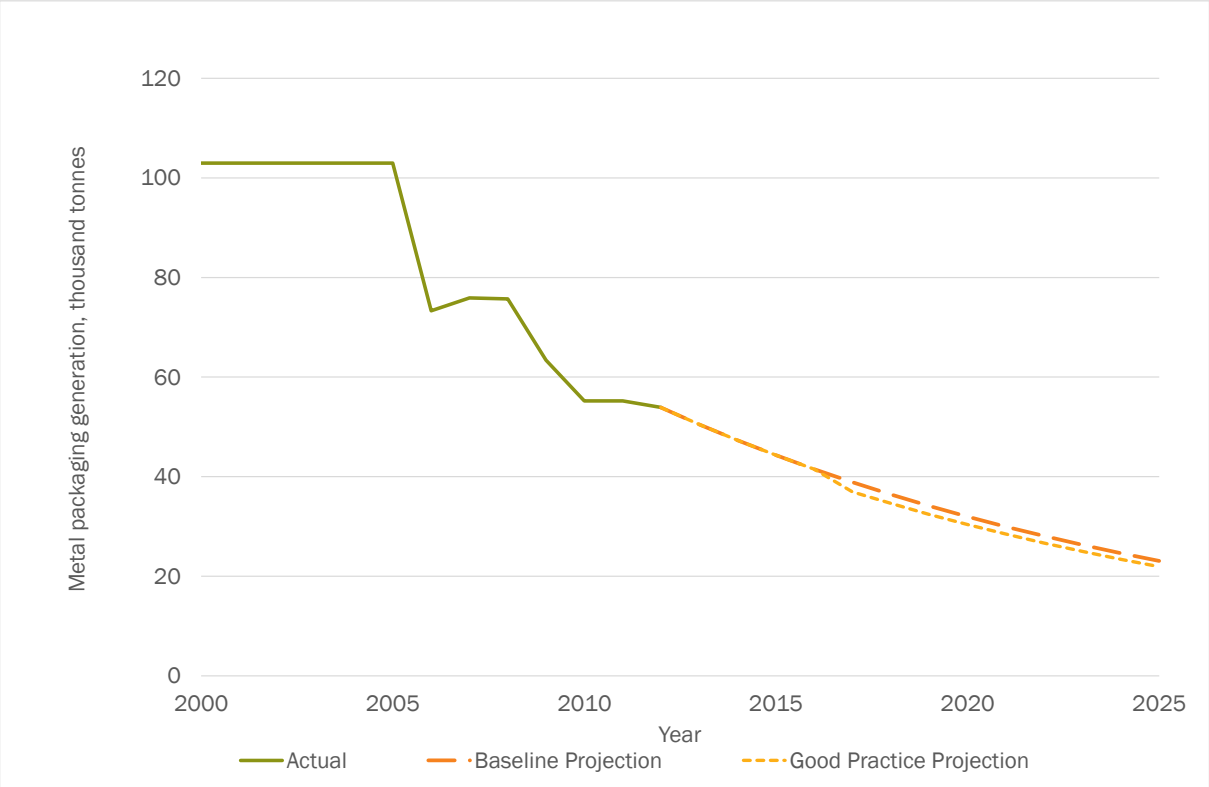


Figure 304: Change in Glass Packaging Generation, thousand tonnes

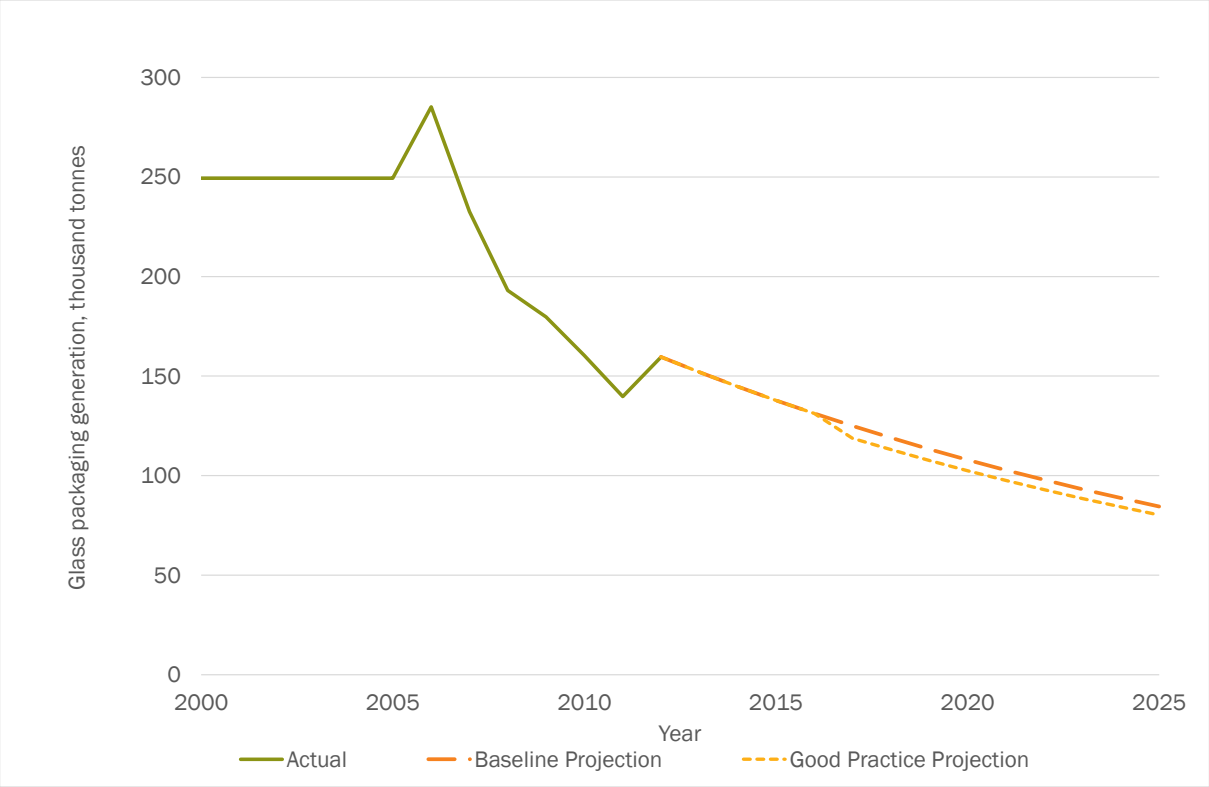
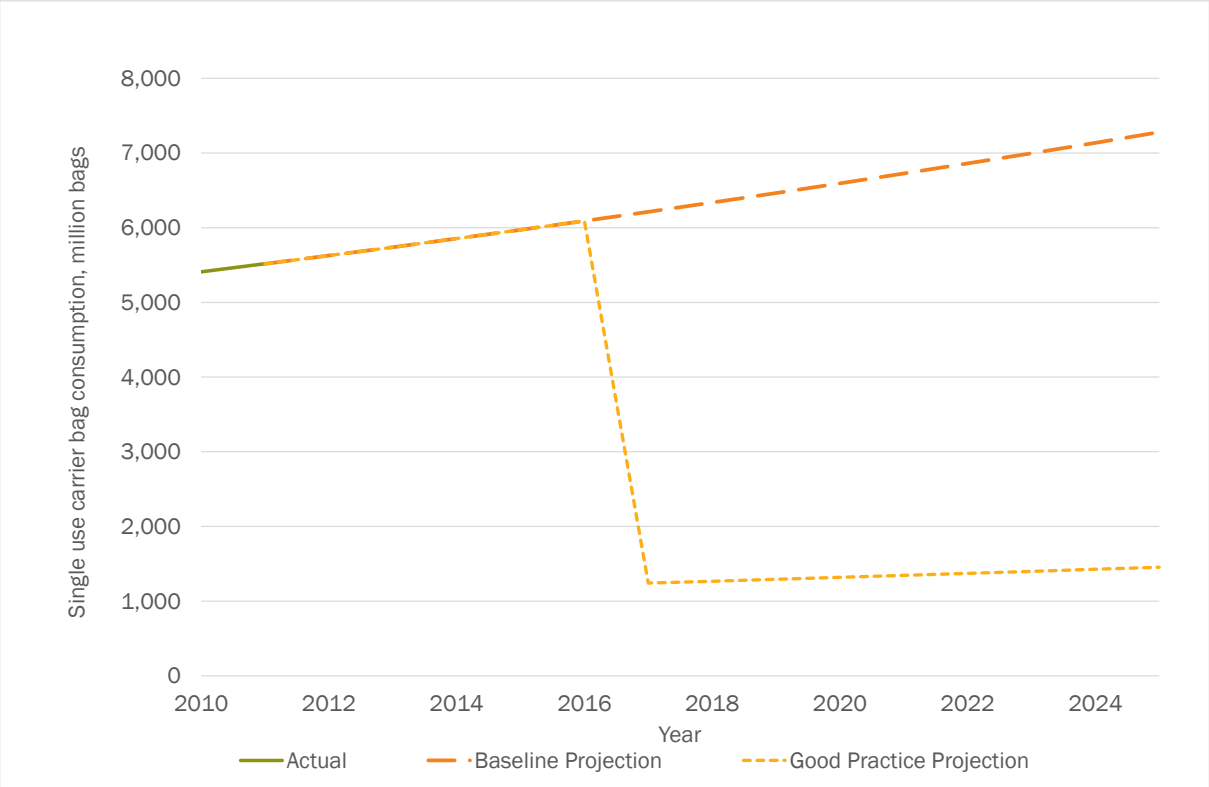


Figure 305: Change in Consumption of Single Use Carrier Bags, million bags



A.15.6 Full Revenue Outputs

Table 238: Revenue Outturns from Model, million RON (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	130	258	386	513	639	764	888	1,012	1,012	1,012
	C&I / Heating	0	0	529	1,044	1,545	2,033	2,510	2,976	3,431	3,877	3,877	3,877
	Electricity	0	49	49	49	49	49	49	49	49	49	49	49
	Sub-total Energy, million RON	*0*	*49*	*708*	*1,351*	*1,980*	*2,595*	*3,198*	*3,789*	*4,369*	*4,939*	*4,939*	*4,939*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.2%*	*0.3%*	*0.4%*	*0.4%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	1,402	2,838	4,306	5,810	7,694	7,879	8,068	8,261	8,459	8,663
	Passenger Aviation Tax	0	0	571	1,129	1,149	1,168	1,188	1,208	1,227	1,247	1,266	1,286
	Freight Aviation Tax	0	0	0.06	0.11	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09
	Sub-total Transport, million RON	*0*	*0*	*1,973*	*3,967*	*5,455*	*6,978*	*8,882*	*9,086*	*9,295*	*9,508*	*9,726*	*9,948*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.3%*	*0.6%*	*0.8%*	*1.0%*	*1.2%*	*1.2%*	*1.2%*	*1.2%*	*1.2%*	*1.2%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	0	0	795	1,500	1,488	1,475	1,484	1,492	1,500	1,508	1,516

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	2	5	8	13	14	16	18	20	22	24	26
	Air Pollution Tax	0	415	765	1,055	1,291	1,479	1,353	1,300	1,249	1,200	1,154	1,110
	Water Abstraction Tax	0	78	149	215	276	333	321	318	316	314	313	313
	Waste Water Tax	0	134	260	377	363	363	363	363	363	363	363	363
	Pesticides Tax	0	0	54	106	105	106	107	109	110	111	113	114
	Aggregates Tax	0	0	3,353	3,056	2,752	2,439	2,118	2,145	2,173	2,201	2,229	2,258
	Packaging Tax	0	0	154	145	144	144	143	142	142	142	142	142
	Single Use Bag Tax	563	1,268	1,293	246	252	257	263	269	275	281	287	293
	Fertiliser Tax	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	Sub-total Pollution & Resource, million RON	*563*	*1,897*	*6,033*	*6,004*	*6,697*	*6,624*	*6,159*	*6,147*	*6,139*	*6,134*	*6,132*	*6,134*
	Sub-total Pollution & Resource, % GDP	*0.1%*	*0.3%*	*0.9%*	*0.9%*	*0.9%*	*0.9%*	*0.8%*	*0.8%*	*0.8%*	*0.8%*	*0.7%*	*0.7%*
	Total, million RON	563	1,947	8,714	11,322	14,132	16,198	18,239	19,022	19,803	20,580	20,797	21,021

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.1%	0.3%	1.3%	1.6%	2.0%	2.2%	2.5%	2.5%	2.5%	2.6%	2.5%	2.5%

A.16.0Slovakia: Taxes, Charges and Model Outputs

During the course of the study the latest data available from official sources was sought, namely TAXUD taxes in Europe database, energy excise duty tables and the OECD database on taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2013. Future increases may therefore not be fully captured in this analysis and therefore the projected increase in revenues would effectively include increased rates in early 2014 or shortly thereafter. Data on environmental charges is less well regulated and administered. We have used the best sources available but recognise that some rates might not be fully up to date. However, given the generally low level of environmental charges and the magnitude of the changes to these suggested under 'good practice', the impact on the overall revenue projections is expected to be negligible.

A.16.1 Energy

- New levies for energy products and electricity were implemented in 2008 to supplement existing taxes on mineral oils.[970] A full breakdown of tax rates and revenues are presented in Table 239. Further to this information, the taxes allow for a number of exemptions which vary by material. Tax revenues in 2011 for all energy products and electricity excise duties totalled €1,109 million, equivalent to 1.61% of GDP.[971] In total, four separate items are taxed, as follows:
    - An excise duty on the following mineral oils: petrol, gas oil, kerosene, heavy fuel oil and liquid petroleum gas (LPG).[972] Tax revenues in 2011 totalled €1,109.20 million, equivalent to 1.61% of GDP;
    - An excise duty on electricity supplied to businesses;[973]

[970] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=892/1357119980&taxType=Energy+products+and+electricity

[971] All % GDP values in this section are calculated using data from: Eurostat (2013) *GDP and main components - Current prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAMA_GDP_C

[972] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.8-47, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[973] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.64-70, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- An excise duty on natural gas and other gases;[974] and
- An excise duty on coal, coke and lignite used for heating by businesses.[975]

Table 239: Excise Duty Rates (1st July 2013)

Tax Type	Tax Object	Unit	Tax Rate (€)	Tax Revenue 2011	
				€ million[1]	GDP Equivalent
Excise Duty on Mineral Oils				1071.30	1.55%
	Petrol – Leaded[2]	per 1000 litres	550.52		
	Petrol – Leaded[3]	per 1000 litres	514.5		
	Gas Oil[4]	per 1000 litres	386.4		
	Gas Oil[5]	per 1000 litres	368		
	Kerosene	per 1000 litres	481.31		
	Heavy Fuel Oil	per 1000 kg	111.5		
	LPG - Propellant use	per 1000 kg	182		
	LPG - Industrial/Commercial use	per 1000 kg	182		
Excise Duty on Natural Gas				21.37	0.031%
	Propellant use	per GJ	2.6		
	Industrial/Commercial use	per GJ	2.6		
	Heating (business)	per GJ	0.37		
	Heating (non-business)	per GJ	0.37		
Excise Duty on Electricity - Business use		per MWh	1.32	15.93	0.023%
Excise Duty on Solid Fuels - Heating (business)		per GJ	0.31	0.59	0.0009%

Notes:

1. Revenues from: Eurostat (2013) National Tax List, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics
2. Biofuel content <3.3%.
3. Biodiesel content <5.4%.
4. Biodiesel content >=5.4%.
5. Biodiesel content <5.4%.

Source: European Commission (2013) Excise Duty Tables, Accessed 2nd December 2013, pp.8-70, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

A.16.2 Transport (excl. transport fuels)

- Circulation:

[974] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.48-56, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

[975] European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, pp.57-63, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- A motor vehicles tax applies to all individuals or legal entities that use a motor vehicle and a towed vehicle for business activities.[976] The tax rate structure is set by each regional authority, the precise tax rate for each vehicle is proportionate to the engine cylinder capacity (for personal vehicles) or the total weight and axle numbers (for utility vehicles and buses). Tax revenues in 2011 totalled €131 million, equivalent to 0.19% of GDP.
- All vehicles using motorways must carry a Eurovignette. For vehicles heavier than 3.5 tons, this was replaced by an electronic road toll system in 2010.[977] Toll rates are charged per km and depend on the vehicle type, weight and (in the case of trucks) number of axles, emissions class, and the type of road used. [978] The toll rates for different road types are listed in Table 240 to Table 242.

Table 240: Toll Rates (per km) for the Use of Specified Sections of Highways and Expressways

Vehicle Type	Vehicle Category		Emission Class		
			EURO 0 – II	EURO III, IV	EURO V, VI, EEV
Lorries	3.5 to 12 tonnes		€0,103	€0,093	€0,080
	Greater than 12 tonnes	2 axles	€0,222	€0,201	€0,172
		3 axles	€0,234	€0,212	€0,181
		4 axles	€0,243	€0,220	€0,188
		5 axles	€0,234	€0,212	€0,181
Busses	3.5 to 12 tonnes		€0,060	€0,050	€0,030
	Greater than 12 tonnes		€0,110	€0,100	€0,060

Source: Myto (2013) Changes in the Electronic Toll from 1 January 2014, Accessed 16th January 2014, https://www.emyto.sk/web/guest/zmeny-v-myte/#zmena_sadzieb_en

[976] European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=553/1357119977&taxType=Other+indirect+tax

[977] OECD (2011) *Environmental Performance Reviews: Slovak Republic 2011*, p.44, http://dx.doi.org/10.1787/9789264121836-en

[978] Myto (2013) *Changes in the Electronic Toll from 1 January 2014,* Accessed 16th January 2014, https://www.emyto.sk/web/guest/zmeny-v-myte/#zmena_sadzieb_en

Table 241: Toll Rates (per km) for the Use of Specified Sections of the 1st Class Roads Parallel with Highways and Expressways

Vehicle Type	Vehicle Category		Emission Class		
			EURO 0 – II	EURO III, IV	EURO V, VI, EEV
Lorries	3.5 t – do 12 t		€0,080	€0,072	€0,062
	12 t and more	2 axles	€0,172	€0,156	€0,133
		3 axles	€0,181	€0,164	€0,140
		4 axles	€0,185	€0,167	€0,143
		5 axles	€0,181	€0,164	€0,140
Busses	3.5 t – do 12 t		€0,040	€0,030	€0,020
	12 t and more		€0,080	€0,070	€0,040

Source: Myto (2013) Changes in the Electronic Toll from 1 January 2014, Accessed 16th January 2014, https://www.emyto.sk/web/guest/zmeny-v-myte/#zmena_sadzieb_en

Table 242: Toll Rates (per km) for the Use of Specified Sections of Other 1st Class Roads and Specified Sections of 2nd and 3rd Class Roads

Vehicle Type	Vehicle Category		Emission Class		
			EURO 0 – II	EURO III, IV	EURO V, VI, EEV
Lorries	3.5 t – do 12 t		€0	€0	€0
	12 t and more	2 axles	€0	€0	0 €
		3 axles	€0	€0	0 €
		4 axles	€0	€0	0 €
		5 axles	€0	€0	0 €
Busses	3.5 t – do 12 t		€0	€0	€0
	12 t and more		€0	€0	€0

Source: Myto (2013) Changes in the Electronic Toll from 1 January 2014, Accessed 16th January 2014, https://www.emyto.sk/web/guest/zmeny-v-myte/#zmena_sadzieb_en

- Charges and fees:
  - Municipalities have the option to charge motor vehicle owners for a permit to enter historical city districts. The tax rate is set individually be each

municipality.[979] Tax revenues in 2011 totalled €0.52 million, equivalent to 0.0008% of GDP.[980]

A.16.3 Pollution and Resources

- A tax is levied on air pollution from both large and medium sources, and small sources (the tax was introduced under Law on air pollution charges No. 401/1999 Coll.).[981] Tax rates for large and medium sources are defined in terms of tonnes of material emitted and vary according to the type of pollutant (Table 243). There is no fixed tax rate for air pollution from smaller sources. Municipalities determine an annual rate specific to each operator of a small source according to the quantity and type of air pollution emitted. Tax revenues in 2011 totalled €14.59 million, equivalent to 0.021% of GDP.[982]

Table 243: Tax Rates for Air Pollution from Large and Medium Sources

Pollution Type (Measured or Estimated Emissions)	Tax rate (EUR per tonne)
NOx	€49.7908
SO_2	€66.3878
CO	€33.1939
PM	€165.9695
Other substances assigned to the First pollutant class	€1,327.7567
Other substances assigned to the Second pollutant class	€663.8783
Other substances assigned to the Third pollutant class	€331.9391
Other substances assigned to the Fourth pollutant class	€66.3878

Source: Personal communication with Professor Jirina Jilkova, Prague University of Economics, 24th January 2014.

- A landfill tax applies to a number of waste streams (the tax was implemented under Law on charges for waste deposition No. 17/2004 Coll., as amended by

[979] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[980] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

[981] See OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[982] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

the law 434/2013 Coll, as amended by the law 434/2013 Coll.). Different tax rates are levied on each waste type as shown in Table 244. The municipality within which the landfill is sited levies the charge and can use the income to support investments on waste management infrastructure.

Table 244: Landfill Tax Rates

Waste type (LF tax in €/t)	2014	2015	2016[1]
Inert waste, sorted C&D waste soil and rock without hazardous compounds waste from clean-up of dumps	€0.33	0.33	€0.33
Other (=Non-hazardous) waste except waste listed under items 1, 3 a 5	€6.64	6.64	€6.64
Residual MSW after sorting out at least 3 recyclable fractions	€9.96	9.96	€9.96
Residual MSW after sorting out at least 4 recyclable fractions	€5.98	5.98	€5.98
Residual MSW after sorting out at least 5 recyclable fractions	€4.98	4.98	€4.98
Hazardous waste excluding waste listed under item 6	€33.19	33.19	€33.19
Other waste listed in Annex 4	€20	€25	€30
Hazardous waste listed in Annex 5	€45	€52.5	€60
Note: 1. The rate of landfill tax will be increased at the average annual rate of inflation after 2016.			

Source: Personal communication with Slovak Environment Agency

- A charge is also levied on the deposition of waste to sludge basins. The following rates apply (revenues from this charge are unknown):[983]
  - Hazardous waste: 0.8298 EUR/tonne waste; and
  - Other waste: 0.2655 EUR/ tonne waste
- The discharge of wastewater is subject to a charge (Government decree No. 755/2004 Coll.).[984] The tax rate is proportionate to the sum of liabilities calculated for different pollutants (Table 245). The decree specifies charges for the years 2006 to 2008 (which were set at 75% to 100% of the basic rate), and for the years after 2008 (set at 100% of the basic rate).Tax revenues in 2011 totalled €9.11 million, equivalent to 0.013% of GDP.[985]

[983] Personal communication with Professor Jirina Jilkova, Prague University of Economics, 3rd February 2014.

[984] OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* http://www2.oecd.org/ecoinst/queries/index.htm

[985] Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tax_revenue_statistics

Table 245: Tax Rates for Discharge of Wastewater

Type of Pollutant	Tax rate (€ per tonne)
Chemical oxygen demand	€0.1992 - €0.3983
Insoluble substances	€0.0996
P total	€3.3194
N total	€0.4979
N-NH4	€0.4979
Dissolved inorganic salts	€0.0166
AOX	€6.6388
Hg	€497.9088
Cd	€99.5818

Source: Personal communication with Professor Jirina Jilkova, Prague University of Economics, 3rd February 2014.

- A charge is applied to the extraction of groundwater with the following rates being applied:
  - €0.0332 per tonne (m^3) for public water provision;
  - €0.0232 per tonne (m^3) for special purposes and for agricultural animals; and
  - €0.0266 per tonne (m^3) for the extraction of geothermal water for energy usage.[986]

A.16.4 Environmentally Harmful Subsidies

In addition to the environmentally harmful subsidies listed in Section 17.2.2, we list here a complete list of subsidies identified in Slovakia by the IEEP and OECD, and from TAXUD Excise Duty Tables, for which financial information is not available.

[986] *Source: Personal communication with Professor Jirina Jilkova, Prague University of Economics, 24th January 2014.*

Table 246: Other Environmentally Harmful Subsidies

Subsidy	Source	Notes
No charge for water abstraction	IEEP	Since the Water Act 2004
Nuclear subsidies	IEEP	The country supports construction of new nuclear power facilities, which are planned to be built in 2012-2013.
Exemptions from excise duties for coal and coke and electricity when used for the carriage of goods and persons (passengers) by public transport within business activities	TAXUD	

Sources: See Table 4 in IEEP (2013) Steps to Greening Country Report: Slovakia, Report for the European Commission, p.10

DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

OECD (2012) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, 2012, pp.307-314, dx.doi.org/10.1787/9789264187610-en

A.16.5 Change in Tax Bases

Table 247: Change in Energy Tax Base

Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	1,530	1,470	-60
Petrol	million litres	634	634	0
Kerosene	million litres	51	51	0
LPG	thousand tonnes	26	21	-5
Heavy Fuel Oil	thousand tonnes	39	39	0
Natural Gas	TJ (GCV)	143,170	130,700	-12,470
Coal	thousand tonnes	2,050	1,773	-278
Electricity	GWh	18,514	18,514	0

This section provides graphics highlighting the historic data on the different tax bases, the baseline trends projected out to 2025 and the magnitude of the reduction in the tax base due to the increased level of taxation. Official and publically available data sources have been used in all cases, except for some waste management data which comes directly from the European Reference Model on Solid Municipal Waste Management.[987] This is to show how the tax base is changing and as such it is to help explain how some of the future revenue estimates are changing. The intention is not to develop a completely accurate projection of the tax bases, which would require a considerable effort in forecasting across all countries, but to instil some degree of realism in the modelling. It is hoped that this approach will yield more accurate results than simply projecting an unchanging tax base forward, especially after an increase in the level of the tax rates. The approach to making the future projections was pragmatic and sought to reflect the historic trends. Where there was no discernable trend or the historic data was showing no readily discernible trend, a best estimate was taken. Clearly there is some level of subjectivity in this approach and this must be recognised when considering the graphics presented below. The aim is to provide a plausible basis for revenue generation, not to initiate a debate around existing trends or how the tax bases are projected forwards.

[987] Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Figure 306: Change in Internal Passenger Flights, flights per year

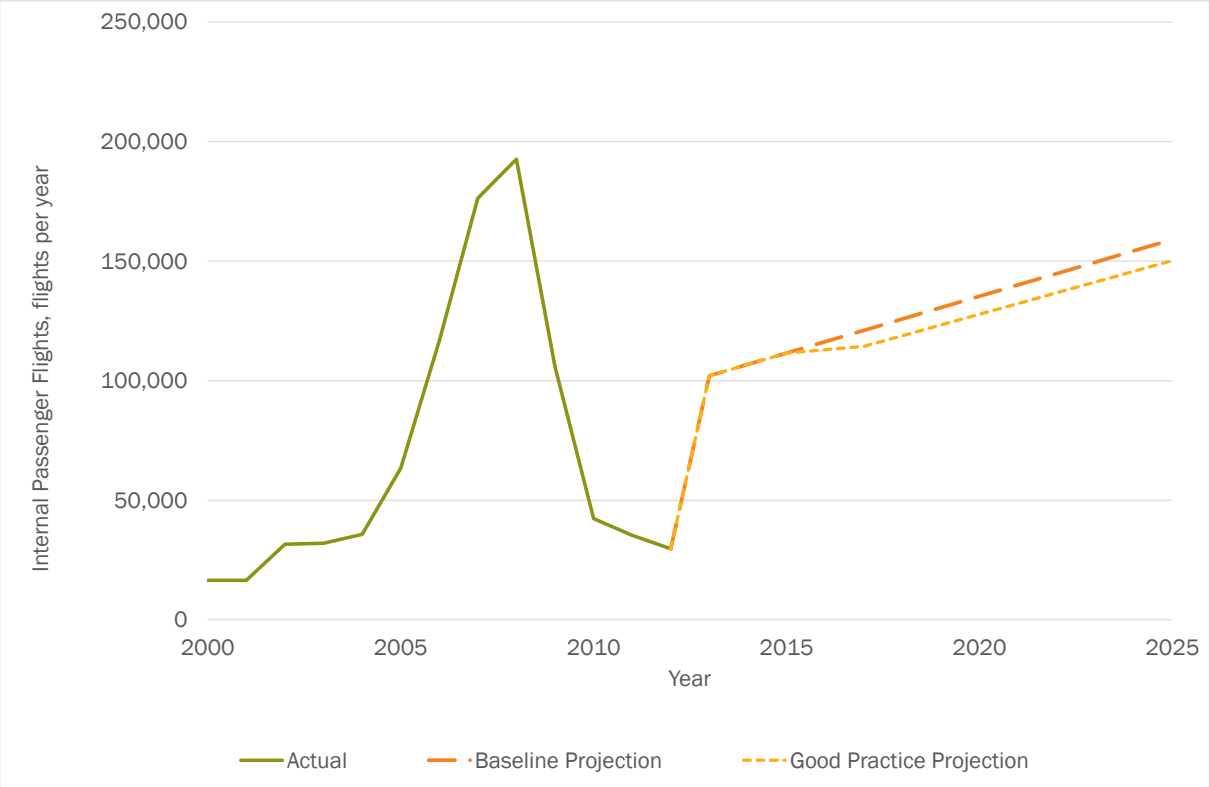


Figure 307: Change in Intra-EU Passenger Flights, flights per year

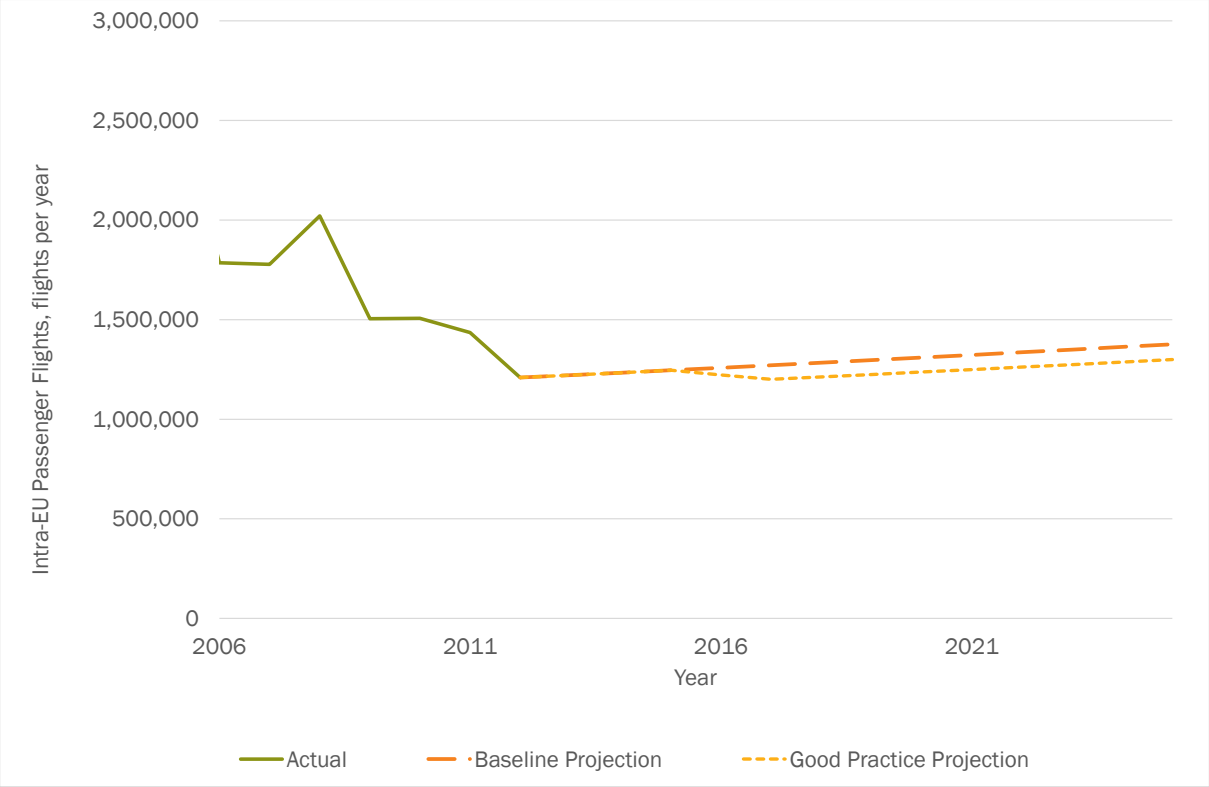


Figure 308: Change in Extra-EU Passenger Flights, flights per year

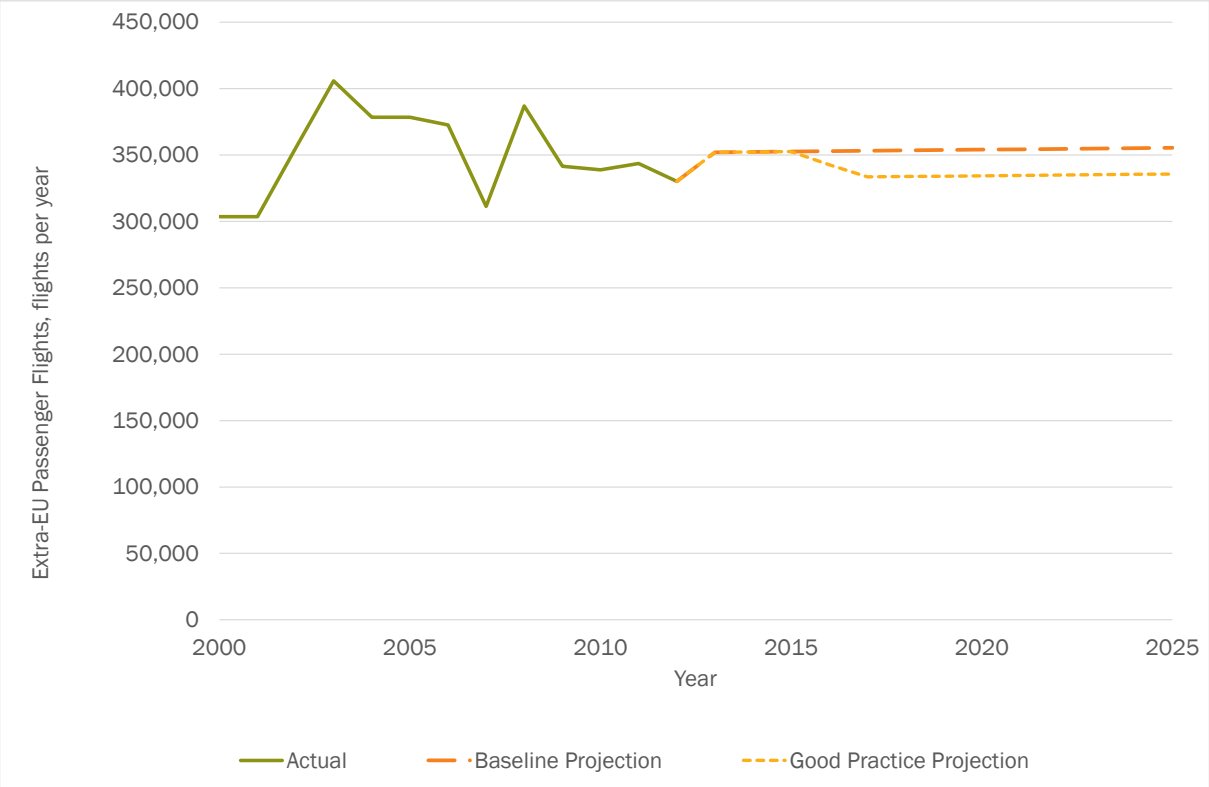


Figure 309: Change in Internal Air-freight, tonnes

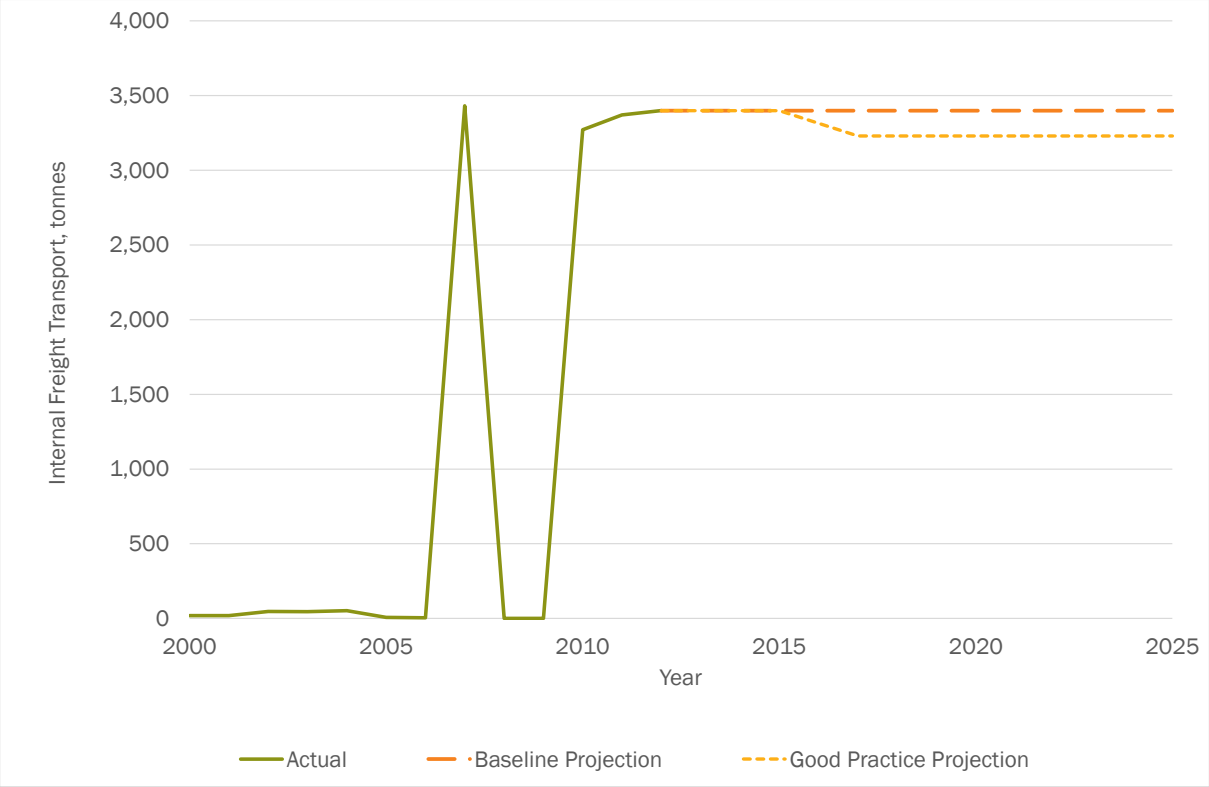


Figure 310: Change in Intra-EU Air-freight, tonnes

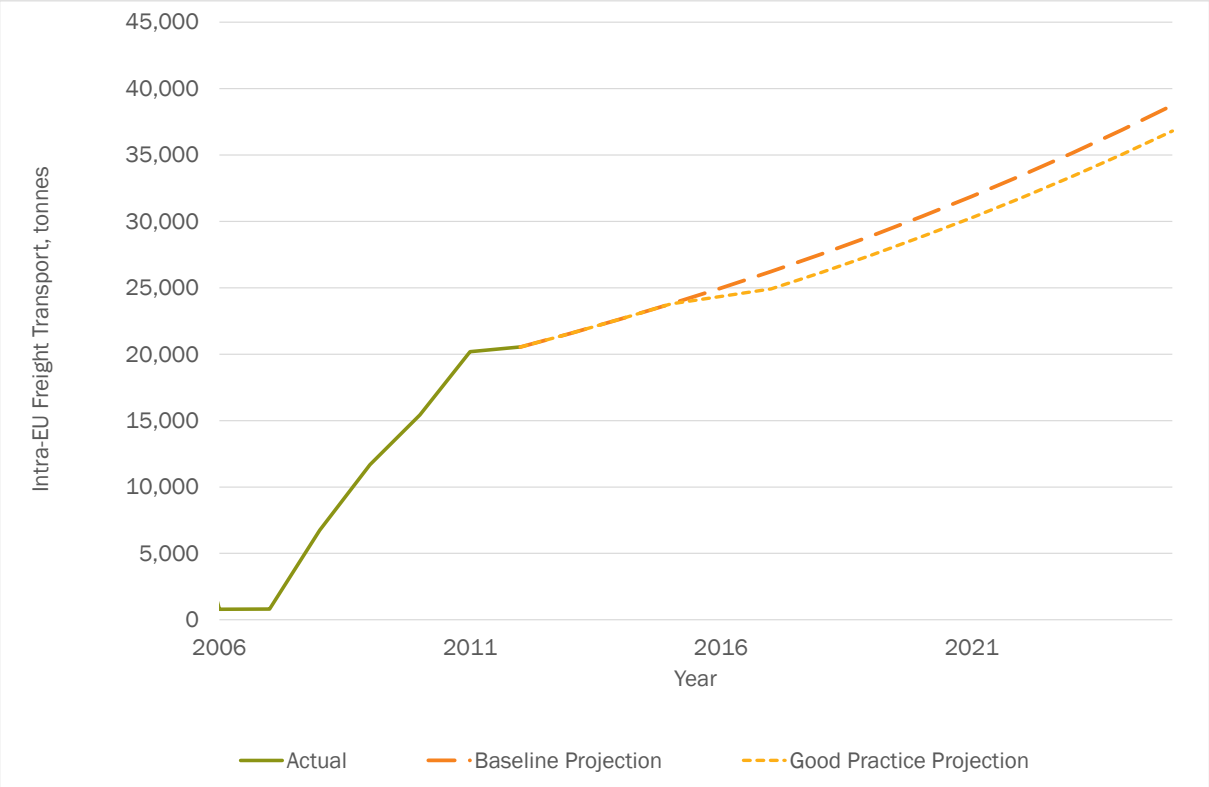


Figure 311: Change in Extra-EU Air-freight, tonnes

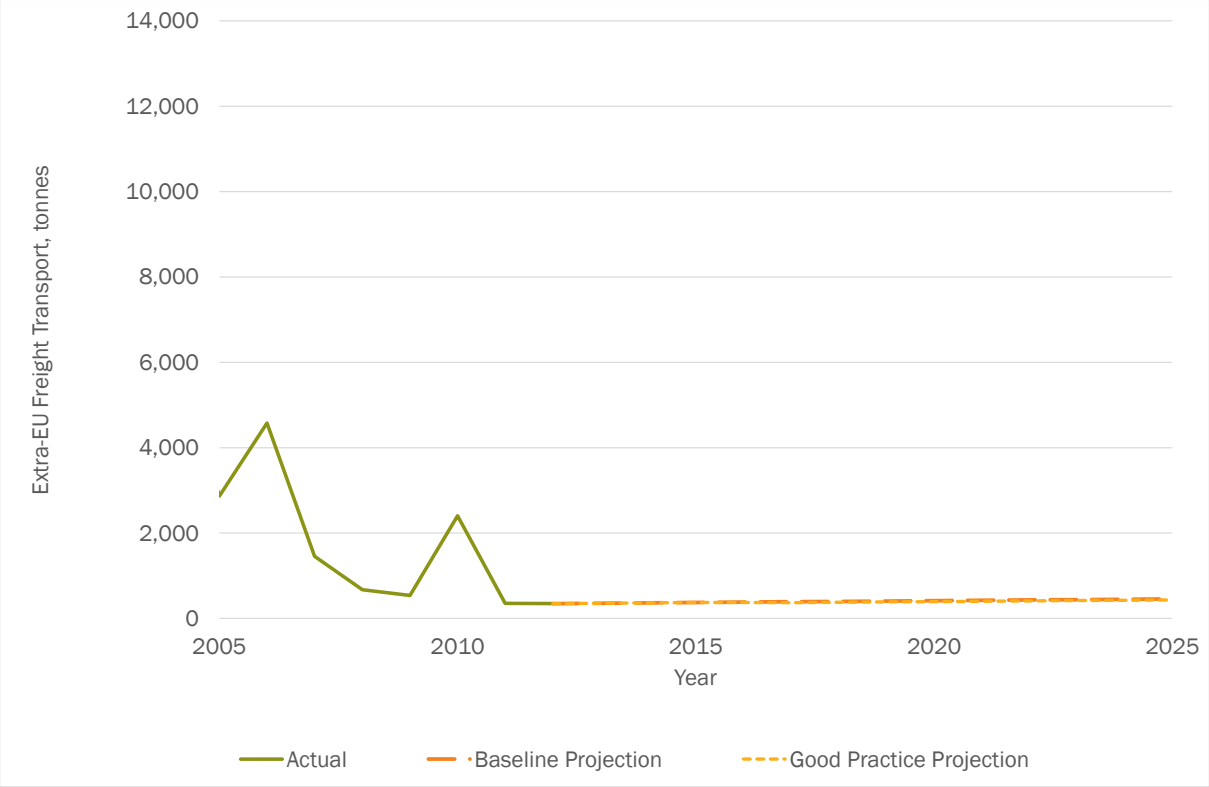


Figure 312: Change in Non-Hazardous Waste Landfilled, thousand tonnes

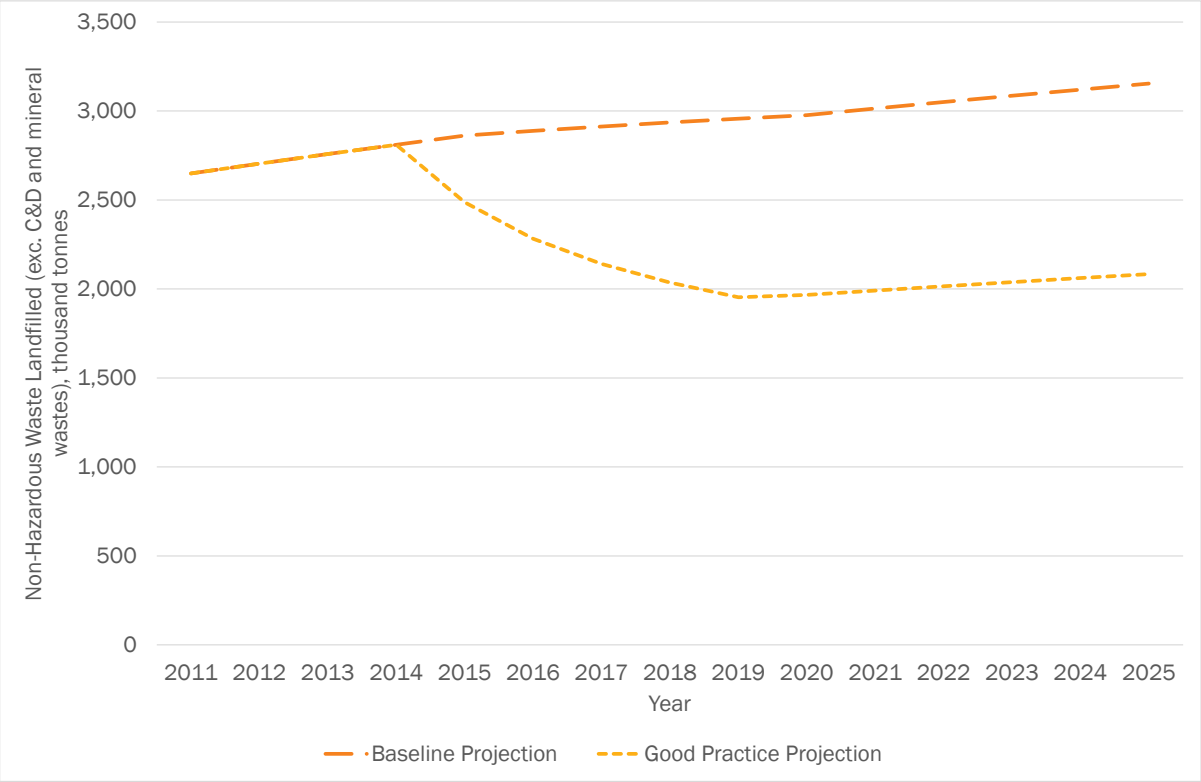


Figure 313: Change in MBT/ Incineration, thousand tonnes

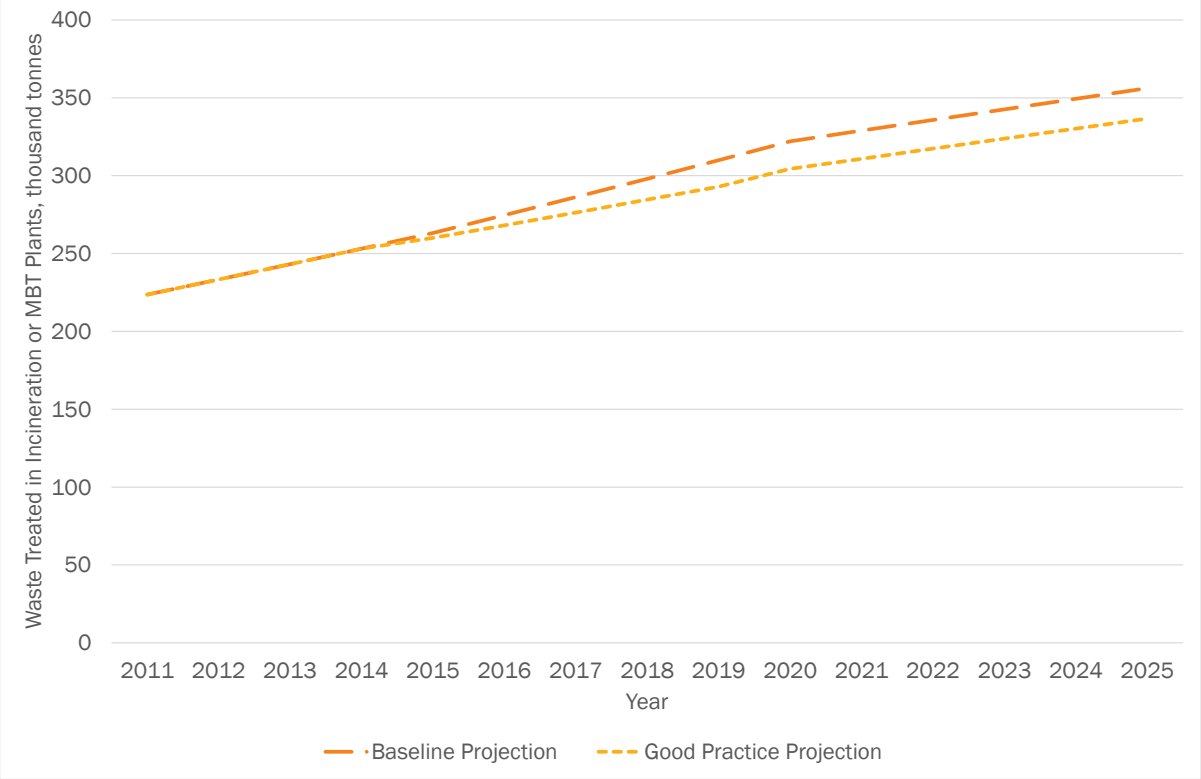


Figure 314: Change in SOx Emissions, tonnes

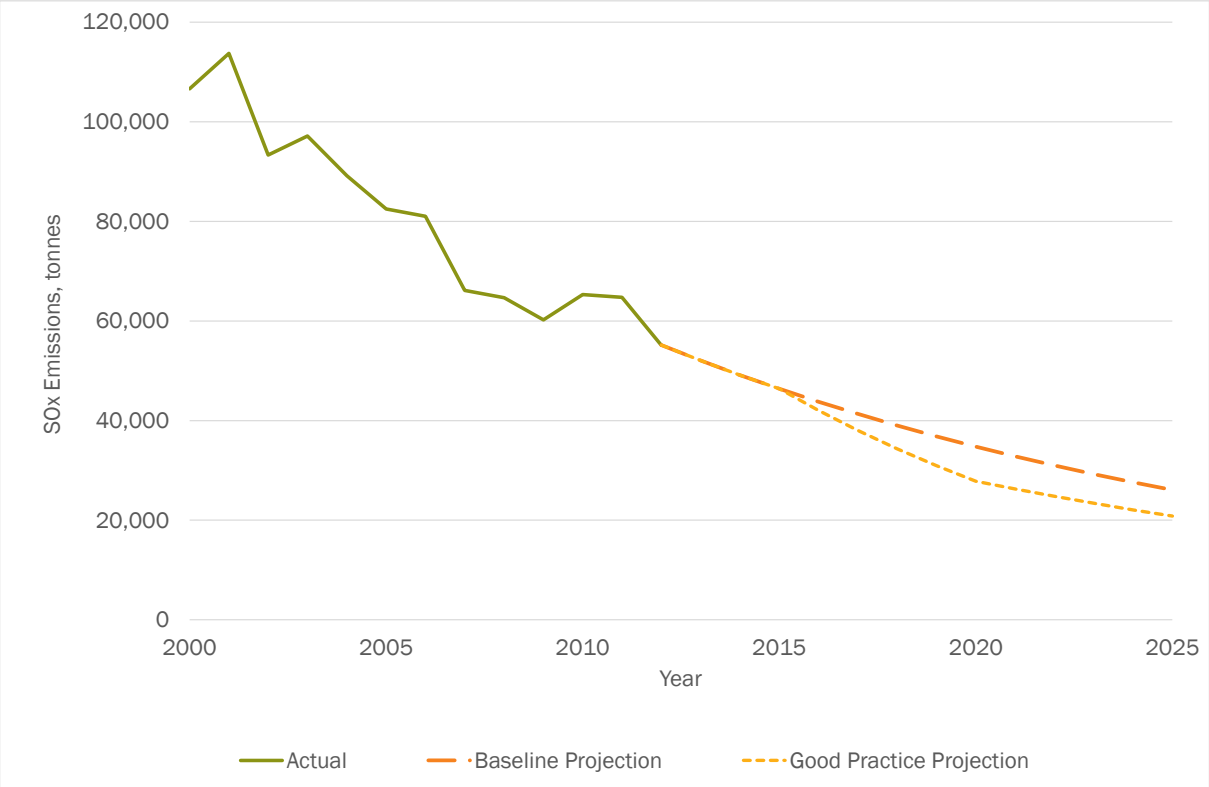


Figure 315: Change in NOx Emissions, tonnes

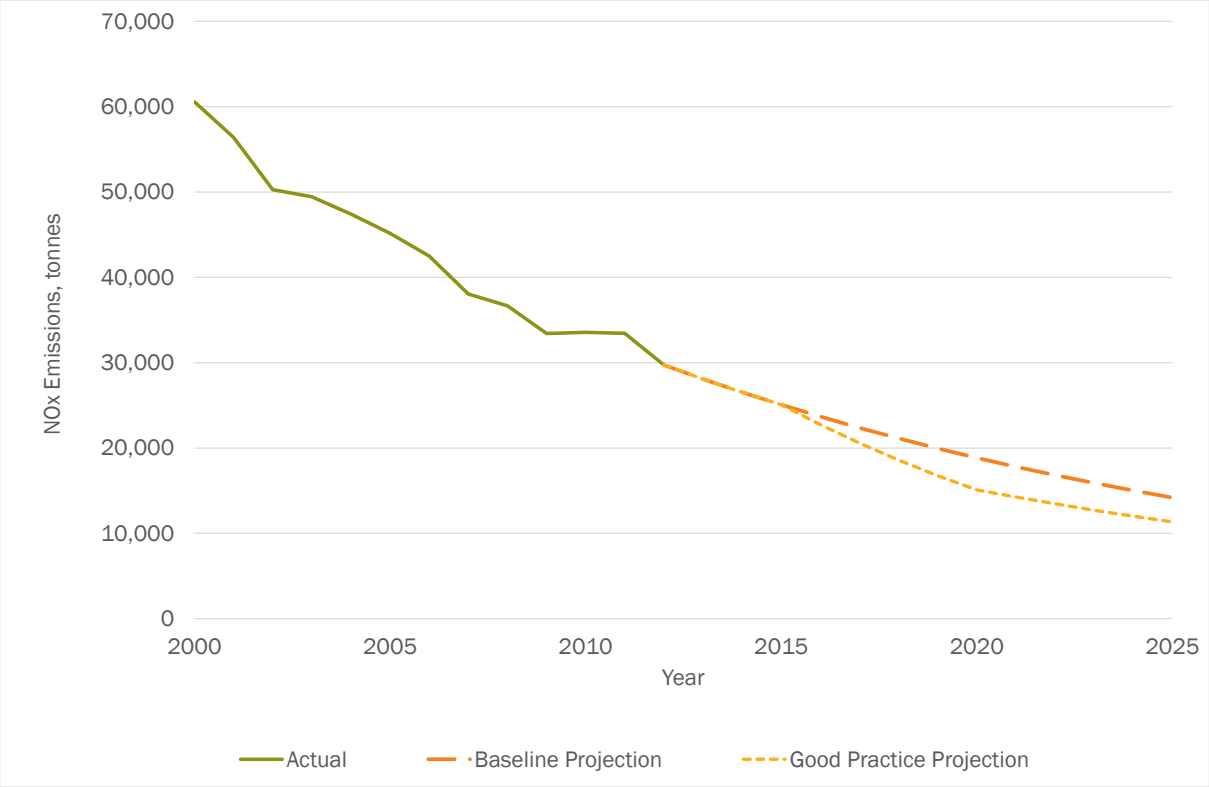


Figure 316: Change in PM_{10} Emissions, tonnes

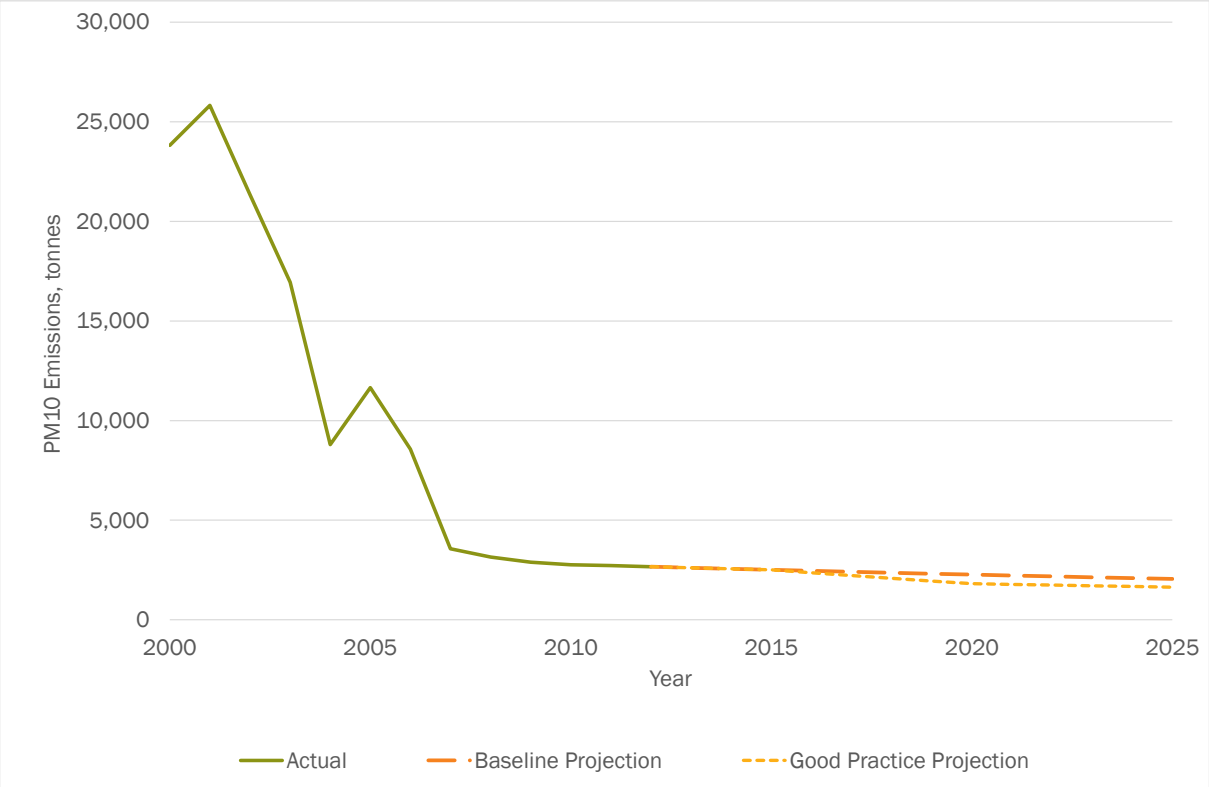


Figure 317: Change in Groundwater Abstraction – Public Supply, million cubic metres

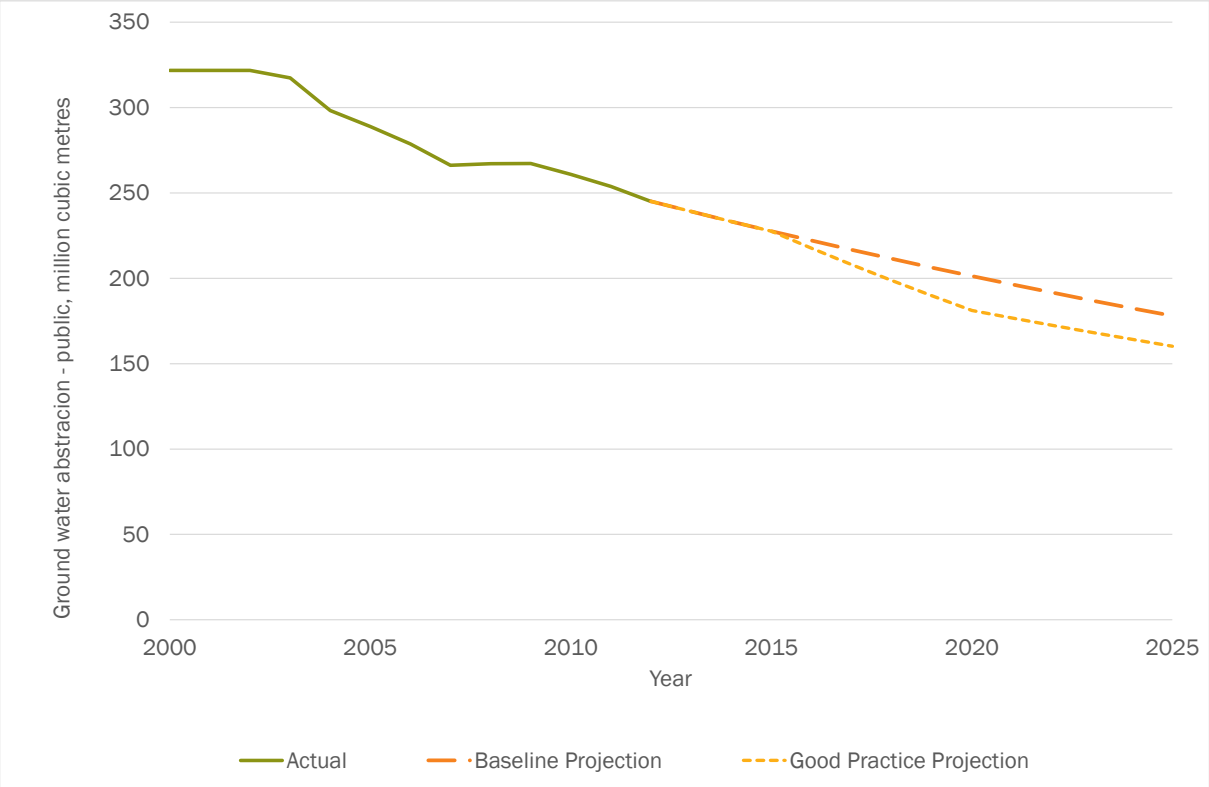


Figure 318: Change in Groundwater Abstraction – Manufacturing, million cubic metres

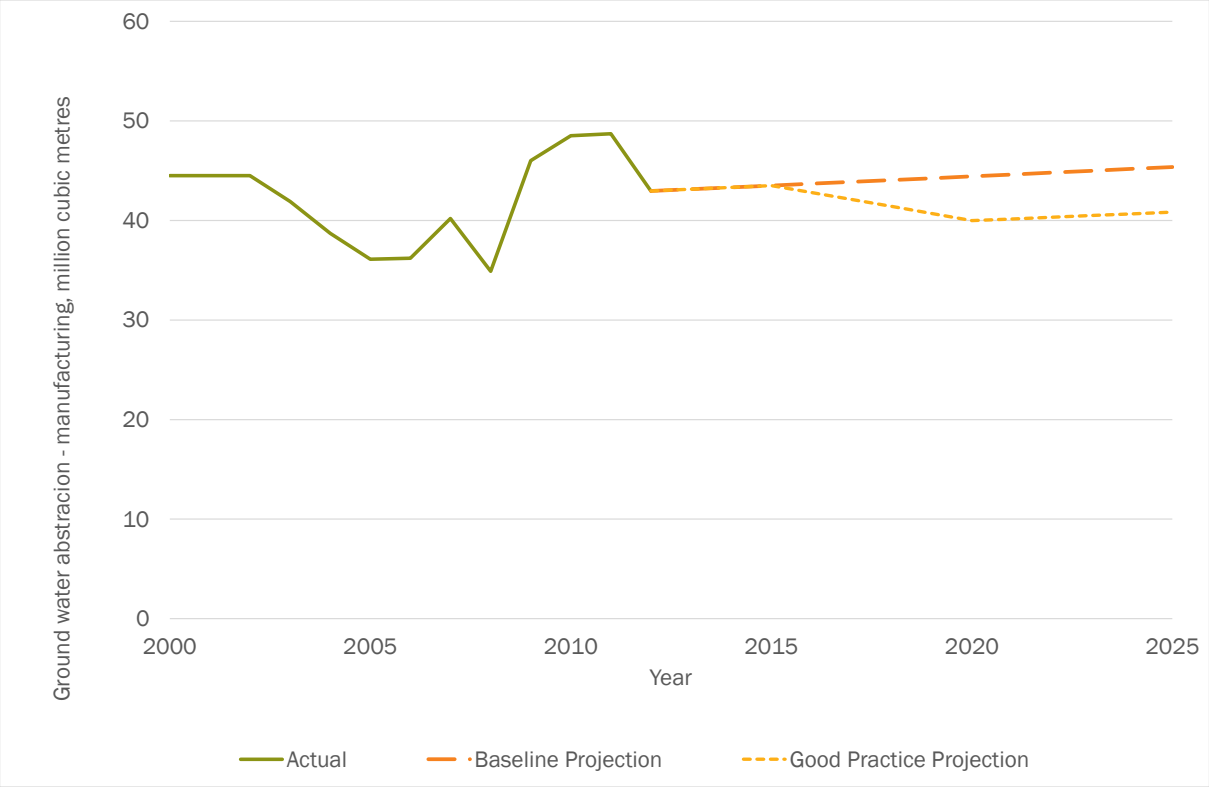


Figure 319: Change in Groundwater Abstraction – Agriculture, million cubic metres

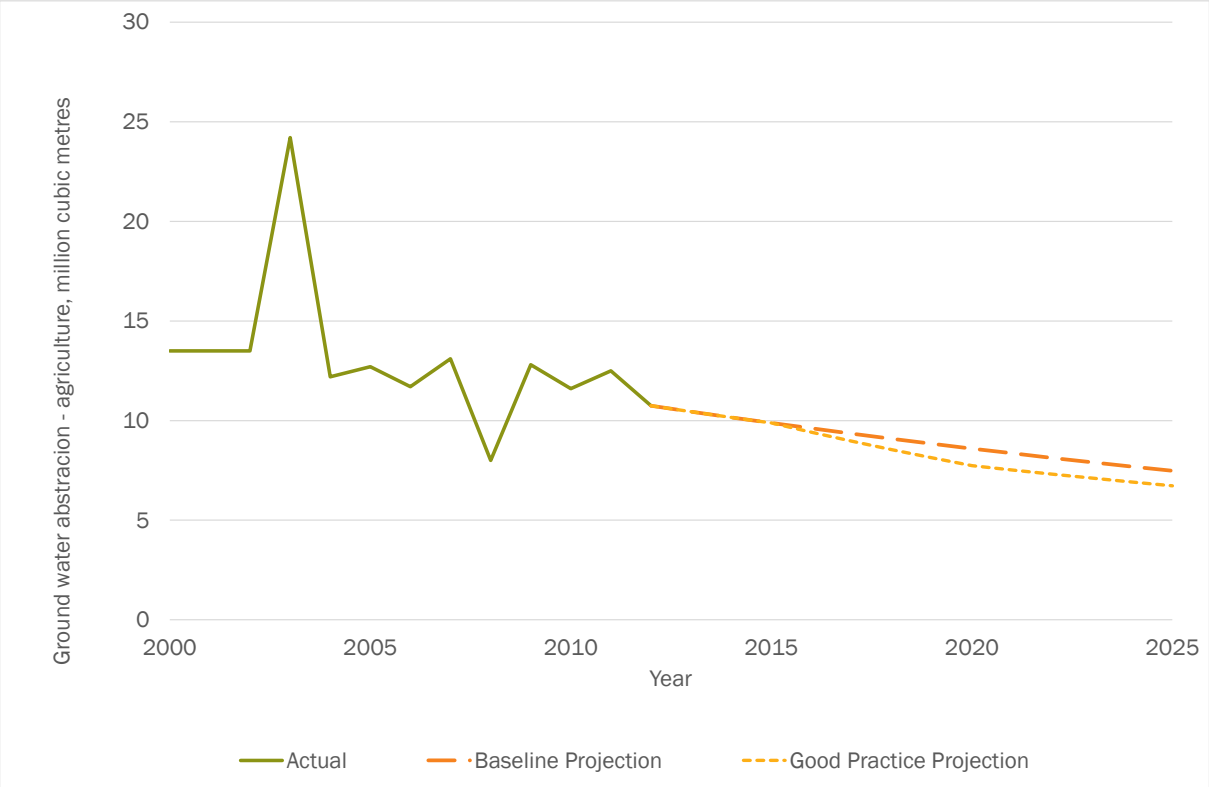


Figure 320: Change in Surface Water Abstraction – Public Supply, million cubic metres

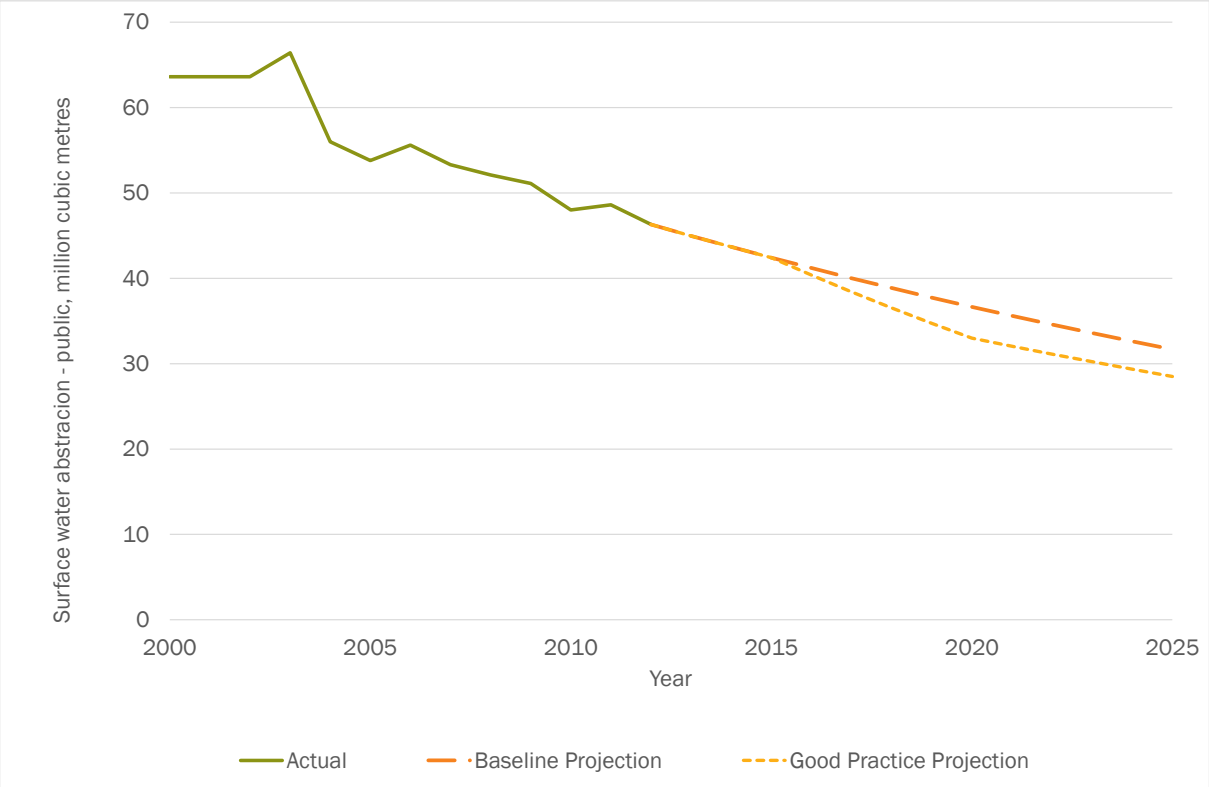


Figure 321: Change in Surface Water Abstraction – Manufacturing, million cubic metres

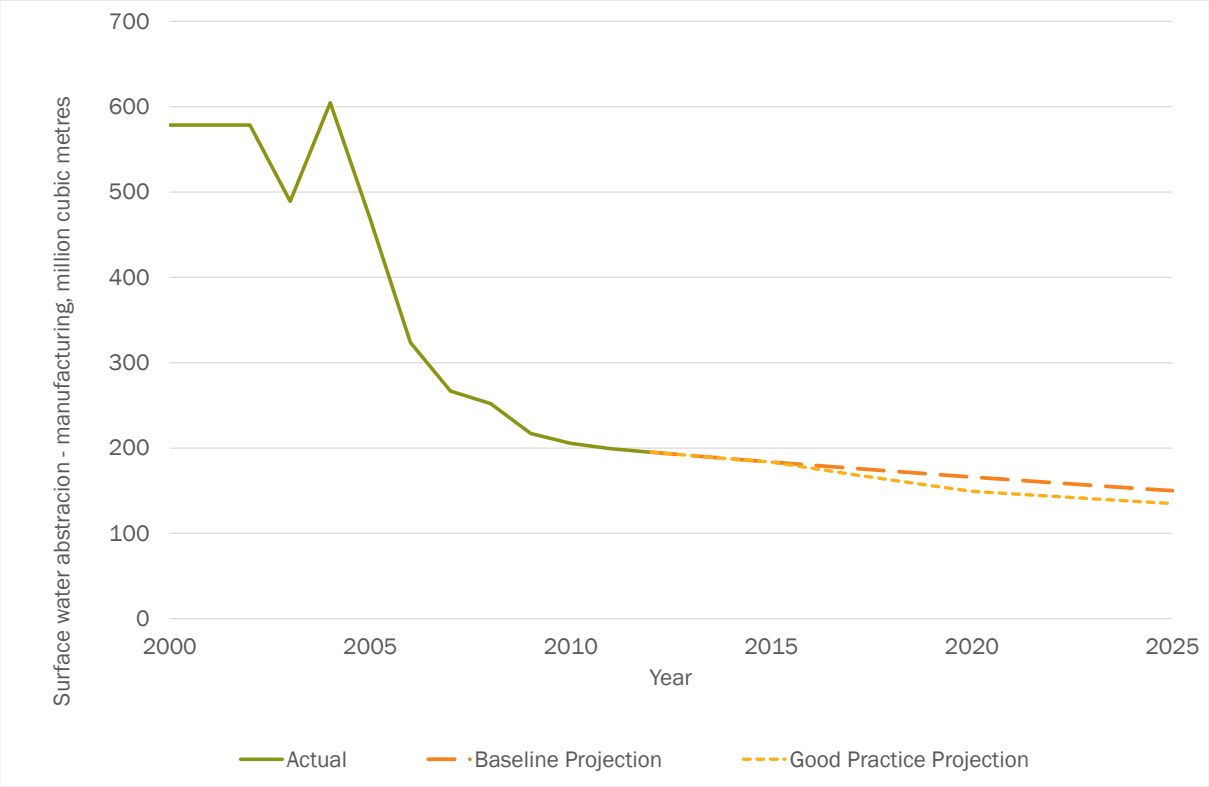


Figure 322: Change in Surface Water Abstraction – Agriculture, million cubic metres

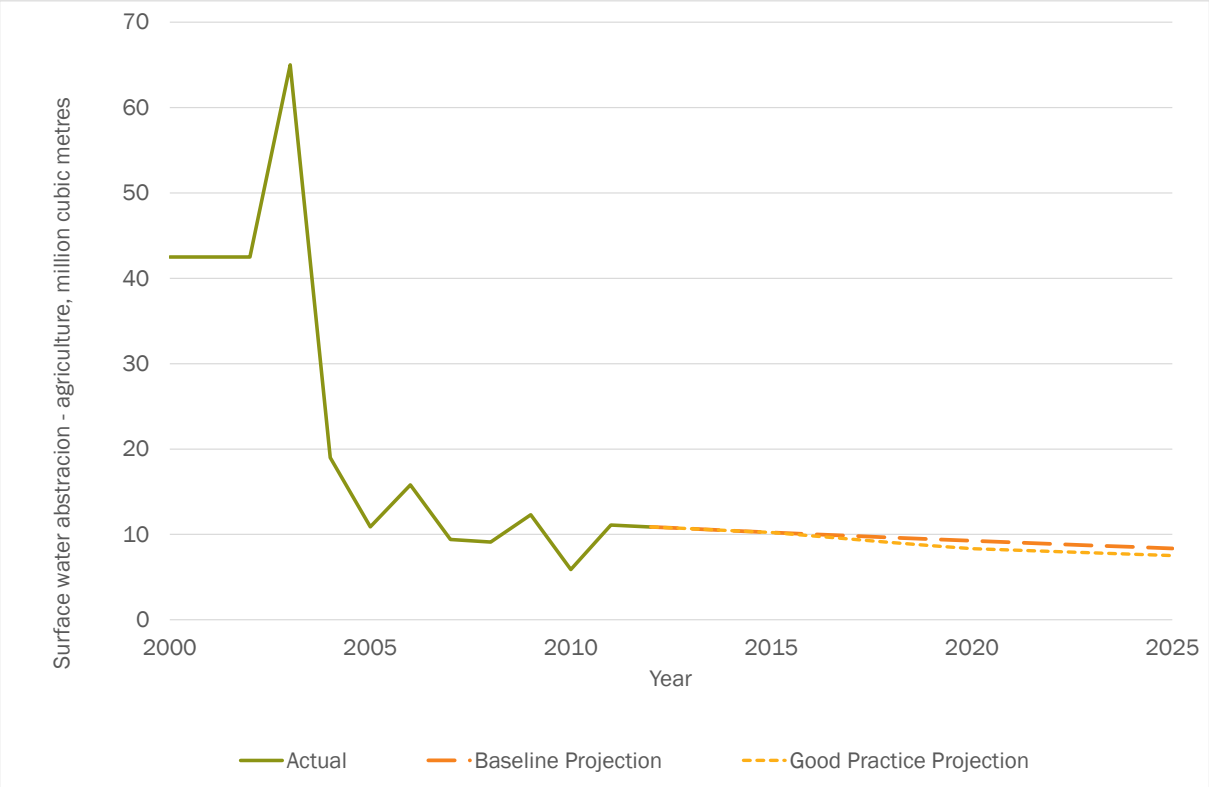


Figure 323: Change in Active Ingredients in Pesticides, tonnes

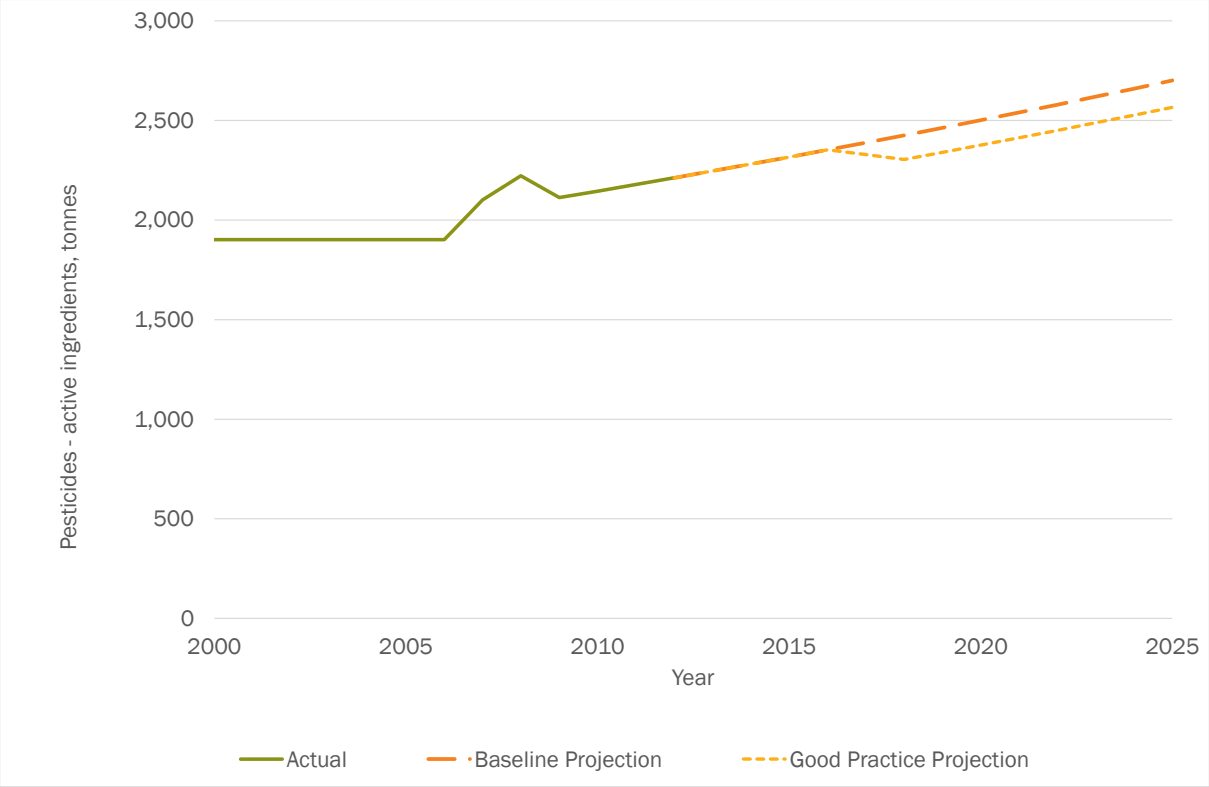


Figure 324: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

Figure 325: Change in Aggregates Extraction, thousand tonnes

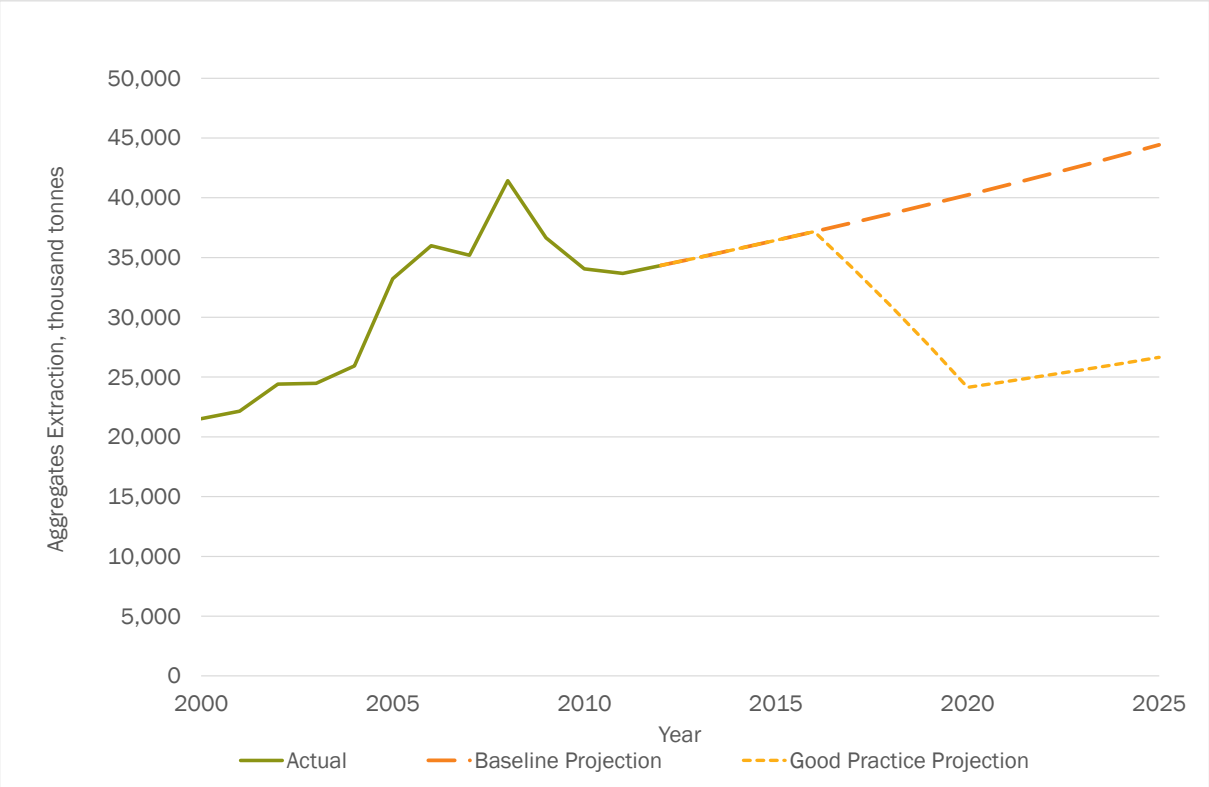


Figure 326: Change in Paper & Card Packaging Generation, thousand tonnes

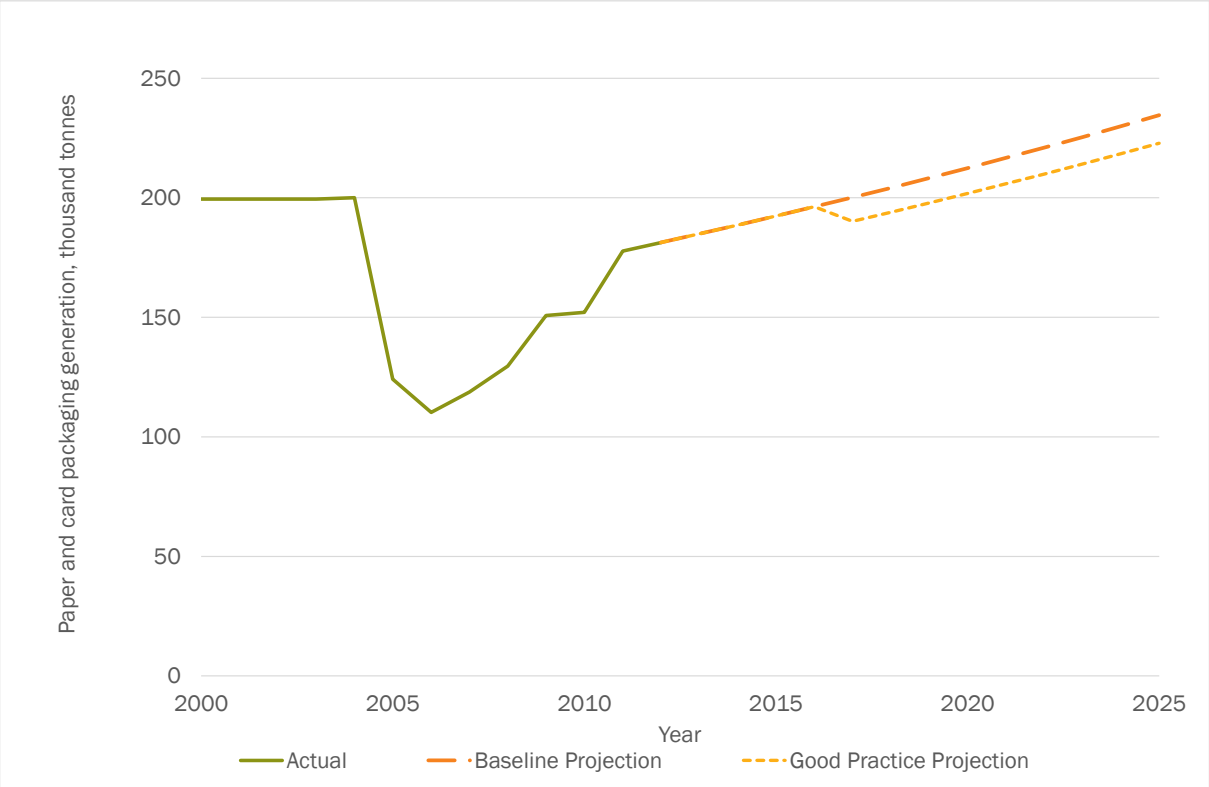


Figure 327: Change in Plastic Packaging Generation, thousand tonnes

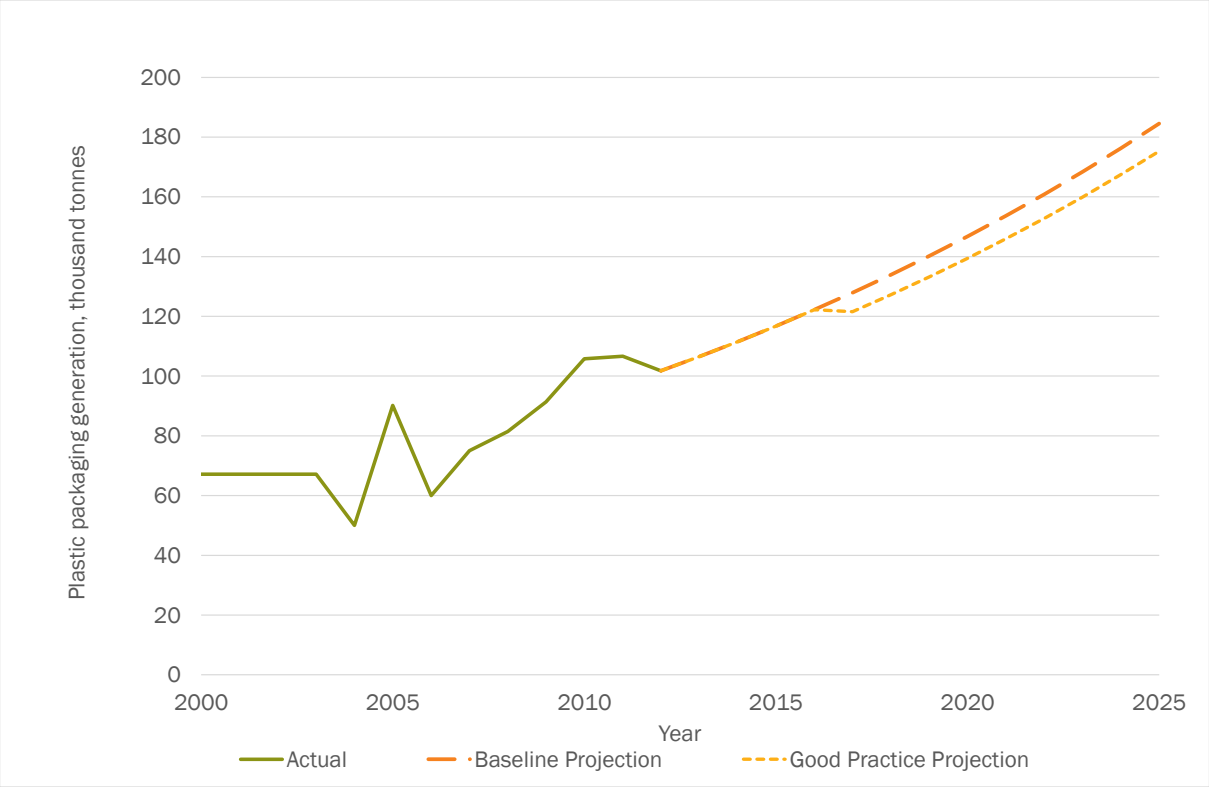


Figure 328: Change in Wood Packaging Generation, thousand tonnes

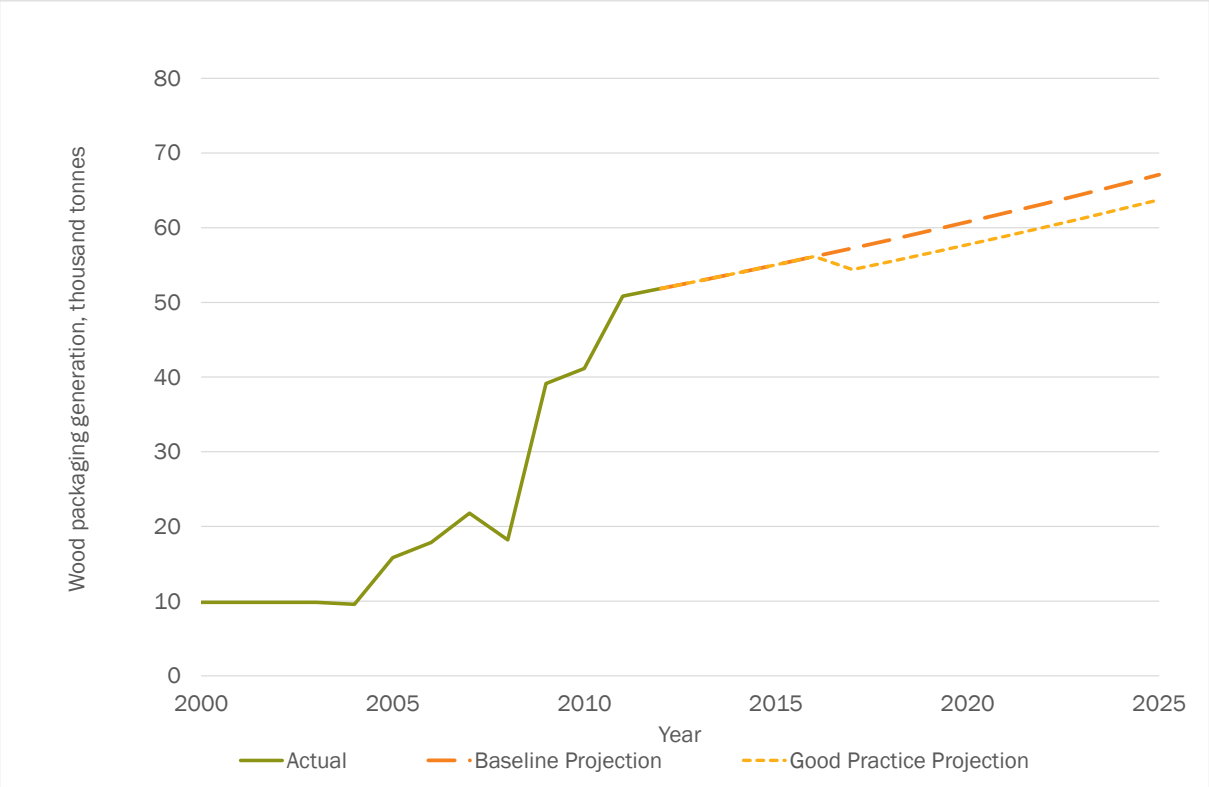


Figure 329: Change in Metal Packaging Generation, thousand tonnes

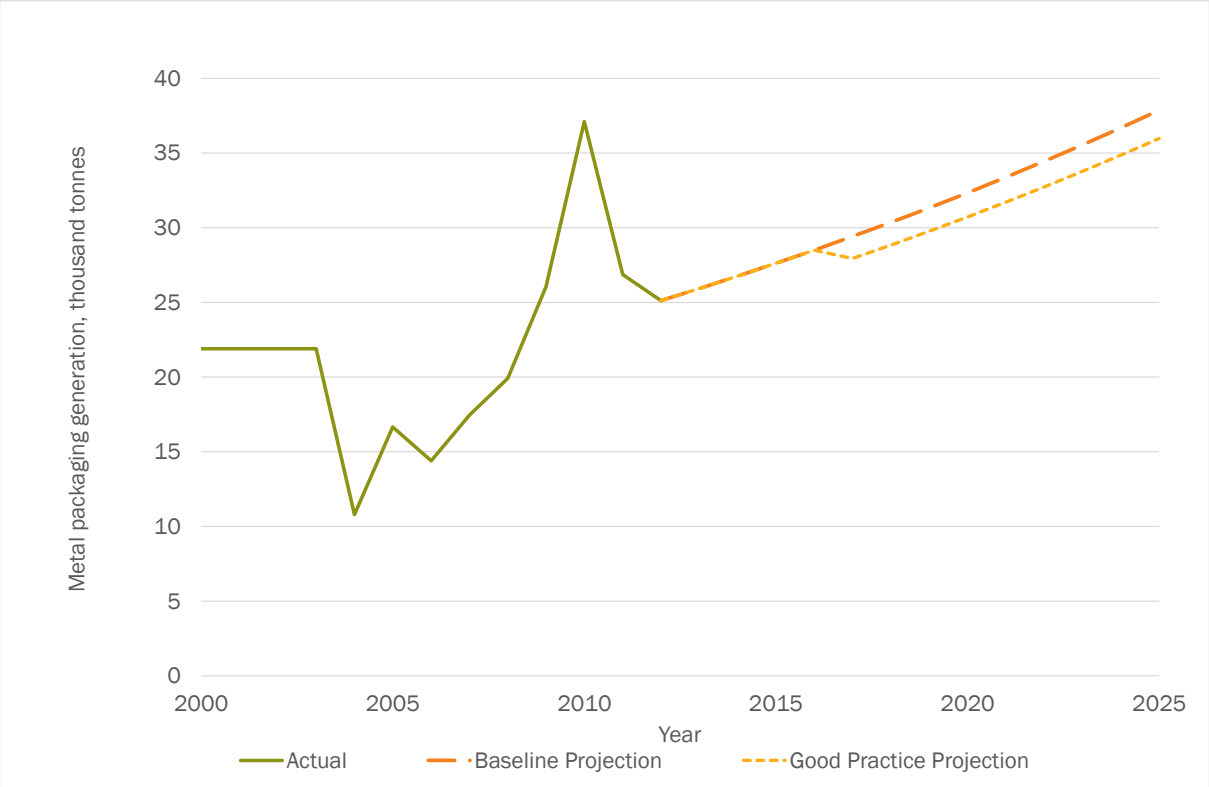


Figure 330: Change in Glass Packaging Generation, thousand tonnes

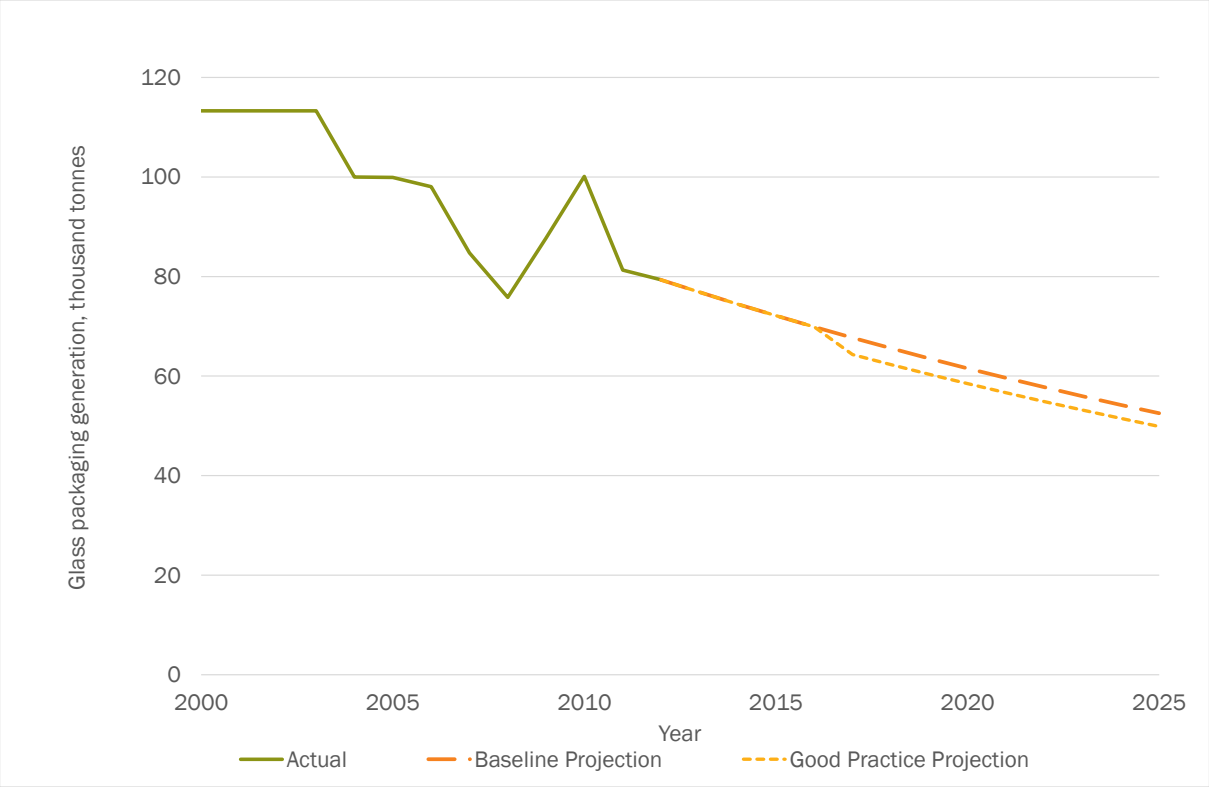
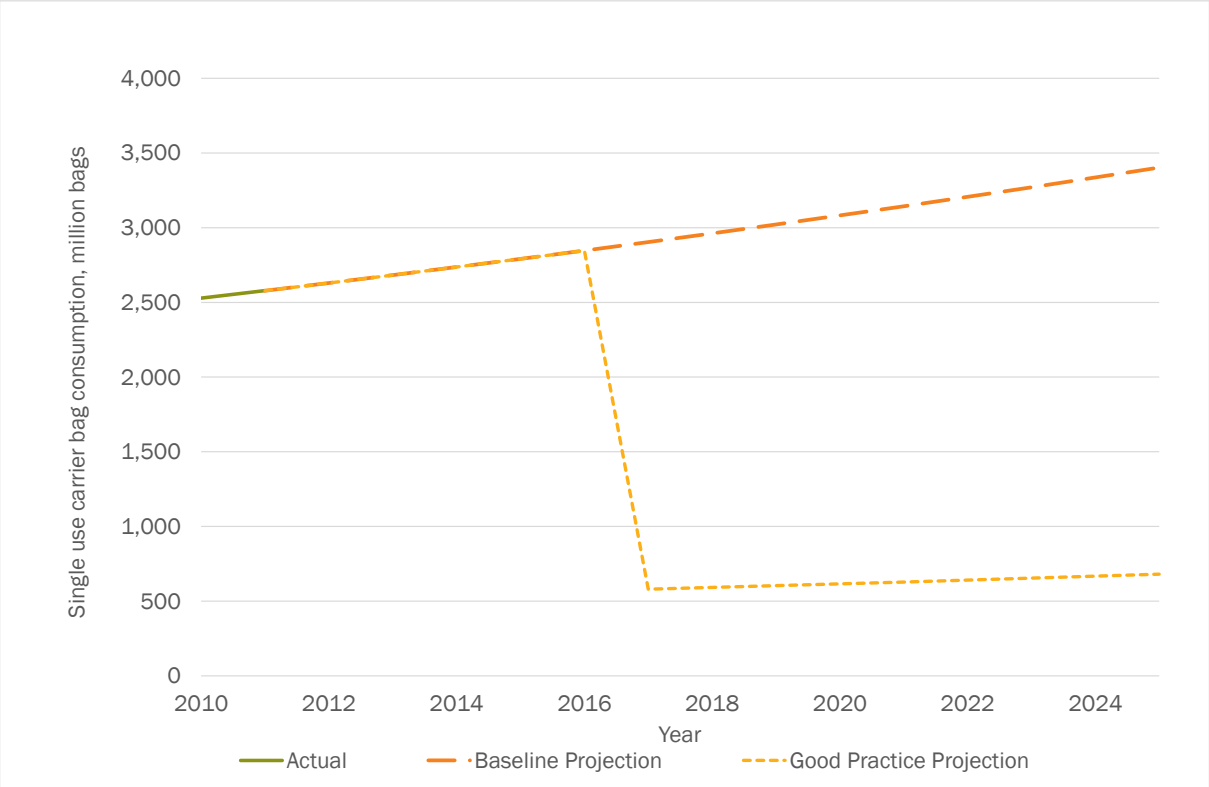


Figure 331: Change in Consumption of Single Use Carrier Bags, million bags



A.16.6 Full Revenue Outputs

Table 248: Revenue Outturns from Model, million EUR (real 2013 terms)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy	Transport fuels	0	0	36	72	108	143	178	213	247	281	281	281
	C&I / Heating	0	0	70	137	201	263	324	382	439	495	495	495
	Electricity	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million EUR	*0*	*0*	*106*	*209*	*309*	*407*	*502*	*595*	*686*	*775*	*775*	*775*
	Sub-total Energy, % GDP	*0.0%*	*0.0%*	*0.1%*	*0.3%*	*0.4%*	*0.5%*	*0.6%*	*0.7%*	*0.7%*	*0.8%*	*0.8%*	*0.8%*
Transport (excl. transport fuels)	Vehicle Taxes	0	0	112	227	346	469	634	652	671	690	710	731
	Passenger Aviation Tax	0	0	25	48	49	49	50	50	50	51	51	52
	Freight Aviation Tax	0	0	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
	Sub-total Transport, million EUR	*0*	*0*	*137*	*276*	*395*	*518*	*683*	*702*	*721*	*741*	*761*	*783*
	Sub-total Transport, % GDP	*0.0%*	*0.0%*	*0.2%*	*0.3%*	*0.5%*	*0.6%*	*0.8%*	*0.8%*	*0.8%*	*0.8%*	*0.8%*	*0.8%*
Pollution & Resource	Landfill Tax - Non-haz (excl. C&D)	0	18	34	49	63	76	76	77	78	79	80	81

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	1	2	2	3	4	5	5	5	5	5	5
	Air Pollution Tax	0	14	26	35	42	48	43	41	39	37	35	33
	Water Abstraction Tax	0	7	14	20	26	31	30	29	29	28	27	27
	Waste Water Tax	0	14	26	38	37	37	37	37	37	37	37	37
	Pesticides Tax	0	0	6	12	12	12	12	12	12	12	13	13
	Aggregates Tax	0	0	89	82	74	66	58	59	60	61	63	64
	Packaging Tax	0	0	16	16	16	17	17	18	18	19	20	20
	Single Use Bag Tax	0	48	49	10	10	10	11	11	11	11	11	12
	Fertiliser Tax	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
	Sub-total Pollution & Resource, million EUR	*0*	*102*	*262*	*265*	*284*	*301*	*288*	*288*	*289*	*289*	*290*	*291*
	Sub-total Pollution & Resource, % GDP	*0.0%*	*0.1%*	*0.3%*	*0.3%*	*0.3%*	*0.4%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*
	Total, million EUR	0	102	505	750	988	1,226	1,473	1,585	1,696	1,806	1,827	1,849

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Total, % GDP	0.0%	0.1%	0.6%	0.9%	1.2%	1.4%	1.7%	1.7%	1.8%	1.9%	1.8%	1.8%