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Progress with the method for making early CO_2 emission estimates based on Eurostat monthly energy data

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List of Abbreviations

CO_2	Carbon dioxide
CRF	Common Reporting Format
EU	European Union
GCV	Gross calorific value
Gg	Gigagram = 10^9 g = 1 kt (kiloton) = 1000 tons
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
kt	Kiloton (1 kt = 1000 t)
MS	Member State
NCV	Net calorific value
NIR	National inventory report
QA/QC	Quality assurance and quality control
TJ	Terajoule
UNFCCC	United Nations Framework Convention on Climate Change

Summary

A method was developed to calculate early CO_2 emissions from the energy sector for the EU and its Member States based on Eurostat monthly energy data. With this method, the CO_2 emissions are calculated four to five months after the reference year, which is about one year earlier than final CO_2 emissions reported in national GHG inventories submitted to the UNFCCC.

The method is based on the trend changes of the fuel consumption for aggregated fuel categories (liquid fuels, solid fuels and gaseous fuels) of Eurostat monthly energy data. The project "Verification of the suitability of the method proposed to produce early CO_2 emission estimates" (2012/S136-226071) has been used to perform a thorough examination of the suitability of the proposed method over a longer time period. Estimates for early CO_2 emissions have been calculated for the years 2012, 2013 and 2014. The application of the trend method to estimate early CO_2 emissions for all EU Member States represents a robust procedure that adjusts systematic errors of under- or overreporting in monthly data.

Verifications of the CO_2 estimates are included for the year 2011 (results from the last project - tender 2010/S 66-098319) and for the years 2012 and 2013. The results of early CO_2 estimates are compared with CO_2 emission data reported in the Member States' GHG inventory submissions to the UNFCCC (CRF Table 1.A.b Reference Approach), which become available approximately one year later. During the duration of this project CO_2 emission data from Member States GHG inventories became available for reference years 2011, 2012 and 2013. A verification of the 2014 CO_2 estimates could not be performed within this project, as GHG inventories became available only at the end of 2015.

The comparison of the results shows that the closeness of the early CO_2 estimates to the CO_2 emission data from GHG inventories continously improved over the years. This is due to improvements in the reporting of Eurostat monthly energy data.

An analysis of the quality of the Eurostat monthly energy data on fuel consumption used for calculating CO_2 emissions is carried out by comparing annual and monthly Eurostat energy data and energy data used in the Member States' GHG inventories for the years 2008–2013. This analysis shows that the data quality varies throughout the years for all fuels and in most countries. However, over the duration of the current project and especially since 2013, the quality of the monthly data seems to have improved, which further contributes to the suitability of the trend change method. The improvements in the monthly reporting are a further step towards a harmonised method. In order to apply a harmonised method to all EU Member States without correcting or updating any monthly data, a sufficient quality of monthly data is needed for all years.

1. Introduction and background

In order to improve the timeliness of the EU carbon dioxide emissions data, Eurostat initiated an action five years ago called “Early Estimates of CO_2 Emissions”. The aim is to provide estimates of CO_2 emissions from energy use (combustion of fossil fuels) only four to five months after the reference year (t+4), instead of the usual 16 months. These first estimates are based on a harmonised method and monthly energy statistics already available through the Energy Statistics Regulation. This information is particularly relevant because CO_2 emissions from fossil fuel combustion make up nearly 80% of the total emissions and, on average, around 80% of the annual change in EU greenhouse gas emissions.

The first objective of this project was to test whether the trend method developed to estimate early CO_2 emissions continues to produce valuable results based on the use of monthly energy data. For this purpose, early CO_2 estimates at t+4 months were calculated in April of the years 2012, 2013 and 2014. This is about one year earlier than official submissions of GHG inventory data by Member States to the UNFCCC. In addition, the early CO_2 estimates calculated were verified by comparison with subsequent official CO_2 emission data reported in the GHG inventory submissions to the UNFCCC under CRF table 1.A (b)[1].

The second objective of this project was to analyse the quality level of monthly Eurostat energy data on fuel consumption compared to annual Eurostat data and to energy data used by Member States for the GHG inventory. Based on this comparison it was assessed whether the quality of these data improved compared to data for the years 2008-2012 and in which areas substantial deviations continue to occur.

This report includes a description of the method used, a verification of the early CO_2 emission estimates for the years 2011-2013 by comparing them to the final GHG inventory CO_2 emission data submitted to the UNFCCC and the calculation of the 2014 early CO_2 emission estimates. Finally a data evaluation of the monthly fuel consumption data for the years 2008-2013 based on a comparison with annual Eurostat data and fuel consumption data used in Member States’ GHG inventories was carried out.

[1] CRF (Common Reporting Format) table 1.A (b) SECTORAL BACKGROUND DATA FOR ENERGY: CO_2 from Fuel Combustion Activities - Reference Approach (IPCC Worksheet 1-1), Common Reporting Format - a set of standardised spread sheet data tables containing mainly numerical information and submitted electronically. These form one component of annual inventory submissions to the EU and the UNFCCC.

2. Method for early CO_2 estimates

2.1. Calculating early CO_2 emissions from fossil fuel combustion based on Eurostat monthly energy data

2.1.1. Method to calculate early CO_2 emission estimates

The method used to calculate early CO_2 estimates is based on the reported IPCC (2006) reference approach for the CO_2 emissions from fuel consumption of EU Member States and uses up-to-date Eurostat monthly energy data on fuel consumption.

The method estimates the consumption of cumulated liquid fuels, solid fuels, peat and gaseous fuels for the previous year and the year before and calculates the trend changes of consumption by dividing the year t-1 by the year t-2. The trend changes for liquid, solid, gaseous fuels and peat consumption are applied to the CO_2 emissions of the same aggregate fuel categories of the latest available reported year in Member States' GHG inventories as reported in the CRF reference approach table 1.A.(b) [2].

The first step in this method calculates the percentage change in the consumption of fossil fuels over the last two years for solid, liquid, gaseous fuels and peat for each Member State on the basis of Eurostat monthly energy data in kilotons (kt). According to the methodology for the IPCC reference approach, fossil fuel consumption is calculated differently for primary and for secondary fuels and also differs from the concept of calculating gross inland consumption calculated by Eurostat:

Apparent consumption for primary fuels (IPCC): production + imports – exports – stock change.

Apparent consumption for secondary fuels (IPCC): imports – exports – stock changes – international marine and aviation bunkers.

This definition differs from the calculated gross inland consumption calculated by Eurostat under the flow code B_100900.

- Recovered products etc. are not taken into account under the IPCC definition.
- International aviation bunkers (production code 101931 for annual and production code: 105121 for Eurostat monthly energy data) are subtracted from the apparent consumption following the IPCC definition.

Biofuels should not be included in the calculation of the apparent consumption for liquid fuels, as the emission factor for biofuels is zero[3].

In the second step the percentage changes are applied to the published CO_2 fuel combustion emissions for the most recent year available, as reported by Member States to the UNFCCC as part of their GHG inventories in CRF table 1.A (b), which is the reference approach calculation of CO_2 emissions.

The CO_2 emission estimate calculations are conducted for each fossil fuel group, for each Member State to construct early CO_2 estimates for each year from 2012 to 2014. The sum of Member States' CO_2 emissions then represents energy sector emissions for the EU-28[4].

[2] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php
[3] Due to inconsistencies in reporting in all Member States, it has not been possible to subtract biofuels in the calculation of the years 2012 and 2013.
[4] EU-27 for 2011 and 2012.

Equation 1

$$E^{Y}_{CO2} = \frac{C^{Y}_{solid}}{C^{Y-1}_{solid}} \cdot E^{Y-1}_{solid,CO2} + \frac{C^{Y}_{peat}}{C^{Y-1}_{peat}} \cdot E^{Y-1}_{peat,CO2} + \frac{C^{Y}_{liquid}}{C^{Y-1}_{liquid}} \cdot E^{Y-1}_{liquid,CO2} + \frac{C^{Y}_{gaseous}}{C^{Y-1}_{gaseous}} \cdot E^{Y-1}_{gaseous,CO2}$$

with

E^{Y}_{CO2} CO_2 *emissions in reference approach table 1A(b)*

$C^{Y}_{solid/peat/liquid/gaseous}$ *consumption of solid/peat/liquid/gaseous fuels*

$C^{Y-1}_{solid/peat/liquid/gaseous}$ *consumption of solid/peat/liquid/gaseous fuels in the previous year*

$E^{Y-1}_{...,CO2}$ CO_2 *emissions in the respective fuel category in the previous year*

The advantage of the method is the simplicity that ensures a fast and straightforward calculation for each Member State and better results than a bottom-up calculation of CO_2 emissions based on Eurostat monthly energy data and fuel-specific emission factors for each Member State. The trend change method also means that discrepancies between the Eurostat monthly energy data and energy data used in the GHG inventories are smoothed out when such discrepancies persist through the entire time series of fuel consumption data.

On the other hand the application of the trend change method requires consistent reporting of monthly data for two consecutive years. Any changes and also improvements in the data may affect the trend change method in a negative way, leading to higher deviations between early CO_2 estimates and CO_2 emission data reported in the GHG inventories.

During the course of the project several refinements of the method have been introduced:

- The implementation of two separate calculation methods – one using Eurostat data in physical units (tons) and one calculating trend changes in energy units (TJ) – and the comparison of the results of both methods. For some countries calculated trend changes in physical units (kt) and calculated trend changes in energy units (TJ) showed larger differences. This is due to the fact that countries changed the share of consumption between solid fuel categories with different net calorific values like hard coal and lignite. For countries with large differences between the two methods, the results of the calculation based on energy units (TJ) were used for the calculation of trend changes for solid fuels to calculate early CO_2 estimates.
- In addition gap filling methods have been developed and implemented for specific Member States for which Eurostat monthly energy data are substantially incomplete (e.g. for Ireland).
- In the case of some Member States for which the quality of the monthly data for the first of the two years is insufficient and not consistent with the data quality of the second year, data for the first year might be replaced by annual data, e.g. if international aviation bunkers are only reported in the year 2014 and not in the year 2013 instead of using monthly data for the year 2013, annual data on international bunkers for 2013 have been used for gap filling.

2.1.2. Changes due to the implementation of the 2006 IPCC Guidelines

For the reporting year 2013 the implementation of the 2006 IPCC Guidelines became mandatory for each Member State. The differences between the reference approach in the 2006 IPCC Guidelines and in the 1996 IPCC Guidelines are as follows:

- In the 2006 IPCC Guidelines two new emission categories (Waste (non-biomass fraction) and other fossil fuels) were included. Under Eurostat monthly energy data no data on waste and other fossils is available. By comparing the total CO_2 emissions for 2013 calculated as early estimates and the inventory calculations it is unclear if countries already reported emissions of the new categories in their old submissions under other categories. Denmark is the only country that already reported CO_2 emissions from fossil waste under emissions from solid fuels in their reference approach table 1.A(b).
- Since 2015 peat has become a separate fuel category in the reference approach calculation in the GHG inventory and is no longer included under solid fuels. The calculation of the early CO_2 estimates has been adapted to incorporate this change.
- Different default IPCC NCVs for fuels and default IPCC carbon emission factors are used (IPCC 2006 GL, Volume 2, table 2.2-2.5 and 3.2.1).
- Changes in carbon stored and excluded:
    - Reductants in the iron and steel industry (coke and petroleum coke): quantities of coke delivered for the iron and steel and non-ferrous metals industries should be excluded from total carbon in the reference approach in the 2006 IPCC Guidelines.
    - Non-energy fuel use: all delivery of lubricants should be excluded from the reference approach (even if combusted in 2-stroke engines).
    - Feedstocks: (Naphtha, LPG, refinery gas etc.): all deliveries to petrochemical feedstocks should be excluded, not subtracting products that later go into combustion.
- New default values for fractions of C stored are provided.
- Changes in the default value for the fraction of carbon oxidized (changed from 0.99 to 1).

Thus, there are various changes related to the implementation of the 2006 IPCC Guidelines. Not all Member States calculations are affected by the changes of the IPCC methodology. When Member States have been using country-specific values for NCVs, fraction of carbon stored, fraction of carbon oxidized etc. and not the previous IPCC default values (1996 IPCC Guidelines), there will not be large changes compared to the previous submission. Changes will only be related to the reporting of emissions of the two new categories and the implementation of differences in carbon stored. The changes in the 2006 IPCC Guidelines increase the differences between early CO_2 estimates and CO_2 emission data reported in the GHG inventories for the year 2013 if comparison is based on total CO_2 emissions in kt. The differences on country level are in most cases related to changes in the methodology and reflected in the recalculations. Only for a few Member States are the differences based on the differences in the fuel consumption data reported under Eurostat monthly energy data and fuel consumption data used in the GHG inventories. Due to the changes in the inventory data a comparison on the basis of total CO_2 emissions in kt is not conclusive. Therefore, the comparison is based on trend changes calculated for CO_2 emissions from fossil fuel combustion.

2.1.3. Allocation of fuels from monthly data

The method requires an accurate correspondence of fuel categories between Eurostat monthly data, Eurostat annual data and the fuel consumption data used in the GHG inventories reported in the CRF table 1.A.(b).

The following fuels are not provided in Eurostat monthly data at the level of disaggregation required by the IPCC reference approach:

- Orimulsion is not reported separately in the Eurostat monthly energy data, but reported under 'Other hydrocarbons' in Eurostat monthly energy data.
- Shale oil is not reported separately in the Eurostat monthly energy data, but reported under 'Other hydrocarbons' in Eurostat monthly energy data.
- Bitumen and lubricants are not reported individually, but are included under 'Other products' in Eurostat monthly energy data.
- Hard coal is reported as an aggregate category in Eurostat monthly energy data covering anthracite, coking coal, other bituminous coal and sub-bituminous coal.
- Oil shale and oil sands are reported under "Lignite".
- Peat is no longer reported under Solid Fuels but as a separate category.
- Eurostat monthly energy data do not include fossil waste whereas the new Eurostat database for annual data and the new reporting under the 2006 IPCC Guidelines CRF table (1.A(b) will include fossil waste as a separate category.
- Monthly and annual Eurostat energy data do not include the category "Other fossil fuels" whereas the new reporting under the IPCC 2006 Guidelines includes this category in the CRF table (1.A(b).

2.1.4. Units of measure / Conversion factors

Eurostat data provide liquid and solid fuel consumption in physical units (mass units) while natural gas is reported in energy units. The calculation of the trend changes used for calculating early CO_2 emissions are therefore based on trend changes in kt for liquid and solid fuels and peat. The trend changes for natural gas consumption are calculated from Terajoule (TJ) based on Net calorific values (NCV).

The energy data on fuel consumption provided in the GHG inventories for the reference approach (CRF Tbale 1.A(b)) are partly available in physical units, but some Member States' fuel consumption data are only available in energy units (TJ) in the CRF table 1.A(b). For the year 2013 13 of the 28 Member States (Czech Republic, Germany, Denmark, Greece, Hungary, Italy, Lithuania, Latvia, Netherlands, Poland, Portugal, Romania, United Kingdom) report fuel consumption data for calculating CO_2 emissions from fuel combustion only in energy units (TJ). For these Member States, fuel consumption data reported in the CRF table 1.A (b) in the GHG inventories were converted to physical mass units (kt) to allow for the comparison with Eurostat monthly and annual fuel consumption data. The Net Calorific Values (NCVs) used for this purpose were taken from Member States' national inventory reports (NIR) as submitted under the UNFCCC, if available. If these were not available, NCVs as reported to Eurostat for annual fuel consumption were used. Neverthless, the selection of NCVs is a source of uncertainty and can affect the comparison of the fuel consumption data; with the regard to the latter, the use of different NCVs can have a large impact on the results, especially for coal consumption. This is only relevant for the comparison of fuel consumption data and the calculation of trend changes in energy units (TJ), which is used as a quality check of the CO_2 emission estimates. The calculation of the early CO_2 emission estimates is not affected by this conversion.

Data for natural gas are provided in Eurostat monthly energy data in TJ based on gross calorific values (GCVs), whereas natural gas consumption reported in the GHG inventories in the CRF

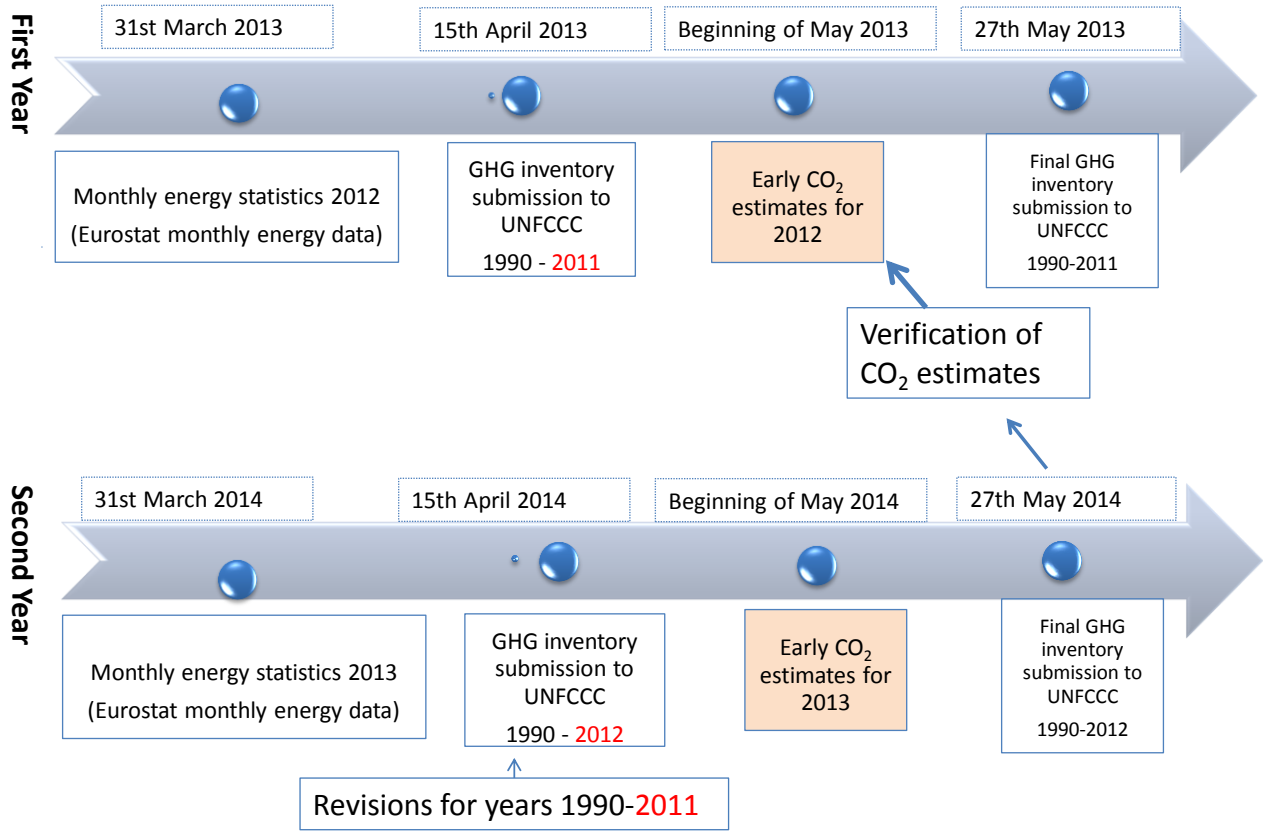
table 1.A(b) are provided in TJ based on NCVs. For the comparison of Eurostat data with GHG inventory data, therefore, Eurostat data was multiplied with the factor 0.9 to convert to TJ NCV.

2.2. Data sources

2.2.1. Availability of data to calculate early CO_2 emissions and for verification of results

The estimation of early CO_2 emissions and the verification of results is based on a specific timeline depending on the availability of data sources used (see Figure 2-1).

Figure 2-1: Availability of data sources, example CO_2 estimate for reference year 2013 and verification of results of the CO_2 estimate for reference year 2012



Source: Authors' own compilation

For estimating CO_2 emissions four months after the reference year for the year 2013, three data sources are used:

1) Eurostat monthly energy data 2012 (as available on 31st March 2013).
2) Eurostat monthly energy data 2013 (as available on 31st March 2014).
3) GHG inventory data for CO_2 emissions for 2012 based on the reference approach (Table 1.A(b)) as available under UNFCCC on 15th April 2014[5].

[5] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php

To assess the quality of the early CO_2 estimates for the year 2012, the following data sources are compared:

1) Early CO_2 estimates for the year 2012
2) GHG inventory data for CO_2 emissions based on the reference approach (Table 1.A(b)) as reported to the UNFCCC for the year 2012 (as available on 27th May 2014)[6].

The closeness of results for the early CO_2 estimate for reference year 2012 can be influenced by different issues. Large differences can be due to:

1) Quality of Eurostat monthly energy data for 2011 (available on 31st March 2012).
2) Quality of Eurostat monthly energy data for 2012 (available on 31st March 2013).
3) Changes in reporting of Eurostat monthly energy data for 2012 in comparison to the reporting of 2011 data (e.g. inclusion of international bunkers in only one of the years, improved reporting) that influences the time series.

Quality of monthly data

To assess the quality of the Eurostat monthly energy data for the year 2012 (as available on 31st March 2013), it is compared with:

1) Annual Eurostat data 2012 (as available in April 2014)
2) GHG inventory data on fuel consumption as reported to the UNFCCC for the year 2012 (as available on 27th May 2014).

This is performed at the level of aggregated fuel consumption in physical units for liquid and solid fuels and in energy units for gaseous fuels. If differences exceed +/- 4 %, a detailed comparison is carried out.

As there are only a few data sources available that provide data as soon as 4 months after the reference year, the quality of the monthly data (for the year t-1) is analysed in terms of completeness, outliers and gaps.

2.2.2. Data revisions

Member States can submit revised data that affect the comparison of energy data on fossil fuel consumption and also the closeness of results of early CO_2 emission estimates. Data revisions can be submitted by Member States during the year and for any historic year for monthly and annual Eurostat energy data as well as for GHG inventory data.

Revision of Eurostat monthly energy data

Within the data preparation and processing for calculating early CO_2 emissions data, checks for the most recent year of Eurostat monthly energy data are carried out. These include checks on completeness, consistency, outliers and gaps. If there are issues identified, Eurostat contacts the Member State(s) and asks for a revision of monthly data. In some cases Member States send a revised set of monthly questionaires that is uploaded to the Eurostat database; in other cases information on revision of monthly data is only provided via email and included manually in the project file.

[6] The inventory submission that becomes available on 27th May will be referred to as the final GHG inventory.

Throughout the year there might be new revisions of monthly data available that are uploaded to the Eurostat database. Thus monthly data for 2011 that has been available in April 2012 might have been revised and is not consistent with monthly data for 2011 available in the database in April 2013.

For the calculation of the 2012 early CO_2 estimates the monthly data for 2011 as available in April 2010 was used.

To analyse the possibility of further improvements of the early CO_2 estimates, the calculation of the CO_2 emissions for the year 2013 was based on revised monthly data 2012 as available in April 2014. According to this extraction from the Eurostat database, revised monthly 2012 data were available for seven Member States. Note that for Belgium, large inconsistencies for natural gas consumption occured in the monthly data for 2012 (as available in April 2013, see Table 5-3) and the revised Eurostat monthly energy data improved the estimates for 2013. Generally, the revisison of monthly data at a later time in the year was mainly a correction of the data to have a better correlation between monthly and annual Eurostat data. Thus the consistency in reporting is not ensured if using revised monthly data that became available later in the year.

To ensure consistency in calculating early CO_2 emissions for the year 2014, the checked monthly data 2013 as available in April 2014 and the checked monthly data 2014 as available in April 2015 were used. Revised monthly data for calculating early CO_2 emissions for later years will not be used for ongoing calculations of early CO_2 emission estimates.

Revision of annual Eurostat data

Member States also revise their annual data and Eurostat incorporates these revised annual data in its database. As annual Eurostat data is only used for verification of the quality of monthly data, revisions of annual data do not have a large effect. A retracing of original annual data (as available in April for the year t-2) used for the comparison with monthly data is not possible, if Member States have revised their annual data.

Revision and recalculation of GHG inventory data

Member States have to report their inventory data to the UNFCCC on the 15th April for the year t-2 including the entire time series beginning in 1990. Until the 27th May Member States have time to make additional changes (error fixing etc.) and submit a final version to the UNFCCC. This final version submitted on the 27th May is reviewed by UNFCCC review experts.

Member States' inventory submissions are based on a quality control and quality assurance system. Additionally, the inventories are reviewed by external review experts from the EU and from the UNFCCC. Therefore, revisions of inventory data are not uncommon. In most cases Member States' inventory submissions include the most recent year (i.e. the data for the year of 2012 is available in Member States' submissions in April 2014) and revised data for the years 1990-2011. This ensures consistent reporting along the time series if new data sources for activity data or new country-specific emission factors become available and are applied consistently to all years in the time series.

Nevertheless, revisions of earlier years than the last one can be substantial. Therefore, data shown in earlier reports of this project might show different figures for the same fuel and the same point in time.

3. Main findings

3.1. Comparisons of early CO_2 estimates for 2011 to 2013 with inventory data

The overview provided in Table 3-1 shows the closeness of the results of the early CO_2 emission estimates based on Eurostat monthly energy data with final GHG inventory data (CRF table 1.A.(b)) submitted to the UNFCCC for the same reference year. The comparison is based on trend changes calculated for CO_2 emissions from fossil fuel combustion. A comparison of calculated CO_2 emissions in kt is not conclusive due to data revisions and recalculations. The presentation of results is therefore based on the trend changes between years and not on absolute CO_2 emissions in kt.

The verification of the early CO_2 estimates with final GHG inventory data shows a continous improvement of the early CO_2 estimates over the years. The number of Member States (MS) that show very good results and deviations between the trend changes of early CO_2 estimates and final GHG inventory data below +/-2 % increases from 10 Member States in 2011 to 19 Member States in 2013. Thus more and more Member States provide good monthly data to Eurostat that are used for calculating early CO_2 estimates.

Table 3-1: Closeness of early CO_2 emission estimates with final GHG inventory CO_2 emissions (CRF table 1A(b))

	2011	2012	2013
Number of MS with a difference to final inventory of ≤ ±2%	10 MS	15 MS	19 MS
Contribution of those MS' to total EU-27/28 emissions	61%	44%	62%
Number of MS with a difference to final inventory of ± >2 and ≤ 5%,	5 MS	9 MS	6 MS
Contribution of those MS' to total EU-27/28 emissions	15%	50%	36%
Number of MS with a difference to final inventory of > ± 5%	12 MS	3 MS	3 MS
Contribution of those MS' to total EU-27/28 emissions	23%	6%	2%
Closeness at EU27/28 level[7]	**2.6%**	**-0.5%**	**-0.4%**

Source: Authors' own compilation based on Eurostat early CO_2 estimates and MS' GHG inventory submissions to UNFCCC

The results in the previous project for the years 2009-2011 were calculated with two different methods and by applying several gap filling procedures. The results for 2011 as shown in Table 3-1 and Table 3-2 are based on the simple trend change method as also applied for the years of 2012-2014 and do not contain any corrections of the original monthly energy data as provided by Member States. For the calculation of the 2012 and 2013 CO_2 emissions, some corrections were applied to the Eurostat monthly energy data in order to produce more reliable early CO_2 estimates. Such corrections mainly occured where submitted data was incomplete.

Table 3-1 and Table 3-2 show that in 2011 the closeness of the early CO_2 emission estimates to the final inventory CO_2 emissions is low, in particular for the new Member States. For EU-27, the early CO_2 emission estimates were 2.6% higher than the final CO_2 emissions; for EU-15 the early CO_2 estimates were 1.9% higher; and for EU-12 the early estimates were 5.4 % higher. In 2013 the differences at EU-28 were the lowest for the whole time series, making up only -0.4 %.

Table 3-2 indicates that the closeness of the early CO_2 estimates to the final GHG inventory data on CO_2 emissions from fossil fuel combustion for EU aggregates was quite good for the years

[7] Until 2012 the European Union had 27 Member States. On 1 July 2013 Croatia joined the EU as its 28th Member State.

2012 and 2013. The contribution of the Member States with differences lower than 2 % of the total EU-28 increased again to 62 % of total EU-28 emissions in 2013, as the differences for countries with high emissions like France and Poland were below 2 %. Additionally, the differences greater than 5 % represented only 2 % of the total EU-28 emissions in 2013, as - except Portugal - Estonia and Slovenia are rather small countries with low CO_2 emissions. It should be noted that in particular Member States with large differences between early CO_2 estimates and final GHG inventory CO_2 emission data change almost every year. This indicates that the quality of the reporting of monthly energy data is not consistent over the years.

Table 3-2: Comparison of early CO_2 emission estimates with final GHG inventory CO_2 emissions (CRF table 1A(b)) for 2011, 2012 and 2013 – Changes in CO_2 emissions from fossil fuel combustion

Member States	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF
Total	Change 2011/2010		%	Change 2012/2011		%	Change 2013/2012		%
Belgium	6.3%	-10.5%	**16.8%**	-11.8%	-6.3%	**-5.5%**	-0.3%	3.8%	-4.1%
Bulgaria	16.6%	11.5%	**5.1%**	-6.9%	-9.0%	2.2%	-10.2%	-12.1%	1.9%
Czech Republic	1.2%	-1.5%	2.7%	-5.2%	-5.5%	0.3%	-2.9%	-2.4%	-0.5%
Denmark	-13.3%	-11.3%	-2.0%	-9.4%	-10.7%	1.3%	6.8%	5.3%	1.5%
Germany	-3.1%	-3.2%	0.1%	0.9%	2.9%	-2.0%	2.0%	4.0%	-2.0%
Estonia	3.9%	2.2%	1.7%	-0.5%	-6.3%	**5.8%**	4.4%	13.3%	**-8.9%**
Ireland	9.0%	-8.0%	**17.0%**	-1.3%	-3.2%	1.9%	-3.8%	-4.0%	0.3%
Greece	0.6%	0.3%	0.3%	-0.2%	-5.2%	**5.0%**	-10.2%	-12.4%	2.2%
Spain	1.6%	1.1%	0.4%	-1.4%	-1.7%	0.3%	-12.6%	-10.4%	-2.2%
France	-2.5%	-7.2%	4.6%	-0.8%	1.5%	-2.3%	0.6%	-0.9%	1.5%
Croatia	-	-	-	-	-	-	-1.7%	-1.1%	-0.6%
Italy	-1.6%	-2.6%	1.0%	-5.1%	-5.2%	0.1%	-6.6%	-7.6%	1.0%
Cyprus	-4.4%	-3.4%	-1.0%	-8.5%	-6.0%	-2.4%	-14.7%	-14.1%	-0.6%
Latvia	-1.8%	-8.6%	**6.7%**	-2.8%	-4.5%	1.7%	-4.2%	-2.4%	-1.8%
Lithuania	-0.2%	-7.7%	**7.5%**	1.7%	0.3%	1.4%	-5.8%	-4.7%	-1.0%
Luxembourg	-8.9%	-1.0%	**-7.9%**	-1.7%	-2.0%	0.3%	-3.7%	-5.3%	1.5%
Hungary	4.8%	-2.8%	**7.6%**	-3.8%	-7.2%	3.4%	-6.9%	-6.5%	-0.3%
Malta	-7.4%	0.0%	**-7.4%**	6.3%	5.6%	0.7%	-6.8%	-10.4%	3.6%
Netherlands	0.0%	-7.1%	**7.2%**	-3.5%	-0.2%	-3.3%	-0.3%	-0.5%	0.3%
Austria	-3.8%	-4.6%	0.9%	-4.6%	-4.3%	-0.4%	-2.1%	-1.1%	-1.0%
Poland	7.8%	0.4%	**7.4%**	-5.0%	-7.4%	2.4%	0.3%	1.6%	-1.3%
Portugal	9.6%	-1.1%	**10.7%**	-4.0%	-1.5%	-2.5%	3.6%	-4.4%	**8.0%**
Romania	9.0%	9.3%	-0.3%	-4.5%	-3.3%	-1.2%	-14.6%	-12.7%	-1.9%
Slovenia	-1.7%	1.2%	-2.9%	-2.5%	-3.2%	0.7%	-12.0%	-4.0%	**-8.0%**
Slovakia	7.5%	-5.0%	**12.5%**	-6.5%	-7.4%	0.9%	-6.2%	-1.6%	-4.6%
Finland	-10.1%	-10.1%	0.0%	-11.8%	-16.4%	4.6%	-2.8%	-2.0%	-0.8%
Sweden	-7.8%	-4.2%	-3.6%	-10.1%	-9.6%	-0.5%	-4.2%	-6.2%	2.0%
United Kingdom	-9.0%	-7.6%	-1.4%	3.9%	4.6%	-0.7%	-2.4%	-3.2%	0.8%
EU 15	-2.8%	-4.7%	**1.9%**	-1.4%	-0.4%	**-1.0%**	-2.2%	-2.0%	**-0.2%**
EU 13	6.5%	1.1%	**5.4%**	-4.8%	-6.4%	**1.6%**	-3.9%	-2.4%	**-1.5%**
EU 28	-1.0%	-3.6%	**2.6%**	-2.1%	-1.6%	**-0.5%**	-2.5%	-2.1%	**-0.4%**

Note: Green: difference ≤ ± 2%, Yellow: difference ± >2 and ≤ 5%, Red: difference > ± 5% .
For calculating 2011 no corrections have been applied to the Eurostat monthly energy data used here.
For calculating 2012 solid fuel consumption for Belgium for the year 2011 has been corrected and for Malta data on international bunkers for Jet kerosene has been corrected for 2012 monthly data.
For calculating 2013 revised monthly data 2012 has been used as available in April 2014. Additionally for Estonia annual data was used for 2013. For France, Netherlands and Austria trend changes for solid fuels have been corrected by using annual data for 2013. For Finland and Hungary trend changes for solid fuels has been calculated in TJ.

Source: Eurostat early CO_2 estimates, MS GHG inventory submissions to UNFCCC

A detailed comparison on the level of trend changes calculated for aggregated fuel categories liquid, solid and gaseous can be found in the Annex.

3.2. Analysis of large differences at Member States level

This section provides additional explanations for the differences between early CO_2 emission estimates and Member State GHG inventory data for CO_2 emissions for the years 2012 and 2013 for those Member States for which the comparison with GHG inventory CO_2 emission data showed differences exceeding ± 4%.

Differences due to methodological changes (changing emission factors, fraction of carbon stored etc.) or revision of GHG inventory data on liquid, solid and natural gas consumption cannot be foreseen and are not related to the quality of Eurostat monthly energy data, but can result in large uncertainties. However, by comparing only the trend change of calculated CO_2 emissions compared to the previous year, most uncertainties due to methodological changes do not affect the trend change[8]. Whereas differences due to insufficient reporting of Eurostat monthly energy data has an impact on the closeness of results of the early CO_2 estimates.

Table 3-3 and Table 3-4 provide an explanation for Member States for which differences between early CO_2 estimates and GHG inventory CO_2 emission data exceed ± 4 %. Table 5-4 in the Annex includes data on apparent fuel consumption for liquid, solid and gaseous fuels from different data sources.

Table 3-3: Analysis of differences that lead to differences of above +/-4 % between early CO_2 estimates and GHG inventory CO_2 emissions for the year 2012

Member State	Explanation
Belgium	Differences are due to inconsistencies in the reporting of Eurostat monthly energy data in liquid fuels, solid fuels, gaseous fuels for the years 2011 and 2012.
Estonia	Differences are due to reporting of solid fuel consumption in 2012, where the monthly reporting of stock changes from oil shale leads to rather high differences. Reporting of liquid fuels also shows high differences, but the share of CO_2 emissions from liquid fuels is rather low.
Greece	Differences are due to reporting of liquid and solid fuels in 2011. In 2012 the reporting improved, but estimates are affected by the quality of the 2011 monthly data due to the trend change method.
Finland	The fluctuation in the reporting of liquid and solid fuel consumption (differences in 2011 between monthly liquid fuel consumption and inventory -2 %, in 2012 +4 %) affects the trend change and leads to differences in the CO_2 estimates and GHG inventory emission data.

Source: Authors' own comparison

[8] The trend changes calculated for GHG inventory CO_2 emission data are based on the same submission (e.g. trend change 2012/2011 from inventory submission 2014).

Table 3-4: Analysis of differences that lead to differences of above +/-4 % between early CO_2 estimates and GHG inventory CO_2 emissions for the year 2013

Member State	Explanation
Belgium	Data quality in 2012 for liquid fuels and data quality of solid fuels in 2012 and 2013. Data for natural gas consumption has been corrected by using revised monthly data for 2012.
Estonia	Differences are due to the reporting of solid fuels in 2012. Differences in the reporting of solid fuel consumption decreased considerably in 2013, but estimates are affected by the quality of the 2012 monthly data due to the trend change method.
Portugal	Differences are due to the reporting of liquid fuels in 2013. Besides the monthly reporting of international bunkers (That are consistently underreported) the reporting of gasoline leads to the differences in the results.
Slovenia	Differences are due to the reporting of liquid fuels and solid fuels in 2013 and the reporting of natural gas in 2012. While the reporting of natural gas improved considerably in 2013 the reporting of liquid and solid fuels deteriorated in 2013.
Slovakia	Differences are due to improvements in the reporting of natural gas. In the years 2011 and 2012 natural gas consumption reported under Eurostat monthly energy data was >20 % higher than natural gas consumption reported in the GHG inventories. In 2013 the difference decreased to 1 % and this affects the trend change that is used to calculate CO_2 emissions.

Source: Authors' own comparison

3.3. Calculation of early CO_2 estimates for the year 2014

This chapter presents an example of the calculation of early CO_2 emission estimates for the year 2014.

The following steps were taken to calculate early CO_2 emissions for 2014:

1. Calculation of trend changes of the fuel consumption for the aggregated fuel categories (liquid, solid, peat and natural gas) from Eurostat monthly energy data 2013 and 2014;
2. Calculation of CO_2 emissions for the four fuel categories by multiplying the trend changes with the CO_2 emissions of the GHG inventory data of the Reference Approach (CRF table 1.A(b) for the year 2013 (as available in May 2015[9]).

Table 3-5 and Table 3-6 show the calculation of the early CO_2 emissions according to the different steps.

[9] Due to delays in the UNFCCC reporting software, after adaptation to the 2006 IPCC Guidelines no Member States inventories were published on 15th April under the UNFCCC. Preliminary estimates of CO_2 emissions from fossil fuels have been provided by Member States for the year 2014.

Table 3-5: Calculation of trend changes for the aggregated fuel categories, 2014/2013

Member States	Monthly Eurostat data for liquid fuel consumption		Trend change liquids	Monthly Eurostat data for solid fuels without peat consumption		Trend change solids w.o.peat	Monthly Eurostat data for peat consumption		Trend change peat	Monthly Eurostat data for natural gas consumption		Trend change natural gas
	2013	2014	2014/2013	2013	2014	2014/2013	2013	2014	2014/2013	2013	2014	2014/2013
	kt		%	kt		%	kt		%	TJ NCV		%
Belgium	21,984	22,469	102%	3,994	4,678	117%	NO	NO	-	594,578	520,738	88%
Bulgaria	3,509	3,680	105%	30,409	33,281	109%	NO	NO	-	96,513	95,599	99%
Czech Republic	7,996	8,490	106%	46,801	45,718	98%	NO	NO	-	289,558	258,585	89%
Denmark	6,303	6,152	98%	5,485	4,447	81%	NO	NO	-	139,353	116,431	84%
Germany	98,991	97,508	99%	237,599	233,670	98%	NO	NO	-	3,075,491	2,738,165	89%
Estonia	310	269	87%	20,246	20,336	100%	403	220	55%	23,233	18,236	78%
Ireland	5,792	5,733	99%	2,080	2,031	98%	3,941	4,239	108%	168,227	162,531	97%
Greece	11,180	10,993	98%	53,193	49,200	92%	NO	NO	-	135,392	103,783	77%
Spain	46,235	45,406	98%	20,420	21,961	108%	NO	NO	-	1,092,011	990,950	91%
France	72,138	71,208	99%	20,052	14,774	74%	NO	NO	-	1,570,531	1,364,721	87%
Croatia	3,083	2,903	94%	1,146	1,099	96%	NO	NO	-	87,207	79,616	91%
Italy	53,495	51,314	96%	21,783	20,975	96%	NO	NO	-	2,402,257	2,122,967	88%
Cyprus	1,800	1,864	104%	NO	NO	NO	NO	NO	-	NO	NO	-
Latvia	1,105	1,197	108%	129	97	75%	3	3	100%	50,200	45,274	90%
Lithuania	2,193	2,384	109%	447	387	87%	66	41	62%	90,554	86,157	95%
Luxembourg	2,365	2,209	93%	76	78	103%	NO	NO	-	37,259	35,302	95%
Hungary	5,784	6,044	104%	10,796	10,359	96%	NO	NO	-	320,365	292,156	91%
Malta	712	730	103%	NO	NO	NO	NO	NO	-	NO	NO	-
Netherlands	27,926	26,657	95%	12,890	13,183	102%	NO	NO	-	1,394,339	1,217,665	87%
Austria"	11,344	11,149	98%	4,449	4,455	100%	NE	108	-	290,772	267,122	92%
Poland	21,781	21,375	98%	137,563	129,964	94%	NO	NO	-	574,372	562,338	98%
Portugal	10,569	9,725	92%	4,450	4,519	102%	NO	NO	-	162,206	149,900	92%
Romania	8,095	8,227	102%	25,754	25,840	100%	NO	NO	-	430,846	404,690	94%
Slovenia	2,163	2,188	101%	4,045	3,163	78%	NO	NO	-	28,954	26,241	91%
Slovakia	3,042	2,919	96%	6,657	6,522	98%	NO	NO	-	203,223	133,253	66%
Finland	7,196	8,196	114%	6,023	4,955	82%	5,314	5,800	109%	118,526	104,086	88%
Sweden	11,559	11,471	99%	2,613	2,927	112%	639	471	74%	40,068	33,245	83%
United Kingdom"	55,507	55,470	100%	61,027	48,781	80%	NO	NO	-	2,747,482	2,511,757	91%
EU 15	442,584	435,660	98%	456,133	430,634	94%	9,894	10,618	107%	13,968,491	12,439,362	89%
EU 13	61,573	62,270	101%	283,993	276,766	97%	472	264	56%	2,195,025	2,002,145	91%
EU 28	504,157	497,930	99%	740,126	707,400	96%	10,366	10,882	105%	16,163,517	14,441,507	89%

Note: " International bunkers for jet kerosene have been gap filled in 2013 Eurostat monthly energy data; NO is used if there is no consumption;Data on solid fuel consumption for Ireland has been corrected as reported data is confidential.

Source: Extraction from Eurostat database in the specific year

Table 3-6: Calculation of early CO_2 emissions for the year 2014

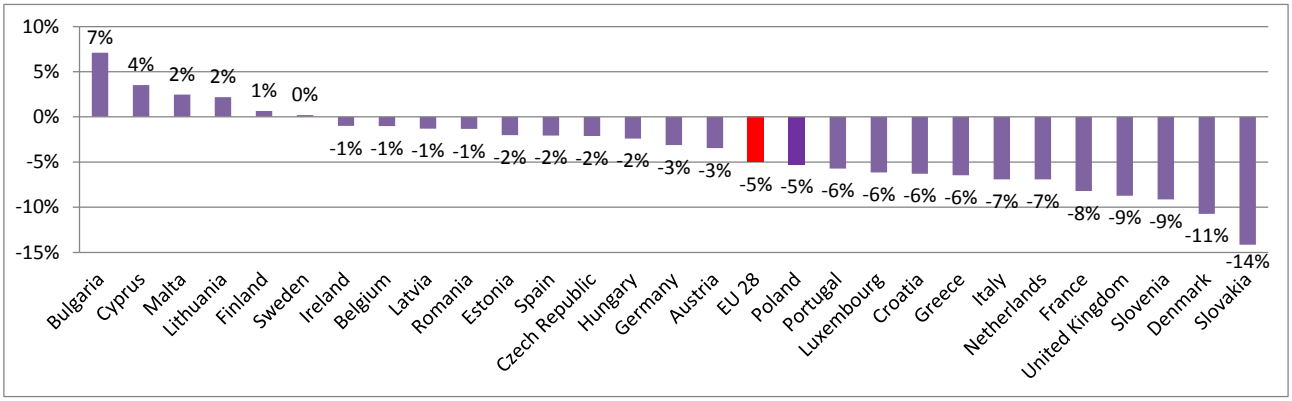
Member States	GHG Inventory data CO2 emissions from liquid fuels (provisional, inofficial submission 2015)	Trend change liquids without biofuels	CO2 emissions liquid fuels calculated with monthly Eurostat data	GHG Inventory data CO2 emissions from solid fuels without peat (provisional, inofficial submission 2015)	Trend change solids without peat	CO2 emissions solid fuels calculated with monthly Eurostat data	GHG Inventory data CO2 emissions from peat (provisional, inofficial submission 2015)	Trend change peat	CO2 emissions of peat consumption calculated with monthly Eurostat data	GHG Inventory data CO2 emissions from natural gas (provisional, inofficial submission 2015)	Trend change natural gas	CO_2 emissions natural gas calculated with monthly Eurostat data	**CO_2 emissions without waste and other fossils**
	2013	2014/2013	2014	2013	2014/2013	2014	2013	2014/2013	2014	2013	2014/2013	2014	**2014**
	kt CO_2	%	kt CO_2	kt CO_2	%	kt CO_2	kt CO_2	%	kt CO_2	kt CO_2	%	kt CO_2	**kt CO_2**
Belgium	45,254	102%	46,253	12,502	117%	14,643	NO	-	NO	32,751	88%	28,684	**89,580**
Bulgaria	10,141	105%	10,635	25,846	109%	28,287	NO	-	NO	4,733	99%	4,688	**43,610**
Czech Republic	18,019	106%	19,132	58,921	98%	57,557	NO	-	NO	16,117	89%	14,393	**91,083**
Denmark	17,755	98%	17,330	12,527	81%	10,156	NO	-	NO	7,884	84%	6,587	**34,073**
Germany*	255,163	99%	251,340	340,252	100%	339,060	NO	-	NO	172,994	89%	154,019	**744,419**
Estonia	1,083	87%	940	17,314	100%	17,391	272	55%	148	965	78%	758	**19,237**
Ireland	17,153	99%	16,978	5,254	98%	5,130	3,436	108%	3,695	9,245	97%	8,932	**34,736**
Greece	32,693	98%	32,147	36,332	92%	33,605	NO	-	NO	6,983	77%	5,353	**71,104**
Spain	126,496	98%	124,228	42,052	108%	45,225	NO	-	NO	61,118	91%	55,462	**224,915**
France	197,289	99%	194,746	50,880	74%	37,489	NO	-	NO	89,618	87%	77,874	**310,109**
Croatia	9,131	94%	8,598	2,684	96%	2,574	NO	-	NO	4,190	91%	3,825	**14,996**
Italy	163,154	96%	156,502	54,641	96%	52,615	NO	-	NO	135,848	88%	120,054	**329,171**
Cyprus	5,202	104%	5,387	-	-	NO	NO	-	NO				**5,387**
Latvia	3,086	108%	3,343	270	75%	203	9	100%	9	2,742	90%	2,473	**6,028**
Lithuania	6,572	109%	7,145	913	87%	790	177	62%	110	3,076	95%	2,926	**10,971**
Luxembourg	7,314	93%	6,832	156	103%	160	NO	-	NO	2,112	95%	2,001	**8,992**
Hungary*	12,751	104%	13,324	9,372	100%	9,361	NO	-	NO	17,050	91%	15,549	**38,233**
Malta	2,418	103%	2,479	NO	-	NO	NO	-	NO	1			**2,479**
Netherlands	41,879	95%	39,976	36,019	102%	36,838	NO	-	NO	74,525	87%	65,082	**141,896**
Austria"	31,192	98%	30,656	5,078	100%	5,085	0.47	-	0.47	15,495	92%	14,235	**49,976**
Poland*	55,696	98%	54,658	215,725	93%	201,366	2,489	-	2,489	27,683	98%	27,103	**285,616**
Portugal	25,565	92%	23,524	10,297	102%	10,457	NO	-	NO	8,808	92%	8,140	**42,121**
Romania	21,556	102%	21,908	21,159	100%	21,230	35	-	35	20,994	94%	19,720	**62,893**
Slovenia	6,931	101%	7,011	5,606	78%	4,384	NO	-	NO	1,592	91%	1,443	**12,837**
Slovakia	8,045	96%	7,719	9,715	98%	9,518	NO	-	NO	9,804	66%	6,428	**23,666**
Finland	20,275	114%	23,092	13,179	82%	10,842	6,011	109%	6,561	5,972	88%	5,244	**45,739**
Sweden	30,311	99%	30,081	7,759	112%	8,691	1,037	74%	764	2,048	83%	1,700	**41,236**
United Kingdom"	158,486	100%	158,381	123,082	80%	98,384	47	-	47	154,973	91%	141,677	**398,489**
EU 15	**1,169,981**	98%	**1,152,064**	**750,010**	94%	**708,379**	**10,531**	107%	**11,068**	**780,375**	89%	**695,044**	**2,566,555**
EU 13	**160,632**	101%	**162,280**	**367,527**	97%	**352,661**	**2,982**	56%	**2,792**	**108,947**	91%	**99,305**	**617,038**
EU 28	**1,330,613**	99%	**1,314,344**	**1,117,537**	96%	**1,061,040**	**13,513**	105%	**13,859**	**889,322**	89%	**794,350**	**3,183,593**

Note: * Trend changes of solid fuels were calculated in TJ; " International bunkers for jet kerosene have been gap filled in 2013 Eurostat monthly energy data; NO is used if there is no consumption.

Source: Eurostat database and Member States' inventory submissions UNFCCC 2014

Table 3-6 shows the results for early CO_2 estimates for the year 2014 based on the method described in section 2.1. These early estimates suggest that the CO_2 emissions from fuel combustion decreased for 22 Member States and increased for only 6 Member States in 2014 (see Figure 3-1). The calculations do not include CO_2 emissions from the new categories waste fuels and other fossil fuels, as there are no Eurostat monthly energy data available that could indicate the trend changes.

Figure 3-1: Relative changes in total fossil fuel consumption for all Member States for 2014/2013



Source: Eurostat early estimates

The early estimates indicate that CO_2 emissions from the energy sector decreased by 5.0 % for the EU-28 between 2013 and 2014.

3.4. Quality of monthly Eurostat fuel consumption data

This chapter presents the analysis of the quality level of monthly Eurostat energy data compared to annual Eurostat data and to energy data on fuel consumption used by Member States for the GHG inventory. Based on this comparison it will be determined whether the quality of these data improved compared to data reported for the years 2008-2012 and in which areas substantial deviations continue to occur.

3.4.1. Comparison of monthly Eurostat energy data with annual data

This section provides comparisons of the differences between annual and cumulated monthly fuel consumption data of liquid, solid and gaseous fuel types for the years 2008-2013. The datasets for the 28 Member States of the EU were provided by Eurostat in in the specific year and processed by Oeko-Institut.

3.4.1.1. Liquid fuels

In 2008, nine Member States showed differences of less than 2 % between Eurostat annual and cumulated monthly energy data on liquid fuel consumption. These nine Member States have a share of 43 % of the total EU-27 liquid fuel consumption. Differences greater than 5 % were identified for nine Member States (see Table 3-7). These nine Member States have a share of 24 % of EU-27 total liquid fuel consumption.

In 2013, differences between annual and monthly data of less than 2 % were found for fourteen Member States. Liquid fuel consumption of these fourteen Member States amounts to 58 % of total

EU-28 liquid fuel consumption. Six Member States were identified with differences of above 5 %. These six Member States have a share of 17 % in the total EU-28 liquid fuel consumption.

In most countries the consumption of liquid fuels constitutes a large share of the total CO_2 emissions from energy consumption. Cyprus and Malta use almost 100 % liquid fuels in their energy sector and in Luxembourg and Sweden the share of liquid fuels in total emissions from energy consumption is above 70 % (see Table 3-7). Thus a high data quality for liquid fuels is required to provide good CO_2 estimates.

Table 3-7: Difference between Eurostat monthly and annual liquid fuel data, 2008-2013

Member States	2008	2009	2010	2011	2012	2013	Share of emissions from liquid fuels in total energy CO2 emissions (%) in 2013
Belgium	-6%	-4%	-10%	-1%	6%	2%	48%
Bulgaria	7%	7%	-14%	-8%	-4%	1%	25%
Czech Republic	0%	0%	-4%	-2%	-1%	0%	19%
Denmark	-5%	-4%	21%	2%	5%	9%	45%
Germany	-1%	-1%	-1%	0%	-1%	-1%	33%
Estonia	64%	107%	117%	114%	63%	-26%	5%
Ireland	-6%	0%	5%	7%	-2%	-1%	49%
Greece	2%	3%	5%	1%	-4%	5%	42%
Spain	2%	2%	0%	0%	1%	0%	55%
France	3%	2%	2%	6%	6%	2%	58%
Croatia	NE	NE	NE	0%	0%	2%	57%
Italy	-3%	-1%	-2%	-3%	1%	0%	43%
Cyprus	-6%	0%	1%	1%	-2%	-1%	99%
Latvia	-4%	0%	-1%	4%	-9%	-12%	52%
Lithuania	4%	1%	2%	1%	-1%	1%	60%
Luxembourg	8%	8%	13%	-1%	-2%	1%	76%
Hungary	1%	-2%	-6%	2%	-1%	5%	32%
Malta	NE	-47%	1%	-28%	34%	-3%	100%
Netherlands	-1%	0%	2%	0%	-2%	-1%	32%
Austria	5%	8%	11%	12%	11%	5%	58%
Poland	-15%	-1%	-1%	1%	-2%	1%	19%
Portugal	5%	3%	5%	3%	6%	15%	56%
Romania	1%	-4%	-5%	2%	0%	1%	34%
Slovenia	-2%	-2%	1%	-1%	-2%	-10%	49%
Slovakia	0%	5%	1%	0%	-2%	-2%	29%
Finland	4%	2%	11%	-3%	2%	0%	44%
Sweden	-2%	0%	2%	-2%	-1%	1%	70%
United Kingdom	15%	25%	21%	18%	21%	19%	36%
EU 27 /28	**1%**	**3%**	**2%**	**3%**	**3%**	**3%**	39%
<+/- 2%	9 MS	13 MS	12 MS	13 MS	14 MS	14 MS	
+/-2-5%	8 MS	8 MS	4 MS	8 MS	6 MS	8 MS	
> +/- 5%	9 MS	6 MS	11 MS	7 MS	8 MS	6 MS	

Note: Percentages calculated by dividing original cumulated monthly Eurostat by annual Eurostat data. Data for Croatia is included from 2011 onwards.
NE is used for countries for which cumulated monthly data could not be estimated, as they were not available or are incomplete.
Annual Eurostat data = 100 %, a positive value indicates that monthly data is higher than annual data; a negative value indicates that monthly data is lower than annual data.

Source: Extraction from Eurostat database in the specific year

Table 3-7 shows that there is not an overall systematic quality increase over the years. While some Member States improved the consistency of Eurostat monthly and annual energy data over the 2008-2013 period (LU, BG, CY, CZ, EE, LT, RO), the consistency deteriorated in other Member States (DK, EL, HU, LV, PT, SI). Germany, the Netherlands and Spain are the only countries that provide good monthly data for liquid fuel consumption for all years. Nevertheless, the share of these three countries in the EU-28 total liquid fuel consumption amounts to 34 % in 2013. Some countries like Sweden, Cyprus and Lithuania show small differences of below 5 % for only one year in the time series, while all other countries show differences between annual and monthly liquid fuel consumption data in at least two years.

Systematic differences for the whole time series are found for Austria and the United Kingdom. This is due to the non-reporting of international bunkers in the Eurostat monthly data and does not strongly influence the trend changes that are used for calculating CO_2 emissions. Nevertheless, from 2014 onwards Austria and the United Kingdom improved the reporting of monthly data and provided monthly data on international aviation bunkers for the first time.

Large differences between annual and monthly liquid fuel consumption are found for Malta for many reporting years. The differences occur due the differences in the reporting of international bunkers in annual and Eurostat monthly energy data, and have improved considerably from 2013 onwards.

In the case of Denmark and Portugal the large differences between monthly and annual Eurostat data are also due to the inconsistent reporting of international bunkers in the monthly data. The reporting of international aviation bunkers is not mandatory under the Energy Statistics regulation for monthly data. Thus, many countries do not or only partly report international bunkers in their monthly data. For the calculation of the fuel consumption based on the IPCC reference approach the reporting of international bunkers is relevant.

The largest differences in all years are observed in the case of Estonia. These differences are due to the reporting of shale oil, which differs in the monthly reporting from the annual reporting. Nevertheless, this difference has decreased over the years and monthly reporting has improved. As the share of liquid fuels in total CO_2 emissions from energy consumption only amounts to 5 % of total CO2 emissions in Estonia in 2013, these large differences do not strongly influence the results of the early CO_2 estimates.

The differences of almost 3 % in all years at the EU level can be explained by the non-reporting of international bunkers from the United Kingdom. In 2013 the international bunkers from jet kerosene in the United Kingdom accounted for 10,418 kt, which is 2 % of the EU-28 total liquid fuel consumption.

3.4.1.2. Solid fuels

In 2008 twelve Member States showed differences of less than 2 % between annual and cumulated monthly solid fuel consumption. These twelve Member States have a share of 56 % of the total EU-27 solid fuel consumption. Differences greater than 5 % were identified for seven Member States (see Table 3-8). These seven Member States have a share of only 5 % of EU-27 total solid fuel consumption.

In 2013, differences between annual and monthly data of less than 2 % were found for fourteen Member States. Solid fuel consumption of these fourteen Member States accounts for 51 % of the total EU-28 solid fuel consumption. The number of Member States that have differences of more

than 5 % decreased to five Member States in 2013. These five Member States have a share of 5 % of the total EU-28 solid fuel consumption.

Table 3-8: Difference between Eurostat monthly and annual solid fuel data, 2008-2013

Member States	2008	2009	2010	2011	2012	2013	Share of emissions from solid fuels in total energy CO2 emissions (%) in 2013
Belgium	-6%	-20%	-75%	-42%	-12%	-20%	13%
Bulgaria	2%	0%	0%	0%	1%	-1%	63%
Czech Republic	0%	0%	-4%	1%	0%	1%	63%
Denmark	0%	1%	0%	0%	1%	2%	32%
Germany	-1%	-1%	-3%	-2%	-3%	-4%	43%
Estonia	2%	10%	0%	1%	7%	-1%	88%
Ireland	-20%	-17%	-45%	1%	7%	2%	25%
Greece	-3%	-5%	-14%	-6%	-2%	-3%	49%
Spain	-2%	10%	7%	3%	4%	-1%	18%
France	0%	-2%	4%	4%	8%	7%	15%
Croatia	NE	NE	NE	-1%	-1%	1%	17%
Italy	4%	-5%	-6%	1%	-2%	1%	16%
Cyprus	2%	-5%	-4%	-15%	NO	NO	-
Latvia	-1%	7%	1%	-1%	30%	1%	4%
Lithuania	0%	-3%	8%	-12%	-1%	0%	10%
Luxembourg	-13%	-12%	-14%	-2%	-2%	-5%	2%
Hungary	0%	-1%	1%	0%	0%	1%	24%
Malta	NO	NO	NO	NO	NO	NO	-
Netherlands	-2%	-1%	-1%	38%	22%	-1%	20%
Austria	-15%	-10%	-2%	-7%	-17%	-9%	9%
Poland	4%	2%	-3%	3%	1%	0%	71%
Portugal	1%	1%	-10%	0%	0%	0%	23%
Romania	-4%	-9%	1%	-2%	0%	-3%	33%
Slovenia	-7%	-4%	-1%	-2%	-2%	-10%	39%
Slovakia	6%	1%	-10%	2%	1%	-3%	35%
Finland	-9%	-4%	-3%	-3%	2%	-1%	42%
Sweden	-1%	-17%	9%	-3%	-14%	-11%	20%
United Kingdom	0%	1%	0%	1%	0%	0%	28%
EU 27 /28	**0%**	**-1%**	**-4%**	**0%**	**0%**	**-2%**	33%
<+/- 2%	12 MS	10 MS	10 MS	14 MS	11 MS	14 MS	
+/-2-5%	7 MS	6 MS	6 MS	7 MS	7 MS	7 MS	
> +/- 5%	7 MS	10 MS	10 MS	6 MS	8 MS	5 MS	

Note: Percentages calculated by dividing original cumulated monthly Eurostat by annual Eurostat data. Data for Croatia is included from 2011 onwards.
NE is used for countries for which cumulated monthly data could not be estimated, as they were not available or are incomplete.
NO is reported if there is no solid fuel consumption in the country. Cyprus did not report solid fuel consumption under monthly Eurostat data in 2012 and 2013.
Annual Eurostat data = 100 %, a positive value indicates that monthly data is higher than annual data; a negative value indicates that monthly data is lower than annual data.
For IE the data for solid fuels has been corrected from 2011 onwards, as the reporting is confidential.

Source: Extraction from Eurostat database in the specific year

Countries with emissions from solid fuel consumption of above 50% of their total CO_2 emissions from energy consumption in 2013 are Bulgaria, the Czech Republic, Estonia and Poland.

Similar to liquid fuel consumption, Table 3-8 shows that there is no systematic quality increase over the years for solid fuels. In comparison to liquid fuel consumption there are four countries (Bulgaria, Croatia, Hungary and the United Kingdom) that provide good monthly data for solid fuel consumption for all reported years. The share of these four countries in total solid fuel consumption of the EU accounts for 14% in 2013. Denmark, Portugal and the Czech Republic show larger differences for only one year in the time series, while all other countries have larger differences in at least two years. Croatia only started reporting in 2011 with EU accession and the data show very small differences.

Large differences in almost all years can be found for Ireland. Hard coal and peat consumption data for Ireland are incomplete in the Eurostat monthly database. This is due to confidentiality issues. For this reason for peat and hard coal consumption approximations were used based on reported deliveries to main activity producer power plants instead of the reported monthly hard coal and peat consumption data. This is done from 2011 onwards for all hard coal and peat consumption data for Ireland shown in this report and already reflected in Table 3-8.

Belgium consistently underreported monthly hard coal consumption, but improved the reporting of BKB and patent fuels and in coke oven/gas coke between Eurostat monthly and annual energy data in 2013.

Besides Belgium's differences above 10 % for solid fuel consumption in the reporting between monthly and annual Eurostat data, also for the year 2013 similar values can be found for Slovenia and Sweden. For these countries the differences are due to inconsistencies in the reporting of hard coal consumption.

Furthermore, tendencies of consistent underreporting of solid fuel consumption in monthly data are visible for some Member States (AT, DE); while for others it varies from under reporting to over reporting and vice versa. Some developments are very unfortunate – like the clear deterioration of data quality as is visible for Austria, France and Sweden for the last year. It is the responsibility of Member States to carefully analyse the reasons for the differences indicated between their monthly and annual data for solid fuels.

The difference for total solid fuel consumption on EU 28 level increased to -2% in 2013. This amounts to an absolute difference of -12,824 kt and is due to large differences in solid fuel consumption in France (1,228 kt), Greece (-1,495 kt) and Germany (-9,680 kt). The big difference of -4 % in 2010 amounts to an absolute difference of 25,009 kt between annual and Eurostat monthly energy data in the EU-28. This was due to large differences in solid fuel consumption in Greece (-8,211 kt), Germany (-7,789 kt), Poland (-4,224 kt) and other countries.

3.4.1.3. Gaseous fuels

In 2008 twelve Member States showed differences of below 2% between annual and cumulated monthly natural gas consumption. These twelve Member States share 56 % of the total EU-27 gaseous fuel consumption. Differences of above 5% were identified for four Member States (see Table 3-9). These four Member States have a share of only 5% of the total EU-27 natural gas consumption. Due to different concepts being used since the reference year 2012 for import and export data for the annual (import from country of ultimate origin) and the monthly (import from country of last consignment) data collections, the comparability of import and export data is no longer provided. As a consequence, a country which does not produce natural gas itself cannot report natural gas exports in annual data, while it has to report exports of natural gas in transit in monthly statistics.

In 2013, differences between annual and monthly data below 2 % were found for twenty Member States. These twenty Member States account for 84 % of the total EU-28 natural gas consumption. The number of Member States that have differences of above 5% decreased to two Member States in 2013. These two Member States have a share of 3% of the EU-28 total natural gas consumption.

Table 3-9: Difference between Eurostat monthly and annual natural gas data, 2008-2013

Member States	2008	2009	2010	2011	2012	2013	Share of emissions from natural gas in total energy CO2 emissions (%) in 2013
Belgium	-18%	-10%	-18%	-25%	-45%	-1%	35%
Bulgaria	0%	-3%	3%	-4%	-10%	-3%	12%
Czech Republic	0%	0%	-4%	0%	-2%	0%	17%
Denmark	-1%	0%	-1%	-3%	-5%	0%	20%
Germany	1%	0%	10%	1%	-4%	1%	22%
Estonia	-5%	-12%	-12%	-3%	0%	0%	5%
Ireland	-21%	0%	1%	3%	3%	4%	26%
Greece	0%	0%	0%	0%	0%	0%	9%
Spain	0%	0%	0%	0%	0%	0%	27%
France	-1%	-8%	-3%	1%	-5%	-4%	26%
Croatia	NE	NE	NE	-6%	-9%	-9%	26%
Italy	0%	0%	0%	0%	0%	0%	40%
Cyprus	NO	NO	NO	NO	NO	NO	-
Latvia	0%	0%	0%	0%	0%	0%	42%
Lithuania	0%	0%	0%	0%	0%	0%	28%
Luxembourg	-3%	0%	0%	0%	0%	0%	22%
Hungary	2%	-1%	-13%	-2%	3%	-1%	43%
Malta	NO	NO	NO	NO	NO	NO	-
Netherlands	4%	-1%	-1%	3%	0%	1%	47%
Austria	-3%	-1%	-5%	-5%	-1%	-1%	29%
Poland	3%	2%	0%	0%	0%	0%	9%
Portugal	0%	-1%	-26%	0%	2%	3%	20%
Romania	-3%	-2%	2%	3%	3%	5%	33%
Slovenia	-5%	-3%	-4%	-7%	-9%	0%	11%
Slovakia	-10%	21%	1%	22%	23%	1%	35%
Finland	3%	0%	-7%	0%	0%	-1%	13%
Sweden	0%	-9%	93%	0%	0%	0%	5%
United Kingdom	3%	-2%	-1%	0%	0%	0%	35%
EU 27 /28	**0%**	**-1%**	**0%**	**0%**	**-3%**	**0%**	26%
<+/- 2%	12 MS	17 MS	12 MS	14 MS	13 MS	20 MS	
+/-2-5%	9 MS	3 MS	6 MS	7 MS	7 MS	4 MS	
> +/- 5%	4 MS	5 MS	7 MS	5 MS	6 MS	2 MS	

Note: Percentages calculated by dividing original cumulated monthly Eurostat by annual Eurostat data.
Data for Croatia is included from 2011 onwards. NE is used for countries for which cumulated monthly data could not be estimated, as they were not available or are incomplete. NO is reported if there is no gaseous fuel consumption in the country
Annual Eurostat data = 100 %, a positive value indicates that monthly data is higher than annual data; a negative value indicates that monthly data is lower than annual data.

Source: Extraction from Eurostat database in the specific year

The reporting quality of data on natural gas was always good with an outlier in 2012.

There is no country within the EU-28 for which the share of emissions from natural gas in the total energy CO_2 emissions is above 50 %. In Greece, Sweden, Estonia and Poland the share is even below 10 %. In Malta and Cyprus natural gas is not consumed at all. Of the three fuel consumption categories (liquid, solid and natural gas) Eurostat monthly data on natural gas consumption is the most consistent with the annual data. Five countries (Spain, Greece, Italy, Lithuania and Latvia) provide good data quality with differences below 2 % for all reported years. These five Member States have a share of 25 % of the total EU-28 natural gas consumption. Luxembourg and the United Kingdom show differences above 2 % for only one year in the time series, while all other countries have larger differences in at least two years.

Large differences in almost all years can be found for Belgium and Slovakia in earlier years. Since 2013 Belgian authorities have changed their data collection system and a clear improvement is visible. Slovakia also improved its reporting in 2013 and provided good monthly data for natural gas consumption. While most other countries improved their reporting in 2013, the quality of monthly reporting of natural gas from Croatia is still inadequate. Croatia should investigate the origin of these differences. For Romania the differences in the reporting of natural gas between monthly and annual Eurostat data increased in 2013. Thus Romania should review its reporting of natural gas.

The difference for total natural gas consumption on EU level is below 2 % in all years, except in 2012. The difference of -3 % in 2012 amounts to an absolute difference of 427,617 TJ between annual and Eurostat monthly energy data in the EU-28. This is due to large differences in natural gas consumption in Belgium (-271,706 TJ) and Germany (-108,248 TJ).

3.4.2. Comparison of Eurostat annual energy data with GHG inventory data

This section provides comparisons of the annual Eurostat data with GHG inventory data from the reference approach table 1.A(b) from UNFCCC submissions for fuel consumption data of liquid, solid and gaseous fuel types for the years 2008-2013[10]. The comparison is based on physical units (kt) which are reported by Eurostat data and in the CRF table (1.A(b). As some Member States provide Table 1.A(b) only in TJ, GHG inventory data for these Member States was converted to physical units for the comparison with Eurostat annual fuel consumption data using net calorific values from Member States' national inventory reports.

The following sub-chapters summarize large differences between annual Eurostat and GHG inventory data for aggregate fuel categories liquid, solid and gaseous fuels. Table 5-5 in the Annex provides a comparison of GHG inventory data and annual Eurostat data for the three aggregate fuel categories for all Member States.

The comparison of energy data on fuel consumption reported as annual data to Eurostat and the energy data used in the GHG inventory table 1.A(b) reveals that many Member States use different data sources for the inventory and for reporting to Eurostat as annual data. The following sub-chapters provide an overview of the differences for the reporting of liquid, solid and gaseous fuel consumption. A detailed analysis based on individual fuels is not provided, as this is not relevant for the improvement of Eurostat monthly energy data and the calculation of the early CO_2 estimates.

[10] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php

3.4.2.1. Liquid fuels

In 2008, sixteen Member States showed differences of less than 2 % between annual Eurostat data and GHG inventory data for liquid fuel consumption. These sixteen Member States were responsible for 46 % of total EU-27 liquid fuel consumption. Differences greater than 5 % could be identified for four Member States (see Table 3-10). These four Member States accounted for only 4 % of EU-27 total liquid fuel consumption.

In 2013, the number of Member States with differences between annual and GHG inventory data of less than 2 % remained at fourteen. Liquid fuel consumption of these fourteen Member States accounts for 56 % of the total EU-28 liquid fuel consumption. The number of Member States that have larger differences of above 5 % decreased to five Member States in 2013, making up a share of 5 % of the EU-28 total liquid fuel consumption.

In comparison to 2012 the differences between annual Eurostat and annual GHG inventory data worsened for four Member States from below 2% to more than 2% (Belgium, Hungary, the Netherlands and Slovenia), while for three Member States it worsened from a difference between more than 2 but below 5% to a difference bigger than 5% (Latvia, Finland, Sweden).

So far, there has not been a systematic improvement of the consistency between annual Eurostat energy data on liquid fuel consumption and the liquid fuel consumption data reported in the GHG inventory table 1.A(b) across all Member States.

Table 3-10: Difference in liquid fuel consumption between GHG inventory data (table 1.A(b) and annual Eurostat data, 2008-2013

Member States	2008	2009	2010	2011	2012	2013	Share of emissions from liquid fuels in total energy CO2 emissions (%) in 2013
Belgium	-1%	1%	2%	-1%	0%	-2%	48%
Bulgaria	1%	0%	-1%	0%	1%	0%	25%
Czech Republic	2%	1%	1%	3%	0%	1%	19%
Denmark	1%	6%	-13%	-3%	2%	0%	45%
Germany	3%	3%	1%	0%	-1%	-1%	33%
Estonia	452%	5%	-6%	-1%	8%	2%	5%
Ireland	-9%	-18%	2%	-2%	7%	3%	49%
Greece	0%	-4%	-2%	-7%	7%	0%	42%
Spain	0%	0%	2%	2%	1%	2%	55%
France	-3%	2%	-4%	-4%	-5%	-3%	58%
Croatia	NE	NE	NE	-3%	0%	-2%	57%
Italy	-5%	-7%	-5%	-4%	-5%	-4%	43%
Cyprus	7%	5%	1%	0%	2%	0%	99%
Latvia	0%	0%	-3%	1%	3%	5%	52%
Lithuania	-1%	-5%	-8%	-8%	-7%	-8%	60%
Luxembourg	-2%	-2%	0%	1%	4%	3%	76%
Hungary	-1%	1%	-1%	-6%	-1%	-3%	32%
Malta	NE	-7%	3%	34%	-11%	-5%	100%
Netherlands	2%	3%	1%	3%	-1%	-2%	32%
Austria	-1%	-1%	-4%	-1%	0%	0%	58%
Poland	-2%	-1%	-2%	0%	0%	0%	19%
Portugal	-2%	-2%	1%	3%	-3%	-1%	56%
Romania	-15%	-9%	8%	3%	-1%	-2%	34%
Slovenia	4%	-1%	1%	2%	1%	3%	49%
Slovakia	-2%	-1%	-1%	-1%	-2%	-3%	29%
Finland	4%	4%	-5%	2%	2%	-6%	44%
Sweden	1%	-7%	3%	6%	4%	-6%	70%
United Kingdom	0%	1%	0%	-1%	-2%	-1%	36%
EU 27 /28	**1%**	**0%**	**1%**	**1%**	**-1%**	**-2%**	39%
<+/- 2%	16 MS	14 MS	14 MS	13 MS	14 MS	14 MS	
+/-2-5%	6 MS	5 MS	8 MS	10 MS	7 MS	9 MS	
> +/- 5%	4 MS	8 MS	5 MS	5 MS	7 MS	5 MS	

Note: Data for Croatia is included from 2011 onwards.
NE is used for countries for which data could not be estimated, as they were not available or are incomplete.
GHG inventory data = 100 %, a positive value indicates that annual Eurostat data is higher than GHG inventory data, a negative value indicates that annual Eurostat data is lower than GHG inventory data.

Source: Extraction from Eurostat database and GHG inventory submission to UNFCCC in the specific year

3.4.2.2. Solid fuels

In 2008 fifteen Member States showed differences of less than 2 % between annual Eurostat data and GHG inventory data for solid fuel consumption. These fifteen Member States were responsible for 77 % of total EU-27 solid fuel consumption.

Differences above 5 % could be identified for eight Member States (see Table 3-11), which account for 17 % of the EU-27 total solid fuel consumption.

In 2013, data differences between annual Eurostat data and GHG inventory data of less than 2 % could be found for 21 Member States. These 21 Member States account for 94 % of the total EU-28 solid fuel consumption. One Member State shows differences bigger than 5 %. This Member State consumes 3 % of EU-28 total solid fuels.

Compared to 2008 the reporting of solid fuels improved in many countries. Thus, in terms of the number of Member States with lower differences between annual Eurostat data and GHG inventory data the situation improved. However, in a few Member States we see a deterioration of the situation from good to less good (the Netherlands and Denmark).

The situation of solid fuel consumption in Cyprus is a specific one: from 2008 to 2010 small volumes of bituminous coal were imported (max. 41 kt per year). In addition 1 kt of lignite import has been reported every year since 2008. From 2012 onwards only 1 kt of lignite is reported under annual Eurostat data and GHG inventory data. These are amounts which can be neglected.

Table 3-11: Difference in solid fuel consumption between GHG inventory (Table 1.A(b) and annual Eurostat data, 2008-2013

Member States	2008	2009	2010	2011	2012	2013	Share of emissions from solid fuels in total energy CO2 emissions (%) in 2013
Belgium	0%	-3%	-1%	0%	1%	1%	13%
Bulgaria	1%	6%	0%	0%	0%	0%	63%
Czech Republic	1%	1%	1%	-1%	-3%	-2%	63%
Denmark	0%	0%	1%	1%	0%	-2%	32%
Germany	0%	0%	-1%	0%	0%	0%	43%
Estonia	0%	1%	0%	0%	0%	0%	88%
Ireland	10%	0%	-1%	0%	7%	-3%	25%
Greece	0%	0%	1%	0%	0%	0%	49%
Spain	0%	0%	0%	0%	0%	0%	18%
France	-11%	-4%	-9%	-10%	-11%	-12%	15%
Croatia	NE	NE	NE	0%	0%	0%	17%
Italy	2%	1%	1%	1%	2%	2%	16%
Cyprus	-1%	4%	4%	8%	NO	NO	-
Latvia	0%	2%	6%	8%	0%	0%	4%
Lithuania	10%	9%	8%	2%	4%	4%	10%
Luxembourg	18%	0%	0%	0%	0%	-1%	2%
Hungary	-10%	-5%	-8%	-6%	0%	0%	24%
Malta	NO	NO	NO	NO	NO	NO	-
Netherlands	-1%	-1%	-1%	-1%	-5%	-4%	20%
Austria	3%	0%	0%	0%	0%	1%	9%
Poland	-1%	-1%	3%	-1%	-1%	0%	71%
Portugal	0%	0%	0%	2%	1%	1%	23%
Romania	8%	10%	0%	0%	0%	0%	33%
Slovenia	0%	0%	0%	0%	0%	0%	39%
Slovakia	-1%	-1%	4%	-1%	-1%	0%	35%
Finland	-5%	-2%	0%	-1%	1%	-2%	42%
Sweden	13%	6%	5%	10%	-4%	0%	20%
United Kingdom	5%	14%	-1%	-1%	-1%	-1%	28%
EU 27 /28	**0%**	**1%**	**0%**	**-1%**	**-1%**	**-1%**	33%
<+/- 2%	15 MS	16 MS	18 MS	22 MS	20 MS	21 MS	
+/-2-5%	3 MS	5 MS	4 MS	0 MS	3 MS	4 MS	
> +/- 5%	8 MS	5 MS	4 MS	5 MS	3 MS	1 MS	

Note: Data for Croatia is included from 2011 onwards.
NE is used for countries for which data could not be estimated, as they were not available or are incomplete.
NO is reported if there is no solid fuel consumption in the country.
GHG inventory data = 100 %, a positive value indicates that annual Eurostat data is higher than GHG inventory data, a negative value indicates that annual Eurostat data is lower than GHG inventory data.
Luxembourg reported municipal solid waste under the GHG inventory table 1.A(b) in 2008 and 2009. This amount is not taken into account here. Denmark reports municipal solid waste under solid fossils under GHG inventory table 1.A(b) for the whole time series. This amount is not taken into account here.

Source: Extraction from Eurostat database and GHG inventory submission to UNFCCC in the specific year

3.4.2.3. Gaseous fuels

In 2008 twenty-two Member States showed differences of less than 2 % between annual Eurostat and GHG inventory data for natural gas consumption. These twenty-two Member States are responsible for 82 % of EU-27 total natural gas consumption. Differences greater than 5% were identified for Estonia (see Table 3-12), which consumes only 0.2 % of EU-27 total natural gas.

In 2013, differences between annual Eurostat and GHG inventory data of less than 2% were found for 25 Member States. The natural gas consumption of these 25 Member States accounts for 81 % of total EU-28 natural gas consumption. Germany's natural gas consumption amounts to the remaining 19 % of the EU 28 and shows a difference of above 2 % between annual Eurostat and GHG inventory data. For 2013 no Member State shows differences of above 5% between annual Eurostat data and GHG inventory data.

In the year 2013 all Member States except Germany, Estonia and the Netherlands seem to use the same data sources for the reporting of natural gas consumption for inventory compilation and reporting to Eurostat.

Hence, the consistency between annual Eurostat data and the energy data reported in the GHG inventory table 1.A(b) improved in the case of natural gas.

Table 3-12: Difference between natural gas consumption in GHG inventory (table 1.A(b) and annual Eurostat data, 2008-2013

Member States	2008	2009	2010	2011	2012	2013	Share of emissions from natural gas in total energy CO2 emissions (%) in 2013
Belgium	0%	0%	0%	-1%	0%	0%	35%
Bulgaria	1%	0%	-3%	0%	0%	0%	12%
Czech Republic	0%	0%	0%	0%	0%	0%	17%
Denmark	0%	0%	0%	0%	0%	0%	20%
Germany	4%	9%	0%	-1%	-1%	-4%	22%
Estonia	18%	3%	0%	-1%	3%	1%	5%
Ireland	0%	-1%	0%	0%	0%	0%	26%
Greece	3%	2%	1%	2%	2%	0%	9%
Spain	0%	0%	0%	0%	0%	0%	27%
France	0%	0%	-1%	5%	0%	0%	26%
Croatia	NE	NE	NE	11%	-1%	0%	26%
Italy	0%	0%	0%	0%	0%	0%	40%
Cyprus	NO	NO	NO	NO	NO	NO	-
Latvia	0%	0%	0%	0%	0%	0%	42%
Lithuania	0%	0%	27%	0%	0%	0%	28%
Luxembourg	0%	0%	0%	0%	0%	0%	22%
Hungary	0%	0%	0%	0%	0%	0%	43%
Malta	NO	NO	NO	NO	NO	NO	-
Netherlands	0%	0%	0%	0%	0%	-1%	47%
Austria	-1%	-5%	-1%	-1%	0%	0%	29%
Poland	0%	-2%	0%	0%	0%	0%	9%
Portugal	0%	0%	0%	-1%	0%	0%	20%
Romania	0%	0%	0%	0%	0%	0%	33%
Slovenia	0%	0%	0%	0%	0%	0%	11%
Slovakia	0%	0%	0%	0%	0%	0%	35%
Finland	0%	0%	0%	0%	0%	0%	13%
Sweden	1%	12%	-10%	0%	0%	0%	5%
United Kingdom	0%	0%	0%	0%	0%	0%	35%
EU 27 /28	**-1%**	**-1%**	**0%**	**0%**	**0%**	**-1%**	26%
<+/- 2%	22 MS	19 MS	22 MS	24 MS	24 MS	25 MS	
+/-2-5%	2 MS	3 MS	1 MS	1 MS	2 MS	1 MS	
> +/- 5%	1 MS	3 MS	2 MS	1 MS	0 MS	0 MS	

Note: Data for Croatia is included from 2011 onwards.
NE is used for countries for which data could not be estimated, as they were not available or are incomplete.
NO is reported if there is no natural gas consumption in the country.
GHG inventory data = 100%, a positive value indicates that annual Eurostat data is higher than GHG inventory data, a negative value indicates that annual Eurostat data is lower than GHG inventory data.

Source: Extraction from Eurostat database and GHG inventory submission to UNFCCC in the specific year

3.5. Conclusion

The application of the trend method to estimate early CO_2 emissions for all EU Member States represents a robust procedure that adjusts systematic errors of under- or overreporting in monthly data. The advantage of the method is the simplicity that ensures a fast and straightforward calculation for each Member State. By applying the trend change method, inconsistencies in the reporting of monthly energy data compared to annual or GHG inventory data can be levelled out, if these inconsistencies persist through the entire time series of Eurostat monthly energy data on for the different fuel groups. In comparison to the reporting of annual and Member State specific energy data used for GHG inventories, some Member States underestimate monthly data, as the monthly reporting might not include all installations. Also international bunker fuels are not always or only incompletely reported in monthly data by some Member States and can therefore not be subtracted from consumption.

The use of a trend change method requires a consistent reporting over two consecutive years. Any changes in reporting including improvements, can affect the trend changes in a negative way leading to higher deviations between early CO_2 estimates and final GHG inventory data on CO_2 emissions from fuel combustion. Nevertheless over the duration of the current project the quality of the monthly data appears to have improved, which further strengthens the suitability of the trend change method.

In general the application of a harmonized method for all 28 EU Member States depends on the data quality, which continues to differ from year to year and from country to country. Thus for some countries the data quality is still not sufficient to produce reliable estimates. Adaptations of monthly data by applying gap filling procedures can further improve the results, but this is not fully in line with the objective of having a reliable, harmonized method for all Member States. A further improvement of monthly data reported to Eurostat and a constant reporting quality over the years is needed in all Member States.

4. References

Eurostat data:

- Eurostat Monthly Oil and Gas Questionnaires (2008, 2009 and 2010, 2011, 2012, 2013, 2014 submissions)
- Eurostat Monthly Coal Questionnaire (2008, 2009, 2010, 2011, 2012, 2013, 2014 submissions)
- Data from Eurostat database for monthly and annual fuel consumption for the years 2008 – 2014 normally extracted between mid and end April in the year after the reference year

Inventory data: Data as reported by Member States to the UNFCCC in CRF table 1.A.(b).Submissions 2010-2014 for the years 2008 -2013: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php

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5. Annex

5.1. Comparison of early CO_2 emission estimates for liquid, solid and gaseous CO_2 emissions

Table 5-1: Comparison of early CO_2 emission estimates with final inventory CO_2 emissions from liquid, solid and gaseous fuel consumption in 2012

Member States	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF
	Liquid fuels			Solid fuels			Gaseous fuels		
Total	Change 2012/2011		%	Change 2012/2011		%	Change 2012/2011		%
Belgium	1.3%	-5.8%	7.1%	-11.5%	-13.9%	2.4%	-30.5%	-4.2%	-26.3%
Bulgaria	11.1%	5.5%	5.6%	-11.3%	-14.0%	2.7%	-12.3%	-4.9%	-7.4%
Czech Republic	-0.6%	-2.8%	2.2%	-7.7%	-7.8%	0.2%	-0.9%	0.7%	-1.6%
Denmark	-1.1%	-5.0%	3.9%	-21.8%	-21.4%	-0.4%	-8.4%	-6.0%	-2.3%
Germany	-1.6%	1.8%	-3.4%	3.2%	4.6%	-1.4%	0.6%	1.5%	-0.9%
Estonia	-18.4%	-3.2%	-15.2%	0.1%	-7.2%	7.4%	11.3%	2.5%	8.8%
Ireland	-10.3%	-11.6%	1.3%	19.8%	15.2%	4.6%	-2.2%	-2.8%	0.5%
Greece	-5.8%	-12.8%	7.0%	7.0%	2.8%	4.2%	-7.7%	-7.4%	-0.2%
Spain	-8.4%	-9.4%	1.0%	21.0%	23.3%	-2.3%	-2.4%	-2.8%	0.4%
France	-3.0%	-1.0%	-2.0%	14.7%	10.7%	4.0%	-3.1%	3.2%	-6.3%
Italy	-8.1%	-8.7%	0.6%	0.0%	1.0%	-1.0%	-3.7%	-3.6%	-0.1%
Cyprus	-8.0%	-5.6%	-2.4%	-100.0%	-96.0%	-4.0%	-	NA,NO	-
Latvia	-0.2%	-1.7%	1.5%	-0.5%	-17.2%	16.6%	-6.0%	-6.1%	0.2%
Lithuania	2.7%	4.2%	-1.5%	10.6%	-2.0%	12.6%	-2.3%	-5.8%	3.5%
Luxembourg	-2.6%	-3.0%	0.5%	-7.2%	-3.6%	-3.6%	1.5%	1.5%	0.0%
Hungary	-7.3%	-4.0%	-3.2%	7.0%	-2.0%	9.0%	-6.2%	-12.0%	5.8%
Malta	6.3%	5.6%	0.7%	-	NA,NE,NO	-	-	IE,NO	-
Netherlands	1.3%	0.0%	1.3%	-2.9%	10.2%	-13.1%	-7.0%	-4.2%	-2.8%
Austria	-2.2%	-2.7%	0.4%	-16.0%	-7.3%	-8.7%	-0.4%	-4.8%	4.4%
Poland	-7.3%	-2.3%	-5.1%	-5.7%	-6.7%	1.0%	6.2%	5.2%	1.0%
Portugal	-12.8%	-7.6%	-5.2%	31.7%	31.2%	0.6%	-9.6%	-11.9%	2.3%
Romania	-4.0%	-2.7%	-1.3%	-6.6%	-4.3%	-2.3%	-2.5%	-2.6%	0.1%
Slovenia	-2.7%	-2.0%	-0.6%	-1.4%	-4.6%	3.2%	-5.8%	-3.7%	-2.1%
Slovakia	-7.5%	-3.6%	-3.9%	-7.1%	-11.8%	4.7%	-4.9%	-5.2%	0.3%
Finland	-8.1%	-12.1%	4.0%	-16.2%	-22.7%	6.5%	-10.5%	-11.4%	0.9%
Sweden	-7.1%	-9.6%	2.4%	-24.2%	-8.1%	-16.2%	-12.7%	-14.0%	1.3%
United Kingdom	-2.4%	-1.5%	-0.9%	26.8%	27.6%	-0.8%	-5.5%	-5.4%	-0.1%
EU 15	-4.1%	-3.9%	**-0.2%**	7.1%	8.1%	**-1.0%**	-4.7%	-2.5%	**-2.2%**
EU 12	-4.1%	-1.9%	**-2.2%**	-6.0%	-7.4%	**1.4%**	-1.7%	-2.6%	**0.9%**
EU 27	-4.1%	-3.7%	**-0.5%**	2.4%	2.6%	**-0.2%**	-4.4%	-2.5%	**-1.8%**

Source: Authors' own estimates

Table 5-2: Comparison of early CO_2 emission estimates with final inventory CO_2 emissions from liquid, solid and gaseous fuel consumption in 2013

Member States	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF	Eurostat early CO_2 estimates	Member States GHG inventory emission data (CRF table 1.A(b))	Difference trend changes Monhtly-CRF
	Liquid fuels			Solid fuels			Gaseous fuels		
Total	Change 2013/2012		%	Change 2013/2012		%	Change 2013/2012		%
Belgium	0.5%	7.9%	-7.4%	-0.9%	6.2%	-7.2%	-1.1%	0.1%	-1.2%
Bulgaria	-4.5%	-8.4%	3.9%	-14.8%	-14.9%	0.1%	4.3%	-3.6%	7.8%
Czech Republic	-2.6%	-2.5%	-0.1%	-4.5%	-3.4%	-1.1%	3.0%	1.5%	1.5%
Denmark	-0.3%	-1.8%	1.5%	26.6%	28.2%	-1.5%	-4.4%	-5.2%	0.9%
Germany	1.4%	4.8%	-3.4%	-0.8%	2.3%	-3.1%	8.3%	8.9%	-0.5%
Estonia	-33.5%	-15.7%	-17.8%	7.9%	17.0%	-9.2%	1.7%	-20.8%	22.6%
Ireland	2.5%	-1.0%	3.4%	-15.1%	-10.6%	-4.5%	-3.0%	-3.7%	0.7%
Greece	-6.7%	-10.4%	3.7%	-12.8%	-14.0%	1.2%	-11.8%	-12.6%	0.8%
Spain	-6.6%	-3.8%	-2.8%	-31.7%	-28.6%	-3.0%	-7.7%	-7.4%	-0.3%
France	-1.8%	-4.1%	2.3%	6.7%	9.9%	-3.2%	3.1%	1.6%	1.5%
Italy	-5.1%	-6.4%	1.3%	-10.5%	-12.8%	2.3%	-6.5%	-6.9%	0.4%
Cyprus	-14.7%	-14.2%	-0.5%	NO	NO	-	NO	NO	-
Latvia	-4.0%	-0.8%	-3.2%	-31.3%	-20.9%	-10.3%	-1.0%	-2.1%	1.1%
Lithuania	-2.2%	-3.5%	1.3%	17.4%	15.0%	2.4%	-18.5%	-15.2%	-3.3%
Luxembourg	0.4%	-1.7%	2.1%	-15.6%	-12.9%	-2.7%	-15.0%	-15.5%	0.5%
Hungary	1.4%	-3.0%	4.4%	-10.0%	-9.7%	-0.2%	-10.7%	-7.1%	-3.7%
Malta	-6.8%	-10.5%	3.7%	NO	NO	-	NO	NO	-
Netherlands	-3.6%	-4.6%	1.0%	0.2%	0.2%	0.0%	1.9%	1.8%	0.1%
Austria	1.9%	2.2%	-0.4%	-7.4%	0.0%	-7.4%	-5.4%	-6.2%	0.8%
Poland	-6.6%	-7.7%	1.1%	2.4%	4.3%	-1.9%	0.9%	1.0%	-0.1%
Portugal	11.8%	2.0%	9.8%	-8.7%	-9.0%	0.3%	-3.8%	-11.8%	8.0%
Romania	-5.0%	-3.9%	-1.1%	-28.0%	-23.6%	-4.4%	-7.5%	-8.5%	1.0%
Slovenia	-12.0%	-4.2%	-7.8%	-17.1%	-4.3%	-12.8%	6.9%	-2.6%	9.5%
Slovakia	-2.8%	-8.1%	5.3%	-5.3%	-6.5%	1.2%	-9.9%	9.8%	-19.6%
Finland	-10.6%	-12.2%	1.7%	7.8%	13.0%	-5.3%	-5.5%	-7.0%	1.5%
Sweden	-5.7%	-8.9%	3.2%	3.9%	1.0%	2.9%	-4.8%	-5.6%	0.8%
United Kingdom	-2.3%	-2.1%	-0.2%	-4.0%	-7.7%	3.7%	-0.9%	-0.5%	-0.5%
EU 15	-2.1%	-2.0%	**-0.1%**	-4.4%	-3.3%	**-1.1%**	-0.3%	-0.5%	**0.2%**
EU 13	-5.3%	-6.0%	**0.7%**	-3.2%	-0.9%	**-2.3%**	-4.0%	-2.7%	**-1.4%**
EU 28	-2.5%	-2.5%	**0.0%**	-4.0%	-2.5%	**-1.5%**	-0.7%	-0.7%	**0.0%**

Source: Authors' own estimates

5.2. Data tables

Table 5-3: Differences between annual and monthly Eurostat energy data on apparent fuel consumption

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%
Belgium	2008	23,216	21,726	-1,490	-6%	6,813	6,395	-418	-6%	621,244	507,678	-113,566	-18%
	2009	23,329	22,489	-840	-4%	4,716	3,783	-933	-20%	632,699	566,504	-66,196	-10%
	2010	24,632	22,071	-2,561	-10%	5,005	1,245	-3,760	-75%	710,075	580,711	-129,364	-18%
	2011	21,750	21,580	-170	-1%	4,603	2,692	-1,911	-42%	636,087	474,624	-161,463	-25%
	2012	20,532	21,866	1,334	6%	4,586	4,032	-554	-12%	601,475	329,770	-271,706	-45%
	2013	21,502	21,984	482	2%	4,970	3,994	-976	-20%	602,704	594,578	-8,126	-1%
	2014		22,469				4,678				520,738		
Bulgaria	2008	4,606	4,928	322	7%	32,927	33,494	567	2%	122,012	122,106	94	0%
	2009	4,152	4,450	298	7%	30,147	30,291	144	0%	90,465	87,312	-3,154	-3%
	2010	3,789	3,263	-526	-14%	32,691	32,554	-137	0%	93,838	96,202	2,364	3%
	2011	3,592	3,306	-286	-8%	40,208	40,241	33	0%	110,124	105,458	-4,666	-4%
	2012	3,840	3,673	-167	-4%	35,273	35,683	410	1%	102,625	92,539	-10,086	-10%
	2013	3,486	3,509	23	1%	30,585	30,409	-176	-1%	99,977	96,513	-3,464	-3%
	2014		3,684				33,281				95,599		
Czech Republic	2008	9,266	9,276	10	0%	54,532	54,284	-248	0%	298,119	297,920	-199	0%
	2009	8,920	8,932	12	0%	51,136	51,331	195	0%	281,624	280,985	-639	0%
	2010	8,841	8,470	-371	-4%	51,949	50,010	-1,939	-4%	335,723	322,084	-13,639	-4%
	2011	8,445	8,276	-169	-2%	52,657	53,061	404	1%	283,607	283,617	10	0%
	2012	8,288	8,227	-61	-1%	49,222	49,001	-221	0%	287,051	281,038	-6,014	-2%
	2013	8,010	8,013	3	0%	46,243	46,801	558	1%	290,832	289,558	-1,274	0%
	2014		8,459				45,718				258,585		
Denmark	2008	7,208	6,865	-343	-5%	6,872	6,867	-5	0%	170,741	168,637	-2,104	-1%
	2009	6,950	6,690	-260	-4%	6,808	6,858	50	1%	163,437	163,416	-22	0%
	2010	5,977	7,247	1,270	21%	6,521	6,532	11	0%	185,203	183,258	-1,945	-1%
	2011	6,422	6,561	139	2%	5,546	5,538	-8	0%	155,640	150,786	-4,854	-3%
	2012	6,182	6,490	308	5%	4,271	4,331	60	1%	145,886	138,151	-7,736	-5%
	2013	5,950	6,487	537	9%	5,364	5,485	121	2%	138,833	139,353	520	0%
	2014		6,163				4,447				116,431		
Germany	2008	107,391	106,410	-981	-1%	242,011	239,652	-2,359	-1%	3,205,279	3,222,446	17,167	1%
	2009	101,487	100,356	-1,131	-1%	224,048	222,166	-1,882	-1%	3,206,219	3,199,675	-6,544	0%
	2010	102,206	100,721	-1,485	-1%	231,059	223,270	-7,789	-3%	3,073,352	3,390,003	316,651	10%
	2011	98,928	98,546	-382	0%	236,753	232,287	-4,466	-2%	2,756,188	2,797,036	40,848	1%
	2012	98,215	96,976	-1,239	-1%	247,526	239,616	-7,910	-3%	2,923,196	2,814,948	-108,248	-4%
	2013	99,737	98,874	-863	-1%	247,279	237,599	-9,680	-4%	3,051,546	3,075,491	23,944	1%
	2014		97,437				233,670				2,738,165		

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%
Estonia	2008	617	1,011	394	64%	16,046	16,294	248	2%	32,260	30,491	-1,769	-5%
	2009	453	936	483	107%	14,066	15,454	1,388	10%	21,986	19,335	-2,651	-12%
	2010	460	996	536	117%	18,207	18,258	51	0%	23,551	20,730	-2,822	-12%
	2011	462	989	527	114%	19,023	19,124	101	1%	21,072	20,508	-563	-3%
	2012	495	807	312	63%	17,822	19,146	1,324	7%	22,835	22,835	0	0%
	2013	420	310	-110	-26%	20,770	20,649	-121	-1%	23,233	23,233	0	0%
	2014		269				20,556				18,236		
Ireland	2008	7,406	6,995	-411	-6%	6,470	5,164	-1,306	-20%	187,666	148,332	-39,335	-21%
	2009	7,018	7,005	-13	0%	6,177	5,103	-1,074	-17%	179,356	179,431	76	0%
	2010	6,831	7,171	340	5%	5,965	3,251	-2,714	-45%	196,608	198,245	1,637	1%
	2011	6,019	6,412	393	7%	5,837	5,917	80	1%	172,361	177,456	5,095	3%
	2012	5,859	5,750	-109	-2%	6,618	7,104	486	7%	168,076	173,475	5,399	3%
	2013	5,946	5,891	-55	-1%	5,890	6,032	142	2%	161,940	168,227	6,287	4%
	2014		5,733				6,270				162,531		
Greece	2008	16,667	16,981	314	2%	65,156	63,171	-1,985	-3%	146,795	146,842	47	0%
	2009	15,942	16,363	421	3%	65,551	62,025	-3,526	-5%	124,388	124,326	-62	0%
	2010	14,226	14,977	751	5%	58,319	50,108	-8,211	-14%	135,398	135,398	0	0%
	2011	12,571	12,718	147	1%	60,358	57,015	-3,343	-6%	166,310	166,218	-92	0%
	2012	12,501	11,978	-523	-4%	62,261	60,978	-1,283	-2%	153,325	153,502	177	0%
	2013	10,664	11,181	517	5%	54,688	53,193	-1,495	-3%	135,497	135,392	-104	0%
	2014		10,992				49,200				103,783		
Spain	2008	64,388	65,638	1,250	2%	25,903	25,373	-530	-2%	1,461,599	1,456,392	-5,207	0%
	2009	59,786	60,953	1,167	2%	19,571	21,589	2,018	10%	1,309,163	1,307,858	-1,306	0%
	2010	57,309	57,490	181	0%	14,451	15,426	975	7%	1,305,770	1,303,618	-2,153	0%
	2011	54,007	54,060	53	0%	23,926	24,695	769	3%	1,213,828	1,211,493	-2,335	0%
	2012	49,043	49,504	461	1%	28,693	29,881	1,188	4%	1,180,239	1,182,644	2,405	0%
	2013	46,305	46,235	-70	0%	20,633	20,420	-213	-1%	1,092,028	1,092,011	-16	0%
	2014		45,406				21,961				990,950		
France	2008	83,231	85,477	2,246	3%	19,315	19,308	-7	0%	1,669,912	1,660,017	-9,896	-1%
	2009	81,024	82,444	1,420	2%	17,287	16,918	-369	-2%	1,610,319	1,487,191	-123,128	-8%
	2010	76,266	77,522	1,256	2%	18,162	18,912	750	4%	1,781,056	1,735,830	-45,225	-3%
	2011	75,648	80,064	4,416	6%	15,596	16,345	749	5%	1,550,868	1,572,071	21,202	1%
	2012	73,110	77,623	4,513	6%	17,342	18,795	1,453	8%	1,600,211	1,523,371	-76,840	-5%
	2013	70,701	72,122	1,421	2%	18,824	20,052	1,228	7%	1,633,145	1,570,531	-62,614	-4%
	2014		71,206				14,774				1,364,721		

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%
Croatia	2008												
	2009												
	2010												
	2011	3,403	3,390	-13	0%	1,225	1,213	-12	-1%	119,567	112,505	-7,062	-6%
	2012	3,178	3,158	-20	-1%	1,080	1,073	-7	-1%	101,038	91,488	-9,550	-9%
	2013	3,017	3,083	66	2%	1,139	1,146	7	1%	95,537	87,207	-8,330	-9%
	2014		2,903				1,099				79,616		
Italy	2008	72,769	70,685	-2,084	-3%	24,679	25,548	869	4%	2,910,639	2,906,557	-4,081	0%
	2009	67,598	67,028	-570	-1%	19,681	18,730	-951	-5%	2,675,445	2,678,942	3,497	0%
	2010	65,434	64,005	-1,429	-2%	21,595	20,209	-1,386	-6%	2,849,396	2,845,490	-3,906	0%
	2011	62,955	61,351	-1,604	-3%	24,172	24,337	165	1%	2,671,770	2,668,861	-2,909	0%
	2012	55,917	56,387	470	1%	24,950	24,345	-605	-2%	2,568,837	2,569,179	342	0%
	2013	53,455	53,510	55	0%	21,632	21,783	151	1%	2,402,667	2,402,257	-410	0%
	2014		51,351				20,975				2,122,967		
Cyprus	2008	2,520	2,371	-149	-6%	41	42	1	2%				
	2009	2,457	2,464	7	0%	22	21	-1	-5%				
	2010	2,395	2,407	12	1%	27	26	-1	-4%				
	2011	2,294	2,314	20	1%	13	11	-2	-15%				
	2012	2,169	2,128	-41	-2%	1	0	-1	-100%				
	2013	1,837	1,816	-21	-1%	1	0	-1	-100%				
	2014		1,878				4						
Latvia	2008	1,414	1,364	-50	-4%	176	174	-2	-1%	55,814	55,814	1	0%
	2009	1,172	1,170	-2	0%	138	148	10	7%	51,380	51,329	-51	0%
	2010	1,080	1,070	-10	-1%	180	182	2	1%	61,206	61,210	4	0%
	2011	1,103	1,149	46	4%	194	193	-1	-1%	53,943	53,943	0	0%
	2012	1,265	1,147	-118	-9%	148	192	44	30%	50,709	50,716	7	0%
	2013	1,254	1,101	-153	-12%	131	132	1	1%	50,438	50,200	-238	0%
	2014		1,197				100				45,274		
Lithuania	2008	2,774	2,880	106	4%	385	384	-1	0%	108,674	108,607	-68	0%
	2009	2,301	2,316	15	1%	291	281	-10	-3%	91,327	91,327	0	0%
	2010	2,297	2,338	41	2%	358	386	28	8%	104,321	104,386	65	0%
	2011	2,171	2,183	12	1%	447	395	-52	-12%	113,799	113,765	-34	0%
	2012	2,261	2,242	-19	-1%	442	437	-5	-1%	111,119	111,118	-2	0%
	2013	2,180	2,193	13	1%	513	513	0	0%	90,624	90,554	-69	0%
	2014		2,384				428				86,157		

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%
Luxembourg	2008	2,443	2,627	184	8%	124	108	-16	-13%	45,771	44,215	-1,556	-3%
	2009	2,267	2,443	176	8%	113	99	-14	-12%	46,577	46,579	2	0%
	2010	2,384	2,698	314	13%	113	97	-16	-14%	50,099	50,144	45	0%
	2011	2,536	2,502	-34	-1%	99	97	-2	-2%	43,219	43,217	-2	0%
	2012	2,495	2,437	-58	-2%	92	90	-2	-2%	44,006	43,857	-149	0%
	2013	2,433	2,446	13	1%	80	76	-4	-5%	37,258	37,259	1	0%
	2014		2,287				78				35,302		
Hungary	2008	6,938	7,027	89	1%	11,521	11,560	39	0%	442,161	452,598	10,437	2%
	2009	6,847	6,699	-148	-2%	10,542	10,442	-100	-1%	383,171	381,139	-2,032	-1%
	2010	6,410	6,016	-394	-6%	10,676	10,764	88	1%	410,955	359,447	-51,508	-13%
	2011	6,056	6,156	100	2%	11,263	11,281	18	0%	391,631	382,581	-9,050	-2%
	2012	5,726	5,708	-18	0%	11,057	11,100	43	0%	347,753	358,854	11,102	3%
	2013	5,520	5,787	267	5%	10,683	10,796	113	1%	322,601	320,365	-2,237	-1%
	2014		6,038				10,359				292,156		
Malta	2008	836	0	-836									
	2009	745	396	-349	-47%								
	2010	845	856	11	1%								
	2011	1,099	793	-306	-28%								
	2012	772	1,031	259	34%								
	2013	733	713	-20	-3%								
	2014		730										
Netherlands	2008	29,404	29,193	-211	-1%	12,888	12,575	-313	-2%	1,450,976	1,507,257	56,281	4%
	2009	28,771	28,785	14	0%	12,018	11,876	-142	-1%	1,464,133	1,453,700	-10,433	-1%
	2010	29,424	29,994	570	2%	12,117	11,988	-129	-1%	1,641,493	1,622,544	-18,949	-1%
	2011	28,518	28,600	82	0%	11,939	16,471	4,532	38%	1,432,013	1,470,612	38,599	3%
	2012	29,486	28,973	-513	-2%	13,143	15,997	2,854	22%	1,372,878	1,367,723	-5,155	0%
	2013	28,115	27,926	-189	-1%	13,080	12,890	-190	-1%	1,383,983	1,394,339	10,355	1%
	2014		26,657				13,183				1,217,665		
Austria	2008	12,549	13,162	613	5%	5,457	4,648	-809	-15%	312,835	302,307	-10,527	-3%
	2009	11,981	12,942	961	8%	4,273	3,844	-429	-10%	300,038	296,735	-3,303	-1%
	2010	12,068	13,378	1,310	11%	5,015	4,930	-85	-2%	343,922	328,372	-15,549	-5%
	2011	11,588	12,995	1,407	12%	5,165	4,786	-379	-7%	324,678	308,406	-16,272	-5%
	2012	11,483	12,706	1,223	11%	4,825	4,018	-807	-17%	310,433	307,210	-3,224	-1%
	2013	11,680	12,262	582	5%	4,911	4,449	-462	-9%	293,567	290,772	-2,795	-1%
	2014		11,353				4,563				267,122		

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%
Poland	2008	23,894	20,328	-3,566	-15%	134,794	140,511	5,717	4%	525,307	541,589	16,282	3%
	2009	23,531	23,272	-259	-1%	127,528	129,570	2,042	2%	502,567	512,955	10,388	2%
	2010	24,715	24,351	-364	-1%	133,746	129,522	-4,224	-3%	536,108	535,396	-713	0%
	2011	24,876	25,177	301	1%	138,699	142,424	3,725	3%	537,434	535,915	-1,519	0%
	2012	23,762	23,329	-433	-2%	132,657	134,291	1,634	1%	569,447	569,380	-67	0%
	2013	21,548	21,781	233	1%	137,505	137,563	58	0%	574,674	574,372	-302	0%
	2014		21,377				129,964				562,338		
Portugal	2008	12,313	12,942	629	5%	4,160	4,200	40	1%	173,272	172,983	-289	0%
	2009	11,467	11,854	387	3%	4,680	4,747	67	1%	176,567	175,348	-1,219	-1%
	2010	11,170	11,740	570	5%	2,705	2,442	-263	-10%	187,935	139,263	-48,672	-26%
	2011	10,528	10,840	312	3%	3,700	3,700	0	0%	186,884	186,444	-440	0%
	2012	8,911	9,457	546	6%	4,874	4,874	0	0%	164,651	168,567	3,916	2%
	2013	9,224	10,569	1,345	15%	4,449	4,450	1	0%	157,251	162,206	4,955	3%
	2014		9,725				4,519				149,900		
Romania	2008	9,980	10,090	110	1%	40,384	38,719	-1,665	-4%	521,348	503,913	-17,435	-3%
	2009	8,463	8,141	-322	-4%	35,136	32,091	-3,045	-9%	443,775	436,497	-7,277	-2%
	2010	8,807	8,394	-413	-5%	32,649	32,815	166	1%	451,681	462,542	10,861	2%
	2011	8,675	8,871	196	2%	39,010	38,269	-741	-2%	464,946	477,898	12,952	3%
	2012	8,487	8,519	32	0%	35,870	35,757	-113	0%	452,715	465,882	13,167	3%
	2013	7,987	8,094	107	1%	26,669	25,754	-915	-3%	410,052	430,846	20,794	5%
	2014		8,188				25,840				404,690		
Slovenia	2008	2,916	2,857	-59	-2%	5,236	4,887	-349	-7%	36,789	34,962	-1,828	-5%
	2009	2,528	2,472	-56	-2%	4,972	4,755	-217	-4%	34,815	33,599	-1,216	-3%
	2010	2,514	2,529	15	1%	4,955	4,928	-27	-1%	36,125	34,594	-1,531	-4%
	2011	2,552	2,533	-19	-1%	5,064	4,952	-112	-2%	30,883	28,765	-2,118	-7%
	2012	2,503	2,465	-38	-2%	4,985	4,882	-103	-2%	29,730	27,091	-2,639	-9%
	2013	2,398	2,169	-229	-10%	4,487	4,045	-442	-10%	28,967	28,954	-13	0%
	2014		2,188				3,163				26,241		
Slovakia	2008	3,493	3,490	-3	0%	8,098	8,613	515	6%	216,303	195,151	-21,152	-10%
	2009	3,192	3,342	150	5%	7,715	7,806	91	1%	185,238	223,225	37,987	21%
	2010	3,372	3,410	38	1%	7,609	6,871	-738	-10%	209,609	212,203	2,594	1%
	2011	3,306	3,311	5	0%	7,415	7,557	142	2%	194,144	237,008	42,864	22%
	2012	3,135	3,062	-73	-2%	6,982	7,029	47	1%	182,768	225,478	42,710	23%
	2013	3,048	2,977	-71	-2%	6,847	6,657	-190	-3%	201,571	203,223	1,651	1%
	2014		2,869				6,522				133,253		

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%	Annual	Cumulated Monthly	Difference absolute	%
Finland	2008	9,576	9,987	411	4%	12,995	11,875	-1,120	-9%	161,316	166,348	5,032	3%
	2009	9,129	9,292	163	2%	12,761	12,239	-522	-4%	145,872	145,871	-1	0%
	2010	8,426	9,344	918	11%	16,750	16,186	-564	-3%	160,668	149,836	-10,832	-7%
	2011	9,054	8,755	-299	-3%	14,206	13,841	-365	-3%	140,674	140,148	-526	0%
	2012	7,887	8,046	159	2%	11,336	11,593	257	2%	125,819	125,385	-434	0%
	2013	7,187	7,196	9	0%	11,507	11,337	-170	-1%	119,611	118,526	-1,085	-1%
	2014		8,196				10,755				104,086		
Sweden	2008	13,205	13,006	-199	-2%	4,204	4,174	-30	-1%	34,605	34,564	-41	0%
	2009	11,546	11,595	49	0%	3,423	2,844	-579	-17%	50,938	46,529	-4,409	-9%
	2010	13,353	13,600	247	2%	4,248	4,637	389	9%	54,969	106,010	51,041	93%
	2011	13,541	13,204	-337	-2%	4,239	4,133	-106	-3%	48,287	48,214	-73	0%
	2012	12,341	12,262	-79	-1%	3,659	3,131	-528	-14%	42,144	42,098	-47	0%
	2013	11,404	11,558	154	1%	3,669	3,252	-417	-11%	39,996	40,068	72	0%
	2014		11,471				3,398				33,245		
United Kingdom	2008	64,707	74,353	9,646	15%	58,503	58,214	-289	0%	3,536,479	3,626,832	90,353	3%
	2009	61,626	77,320	15,694	25%	48,319	48,685	366	1%	3,270,733	3,215,405	-55,328	-2%
	2010	60,661	73,331	12,670	21%	50,230	50,285	55	0%	3,550,973	3,525,830	-25,143	-1%
	2011	58,510	69,116	10,606	18%	49,797	50,109	312	1%	2,939,218	2,934,731	-4,487	0%
	2012	55,995	67,485	11,490	21%	63,316	63,554	238	0%	2,777,984	2,773,037	-4,947	0%
	2013	55,371	65,912	10,541	19%	60,778	61,027	249	0%	2,750,037	2,747,482	-2,555	0%
	2014		55,419				48,781				2,511,757		
EU 15	2008	526,473	536,047	9,574	2%	495,550	487,272	-8,278	-2%	16,089,129	16,071,406	-17,723	0%
	2009	499,921	517,558	17,637	4%	449,426	441,506	-7,920	-2%	15,355,883	15,087,507	-268,376	-2%
	2010	490,367	505,289	14,922	3%	452,255	429,518	-22,737	-5%	16,226,916	16,294,551	67,635	0%
	2011	472,575	487,304	14,729	3%	465,936	461,965	-3,971	-1%	14,438,024	14,350,316	-87,708	-1%
	2012	449,957	467,941	17,984	4%	497,492	492,339	-5,153	-1%	14,179,161	13,712,916	-466,245	-3%
	2013	439,674	454,153	14,479	3%	477,754	466,038	-11,716	-2%	14,000,062	13,968,491	-31,570	0%
	2014		435,865				441,252				12,439,362		
EU 28	2008	595,727	601,670	5,943	1%	799,690	796,234	-3,456	0%	18,447,915	18,414,556	-33,359	0%
	2009	564,682	582,149	17,467	3%	731,119	723,696	-7,423	-1%	17,442,230	17,205,208	-237,022	-1%
	2010	555,892	569,390	13,498	2%	745,302	715,834	-29,468	-4%	18,490,035	18,503,345	13,311	0%
	2011	540,609	555,752	15,143	3%	781,154	780,686	-468	0%	16,759,174	16,702,279	-56,894	0%
	2012	515,838	533,437	17,599	3%	793,031	790,930	-2,101	0%	16,436,950	16,009,333	-427,617	-3%
	2013	501,112	515,699	14,587	3%	763,327	750,503	-12,824	-2%	16,188,567	16,163,517	-25,051	0%
	2014		498,029				718,286				14,441,507		

Source: Extraction Eurostat database in the specific year

Table 5-4: Differences between GHG inventory data and Eurostat monthly energy data in apparent fuel consumption

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%
Belgium	2008	21,726	23,551	-1,825	-8%	6,395	6,812	-417	-6%	507,678	622,938	-115,260	-19%
	2009	22,489	23,033	-544	-2%	3,783	4,869	-1,086	-22%	566,504	634,426	-67,923	-11%
	2010	22,071	24,049	-1,978	-8%	1,245	5,059	-3,814	-75%	580,711	712,012	-131,302	-18%
	2011	21,580	21,975	-395	-2%	2,692	4,589	-1,897	-41%	474,624	640,285	-165,661	-26%
	2012	21,866	20,548	1,318	6%	4,032	4,542	-510	-11%	329,770	601,475	-271,706	-45%
	2013	21,984	21,965	19	0%	3,994	4,917	-923	-19%	594,578	602,704	-8,126	-1%
	2014	22,469				4,678				520,738			
Bulgaria	2008	4,928	4,580	348	8%	33,494	32,666	828	3%	122,106	121,353	753	1%
	2009	4,450	4,161	289	7%	30,291	28,562	1,729	6%	87,312	90,465	-3,154	-3%
	2010	3,263	3,810	-547	-14%	32,554	32,691	-137	0%	96,202	96,312	-110	0%
	2011	3,306	3,580	-274	-8%	40,241	40,208	33	0%	105,458	110,172	-4,713	-4%
	2012	3,673	3,797	-124	-3%	35,683	35,273	410	1%	92,539	102,637	-10,098	-10%
	2013	3,509	3,473	36	1%	30,409	30,585	-176	-1%	96,513	99,977	-3,464	-3%
	2014	3,684				33,281				95,599			
Czech Republic	2008	9,276	9,105	171	2%	54,284	53,993	291	1%	297,920	298,119	-199	0%
	2009	8,932	8,821	111	1%	51,331	50,791	540	1%	280,985	281,624	-639	0%
	2010	8,470	8,714	-244	-3%	50,010	51,687	-1,677	-3%	322,084	336,360	-14,276	-4%
	2011	8,276	8,171	105	1%	53,061	53,042	19	0%	283,617	283,607	10	0%
	2012	8,227	8,269	-42	-1%	49,001	50,486	-1,485	-3%	281,038	287,051	-6,014	-2%
	2013	8,013	7,955	58	1%	46,801	47,051	-250	-1%	289,558	291,435	-1,877	-1%
	2014	8,459				45,718				258,585			
Denmark	2008	6,865	7,122	-257	-4%	6,867	6,875	-8	0%	168,637	170,740	-2,103	-1%
	2009	6,690	6,549	141	2%	6,858	6,810	48	1%	163,416	163,436	-21	0%
	2010	7,247	6,844	403	6%	6,532	6,467	65	1%	183,258	185,204	-1,946	-1%
	2011	6,561	6,601	-40	-1%	5,538	5,489	49	1%	150,786	155,640	-4,854	-3%
	2012	6,490	6,032	458	8%	4,331	4,271	60	1%	138,151	145,885	-7,734	-5%
	2013	6,487	5,930	557	9%	5,485	5,479	6	0%	139,353	138,833	520	0%
	2014	6,163				4,447				116,431			
Germany	2008	106,410	103,866	2,544	2%	239,652	241,561	-1,909	-1%	3,222,446	3,069,942	152,504	5%
	2009	100,356	98,819	1,537	2%	222,166	224,909	-2,743	-1%	3,199,675	2,944,253	255,422	9%
	2010	100,721	101,490	-769	-1%	223,270	233,063	-9,793	-4%	3,390,003	3,074,942	315,061	10%
	2011	98,546	98,460	86	0%	232,287	237,524	-5,237	-2%	2,797,036	2,784,786	12,250	0%
	2012	96,976	99,143	-2,167	-2%	239,616	247,727	-8,111	-3%	2,814,948	2,966,298	-151,350	-5%
	2013	98,874	100,479	-1,605	-2%	237,599	246,447	-8,848	-4%	3,075,491	3,178,642	-103,151	-3%
	2014	97,437				233,670				2,738,165			

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%
Estonia	2008	1,011	112	899	805%	16,294	15,997	297	2%	30,491	27,438	3,053	11%
	2009	936	431	505	117%	15,454	13,996	1,458	10%	19,335	21,398	-2,063	-10%
	2010	996	489	507	104%	18,258	18,207	51	0%	20,730	23,547	-2,817	-12%
	2011	989	467	522	112%	19,124	19,026	98	1%	20,508	21,235	-727	-3%
	2012	807	460	347	76%	19,146	17,835	1,311	7%	22,835	22,109	726	3%
	2013	310	413	-103	-25%	20,649	20,770	-121	-1%	23,233	23,083	149	1%
	2014	269				20,556				18,236			
Ireland	2008	6,995	8,119	-1,124	-14%	5,164	5,856	-692	-12%	148,332	188,044	-39,712	-21%
	2009	7,005	8,552	-1,547	-18%	5,103	6,168	-1,065	-17%	179,431	180,410	-979	-1%
	2010	7,171	6,723	448	7%	3,251	6,003	-2,752	-46%	198,245	197,170	1,074	1%
	2011	6,412	6,152	260	4%	5,917	5,837	80	1%	177,456	172,744	4,712	3%
	2012	5,750	5,462	288	5%	7,104	6,197	907	15%	173,475	168,449	5,026	3%
	2013	5,891	5,762	129	2%	6,032	6,043	-11	0%	168,227	162,109	6,118	4%
	2014	5,733				6,270				162,531			
Greece	2008	16,981	16,719	262	2%	63,171	65,157	-1,986	-3%	146,842	142,441	4,401	3%
	2009	16,363	16,678	-315	-2%	62,025	65,405	-3,380	-5%	124,326	121,786	2,540	2%
	2010	14,977	14,521	456	3%	50,108	57,961	-7,853	-14%	135,398	134,493	905	1%
	2011	12,718	13,559	-841	-6%	57,015	60,359	-3,344	-6%	166,218	163,053	3,165	2%
	2012	11,978	11,713	265	2%	60,978	62,263	-1,285	-2%	153,502	150,030	3,472	2%
	2013	11,181	10,687	494	5%	53,193	54,688	-1,495	-3%	135,392	135,497	-104	0%
	2014	10,992				49,200				103,783			
Spain	2008	65,638	64,388	1,250	2%	25,373	25,903	-530	-2%	1,456,392	1,461,599	-5,207	0%
	2009	60,953	59,786	1,167	2%	21,589	19,493	2,096	11%	1,307,858	1,312,073	-4,215	0%
	2010	57,490	56,306	1,184	2%	15,426	14,451	975	7%	1,303,618	1,305,770	-2,153	0%
	2011	54,060	53,042	1,018	2%	24,695	23,926	769	3%	1,211,493	1,213,828	-2,335	0%
	2012	49,504	48,435	1,069	2%	29,881	28,693	1,188	4%	1,182,644	1,181,551	1,093	0%
	2013	46,235	45,467	768	2%	20,420	20,633	-213	-1%	1,092,011	1,093,235	-1,223	0%
	2014	45,406				21,961				990,950			
France	2008	85,477	85,715	-238	0%	19,308	21,636	-2,328	-11%	1,660,017	1,674,708	-14,691	-1%
	2009	82,444	79,528	2,916	4%	16,918	18,049	-1,131	-6%	1,487,191	1,607,340	-120,149	-7%
	2010	77,522	79,203	-1,681	-2%	18,912	19,859	-947	-5%	1,735,830	1,798,429	-62,598	-3%
	2011	80,064	78,604	1,460	2%	16,345	17,375	-1,029	-6%	1,572,071	1,482,516	89,555	6%
	2012	77,623	77,070	553	1%	18,795	19,473	-678	-3%	1,523,371	1,605,645	-82,274	-5%
	2013	72,122	73,018	-896	-1%	20,052	21,317	-1,265	-6%	1,570,531	1,629,936	-59,405	-4%
	2014	71,206				14,774				1,364,721			

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%
Croatia	2008												
	2009												
	2010												
	2011	3,390	3,522	-132	-4%	1,213	1,224	-11	-1%	112,505	107,610	4,895	5%
	2012	3,158	3,167	-9	0%	1,073	1,081	-8	-1%	91,488	101,781	-10,293	-10%
	2013	3,083	3,073	10	0%	1,146	1,138	8	1%	87,207	95,537	-8,329	-9%
	2014	2,903				1,099				79,616			
Italy	2008	70,685	76,214	-5,529	-7%	25,548	24,083	1,465	6%	2,906,557	2,908,665	-2,108	0%
	2009	67,028	72,318	-5,290	-7%	18,730	19,398	-668	-3%	2,678,942	2,673,630	5,312	0%
	2010	64,005	68,672	-4,667	-7%	20,209	21,333	-1,124	-5%	2,845,490	2,847,466	-1,976	0%
	2011	61,351	65,270	-3,919	-6%	24,337	23,824	513	2%	2,668,861	2,669,961	-1,100	0%
	2012	56,387	59,176	-2,789	-5%	24,345	24,500	-155	-1%	2,569,179	2,567,407	1,771	0%
	2013	53,510	55,913	-2,403	-4%	21,783	21,292	491	2%	2,402,257	2,402,951	-694	0%
	2014	51,351				20,975				2,122,967			
Cyprus	2008	2,371	2,365	6	0%	42	42	0	1%				
	2009	2,464	2,349	115	5%	21	21	0	-1%				
	2010	2,407	2,370	37	2%	26	26	0	0%				
	2011	2,314	2,294	20	1%	11	12	-1	-8%				
	2012	2,128	2,135	-7	0%	0	1	-1	-100%				
	2013	1,816	1,830	-14	-1%	0	13	-13	-100%				
	2014	1,878				4							
Latvia	2008	1,364	1,420	-56	-4%	174	176	-2	-1%	55,814	55,894	-80	0%
	2009	1,170	1,174	-4	0%	148	135	13	10%	51,329	51,493	-164	0%
	2010	1,070	1,115	-45	-4%	182	170	12	7%	61,210	61,313	-103	0%
	2011	1,149	1,089	60	6%	193	180	13	7%	53,943	53,998	-55	0%
	2012	1,147	1,226	-79	-6%	192	148	44	30%	50,716	50,812	-96	0%
	2013	1,101	1,192	-91	-8%	132	131	1	1%	50,200	50,544	-344	-1%
	2014	1,197				100				45,274			
Lithuania	2008	2,880	2,809	71	3%	384	351	33	9%	108,607	108,673	-66	0%
	2009	2,316	2,429	-113	-5%	281	267	14	5%	91,327	91,329	-2	0%
	2010	2,338	2,494	-156	-6%	386	331	55	17%	104,386	82,007	22,379	27%
	2011	2,183	2,372	-189	-8%	395	440	-45	-10%	113,765	113,817	-53	0%
	2012	2,242	2,425	-183	-8%	437	426	11	3%	111,118	111,132	-14	0%
	2013	2,193	2,372	-179	-8%	513	427	86	20%	90,554	90,608	-54	0%
	2014	2,384				428				86,157			

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%
Luxembourg	2008	2,627	2,484	143	6%	108	105	3	3%	44,215	45,744	-1,529	-3%
	2009	2,443	2,310	133	6%	99	113	-14	-12%	46,579	46,577	2	0%
	2010	2,698	2,390	308	13%	97	113	-16	-14%	50,144	50,099	45	0%
	2011	2,502	2,506	-4	0%	97	99	-2	-2%	43,217	43,219	-2	0%
	2012	2,437	2,404	33	1%	90	92	-2	-2%	43,857	44,005	-148	0%
	2013	2,446	2,363	83	4%	76	81	-5	-6%	37,259	37,258	1	0%
	2014	2,287				78				35,302			
Hungary	2008	7,027	6,983	45	1%	11,560	12,789	-1,229	-10%	452,598	442,161	10,437	2%
	2009	6,699	6,789	-90	-1%	10,442	11,073	-631	-6%	381,139	383,171	-2,032	-1%
	2010	6,016	6,449	-433	-7%	10,764	11,592	-828	-7%	359,447	410,955	-51,508	-13%
	2011	6,156	6,413	-257	-4%	11,281	11,983	-702	-6%	382,581	391,506	-8,925	-2%
	2012	5,708	5,779	-71	-1%	11,100	11,034	66	1%	358,854	347,753	11,102	3%
	2013	5,787	5,662	125	2%	10,796	10,648	148	1%	320,365	322,601	-2,237	-1%
	2014	6,038				10,359				292,156			
Malta	2008												
	2009	396	802	-405	-51%								
	2010	856	817	39	5%								
	2011	793	817	-24	-3%								
	2012	1,031	864	167	19%								
	2013	713	773	-60	-8%								
	2014	730											
Netherlands	2008	29,193	28,845	348	1%	12,575	12,960	-385	-3%	1,507,257	1,454,108	53,149	4%
	2009	28,785	28,017	768	3%	11,876	12,086	-210	-2%	1,453,700	1,465,789	-12,089	-1%
	2010	29,994	29,149	846	3%	11,988	12,253	-265	-2%	1,622,544	1,642,667	-20,123	-1%
	2011	28,600	27,756	844	3%	16,471	12,065	4,406	37%	1,470,612	1,433,555	37,057	3%
	2012	28,973	29,887	-914	-3%	15,997	13,900	2,097	15%	1,367,723	1,372,754	-5,031	0%
	2013	27,926	28,739	-813	-3%	12,890	13,668	-778	-6%	1,394,339	1,396,200	-1,862	0%
	2014	26,657				13,183				1,217,665			
Austria	2008	13,162	12,660	502	4%	4,648	5,321	-673	-13%	302,307	315,995	-13,688	-4%
	2009	12,942	12,134	808	7%	3,844	4,284	-440	-10%	296,735	316,162	-19,428	-6%
	2010	13,378	12,534	844	7%	4,930	5,033	-103	-2%	328,372	347,395	-19,023	-5%
	2011	12,995	11,712	1,283	11%	4,786	5,157	-371	-7%	308,406	327,957	-19,551	-6%
	2012	12,706	11,442	1,264	11%	4,018	4,826	-808	-17%	307,210	310,433	-3,223	-1%
	2013	12,262	11,680	582	5%	4,449	4,877	-428	-9%	290,772	293,566	-2,794	-1%
	2014	11,353				4,563				267,122			

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%
Poland	2008	20,328	24,479	-4,151	-17%	140,511	136,174	4,337	3%	541,589	525,307	16,282	3%
	2009	23,272	23,715	-443	-2%	129,570	128,218	1,352	1%	512,955	513,992	-1,037	0%
	2010	24,351	25,212	-861	-3%	129,522	129,697	-175	0%	535,396	536,108	-713	0%
	2011	25,177	24,916	261	1%	142,424	140,280	2,144	2%	535,915	537,435	-1,520	0%
	2012	23,329	23,773	-444	-2%	134,291	133,593	698	1%	569,380	569,447	-67	0%
	2013	21,781	21,593	188	1%	137,563	137,827	-264	0%	574,372	574,674	-302	0%
	2014	21,377				129,964				562,338			
Portugal	2008	12,942	12,552	390	3%	4,200	4,164	36	1%	172,983	174,055	-1,072	-1%
	2009	11,854	11,688	166	1%	4,747	4,674	73	2%	175,348	177,241	-1,893	-1%
	2010	11,740	11,088	652	6%	2,442	2,710	-268	-10%	139,263	188,691	-49,428	-26%
	2011	10,840	10,184	656	6%	3,700	3,635	65	2%	186,444	188,080	-1,636	-1%
	2012	9,457	9,158	299	3%	4,874	4,846	28	1%	168,567	165,391	3,176	2%
	2013	10,569	9,341	1,228	13%	4,450	4,410	40	1%	162,206	157,799	4,407	3%
	2014	9,725				4,519				149,900			
Romania	2008	10,090	11,746	-1,656	-14%	38,719	37,491	1,228	3%	503,913	522,367	-18,455	-4%
	2009	8,141	9,340	-1,199	-13%	32,091	32,013	78	0%	436,497	445,570	-9,073	-2%
	2010	8,394	8,147	247	3%	32,815	32,569	246	1%	462,542	451,681	10,861	2%
	2011	8,871	8,433	438	5%	38,269	38,944	-675	-2%	477,898	464,946	12,952	3%
	2012	8,519	8,615	-96	-1%	35,757	35,866	-109	0%	465,882	452,715	13,167	3%
	2013	8,094	8,139	-45	-1%	25,754	26,663	-909	-3%	430,846	410,052	20,794	5%
	2014	8,188				25,840				404,690			
Slovenia	2008	2,857	2,801	56	2%	4,887	5,236	-349	-7%	34,962	36,771	-1,809	-5%
	2009	2,472	2,548	-76	-3%	4,755	4,960	-205	-4%	33,599	34,748	-1,149	-3%
	2010	2,529	2,491	38	2%	4,928	4,955	-27	-1%	34,594	36,146	-1,552	-4%
	2011	2,533	2,492	41	2%	4,952	5,057	-105	-2%	28,765	30,907	-2,142	-7%
	2012	2,465	2,469	-4	0%	4,882	4,985	-103	-2%	27,091	29,742	-2,651	-9%
	2013	2,169	2,330	-161	-7%	4,045	4,487	-442	-10%	28,954	28,967	-13	0%
	2014	2,188				3,163				26,241			
Slovakia	2008	3,490	3,555	-65	-2%	8,613	8,170	443	5%	195,151	216,238	-21,087	-10%
	2009	3,342	3,236	106	3%	7,806	7,781	25	0%	223,225	185,657	37,568	20%
	2010	3,410	3,411	-1	0%	6,871	7,286	-415	-6%	212,203	209,806	2,398	1%
	2011	3,311	3,337	-26	-1%	7,557	7,487	70	1%	237,008	193,672	43,336	22%
	2012	3,062	3,203	-141	-4%	7,029	7,042	-13	0%	225,478	182,788	42,690	23%
	2013	2,977	3,134	-157	-5%	6,657	6,847	-190	-3%	203,223	201,628	1,595	1%
	2014	2,869				6,522				133,253			

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%	Cumulated Monthly	CRF 1.A.(b)	Difference absolute	%
Finland	2008	9,987	9,244	743	8%	11,875	13,634	-1,759	-13%	166,348	161,670	4,678	3%
	2009	9,292	8,770	522	6%	12,239	12,984	-745	-6%	145,871	145,708	163	0%
	2010	9,344	8,900	444	5%	16,186	16,817	-631	-4%	149,836	160,342	-10,507	-7%
	2011	8,755	8,905	-150	-2%	13,841	14,331	-490	-3%	140,148	140,518	-370	0%
	2012	8,046	7,705	341	4%	11,593	11,241	352	3%	125,385	125,848	-462	0%
	2013	7,196	7,647	-451	-6%	11,337	11,719	-382	-3%	118,526	119,622	-1,096	-1%
	2014	8,196				10,755				104,086			
Sweden	2008	13,006	13,113	-107	-1%	4,174	3,719	455	12%	34,564	34,198	365	1%
	2009	11,595	12,445	-850	-7%	2,844	3,227	-383	-12%	46,529	45,616	913	2%
	2010	13,600	12,968	632	5%	4,637	4,047	590	15%	106,010	61,345	44,665	73%
	2011	13,204	12,751	453	4%	4,133	3,842	291	8%	48,214	48,523	-309	-1%
	2012	12,262	11,884	378	3%	3,131	3,815	-684	-18%	42,098	42,356	-258	-1%
	2013	11,558	12,178	-620	-5%	3,252	3,669	-417	-11%	40,068	39,996	72	0%
	2014	11,471				3,398				33,245			
United Kingdom	2008	74,353	64,886	9,467	15%	58,214	55,613	2,601	5%	3,626,832	3,536,725	90,108	3%
	2009	77,320	60,753	16,567	27%	48,685	42,257	6,428	15%	3,215,405	3,267,060	-51,655	-2%
	2010	73,331	60,727	12,604	21%	50,285	50,854	-569	-1%	3,525,830	3,542,785	-16,955	0%
	2011	69,116	58,829	10,287	17%	50,109	50,543	-433	-1%	2,934,731	2,931,555	3,176	0%
	2012	67,485	56,871	10,615	19%	63,554	63,965	-411	-1%	2,773,037	2,772,837	200	0%
	2013	65,912	56,009	9,903	18%	61,027	61,270	-244	0%	2,747,482	2,756,655	-9,173	0%
	2014	55,419				48,781				2,511,757			
EU 15	2008	536,047	529,480	6,567	1%	487,272	493,400	-6,128	-1%	16,071,406	15,961,572	109,834	1%
	2009	517,558	501,379	16,180	3%	441,506	444,727	-3,221	-1%	15,087,507	15,101,507	-13,999	0%
	2010	505,289	495,564	9,726	2%	429,518	456,023	-26,505	-6%	16,294,551	16,248,810	45,741	0%
	2011	487,304	476,306	10,998	2%	461,965	468,594	-6,629	-1%	14,350,316	14,396,219	-45,903	0%
	2012	467,941	456,929	11,012	2%	492,339	500,350	-8,011	-2%	13,712,916	14,220,365	-507,449	-4%
	2013	454,153	447,179	6,974	2%	466,038	480,510	-14,472	-3%	13,968,491	14,145,004	-176,512	-1%
	2014	435,865				441,252				12,439,362			
EU 28	2008	601,670	599,435	2,235	0%	796,234	796,484	-250	0%	18,414,556	18,315,892	98,664	1%
	2009	582,149	567,173	14,976	3%	723,696	722,544	1,152	0%	17,205,208	17,200,953	4,255	0%
	2010	569,390	561,083	8,306	1%	715,834	745,234	-29,400	-4%	18,503,345	18,493,044	10,301	0%
	2011	555,752	544,209	11,543	2%	780,686	786,479	-5,793	-1%	16,702,279	16,705,124	-2,845	0%
	2012	533,437	523,110	10,327	2%	790,930	798,121	-7,191	-1%	16,009,333	16,478,331	-468,998	-3%
	2013	515,699	509,118	6,581	1%	750,503	767,098	-16,595	-2%	16,163,517	16,334,109	-170,593	-1%
	2014	498,029				718,286				14,441,507			

Source: Extraction Eurostat database and GHG inventory submission to UNFCCC in the specific year

Table 5-5: Differences between GHG inventory data and Eurostat annual energy data in apparent fuel consumption

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%
Belgium	2008	23,216	23,551	-335	-1%	6,813	6,812	1	0%	621,244	622,938	-1,695	0%
	2009	23,329	23,033	296	1%	4,716	4,869	-153	-3%	632,699	634,426	-1,727	0%
	2010	24,632	24,049	583	2%	5,005	5,059	-54	-1%	710,075	712,012	-1,937	0%
	2011	21,750	21,975	-225	-1%	4,603	4,589	14	0%	636,087	640,285	-4,198	-1%
	2012	20,532	20,548	-16	0%	4,586	4,542	44	1%	601,475	601,475	0	0%
	2013	21,502	21,965	-463	-2%	4,970	4,917	53	1%	602,704	602,704	0	0%
Bulgaria	2008	4,606	4,580	26	1%	32,927	32,666	261	1%	122,012	121,353	660	1%
	2009	4,152	4,161	-9	0%	30,147	28,562	1,585	6%	90,465	90,465	0	0%
	2010	3,789	3,810	-21	-1%	32,691	32,691	0	0%	93,838	96,312	-2,474	-3%
	2011	3,592	3,580	12	0%	40,208	40,208	0	0%	110,124	110,172	-48	0%
	2012	3,840	3,797	43	1%	35,273	35,273	0	0%	102,625	102,637	-12	0%
	2013	3,486	3,473	13	0%	30,585	30,585	0	0%	99,977	99,977	0	0%
Czech Republic	2008	9,266	9,105	161	2%	54,532	53,993	539	1%	298,119	298,119	0	0%
	2009	8,920	8,821	99	1%	51,136	50,791	345	1%	281,624	281,624	0	0%
	2010	8,841	8,714	127	1%	51,949	51,687	262	1%	335,723	336,360	-636	0%
	2011	8,445	8,171	274	3%	52,657	53,042	-385	-1%	283,607	283,607	0	0%
	2012	8,288	8,269	19	0%	49,222	50,486	-1,264	-3%	287,051	287,051	0	0%
	2013	8,010	7,955	55	1%	46,243	47,051	-808	-2%	290,832	291,435	-602	0%
Denmark	2008	7,208	7,122	86	1%	6,872	6,875	-3	0%	170,741	170,740	1	0%
	2009	6,950	6,549	401	6%	6,808	6,810	-2	0%	163,437	163,436	1	0%
	2010	5,977	6,844	-867	-13%	6,521	6,467	54	1%	185,203	185,204	-1	0%
	2011	6,422	6,601	-179	-3%	5,546	5,489	57	1%	155,640	155,640	0	0%
	2012	6,182	6,032	150	2%	4,271	4,271	0	0%	145,886	145,885	1	0%
	2013	5,950	5,930	20	0%	5,364	5,479	-115	-2%	138,833	138,833	0	0%
Germany	2008	107,391	103,866	3,525	3%	242,011	241,561	450	0%	3,205,279	3,069,942	135,337	4%
	2009	101,487	98,819	2,668	3%	224,048	224,909	-861	0%	3,206,219	2,944,253	261,966	9%
	2010	102,206	101,490	716	1%	231,059	233,063	-2,004	-1%	3,073,352	3,074,942	-1,589	0%
	2011	98,928	98,460	468	0%	236,753	237,524	-771	0%	2,756,188	2,784,786	-28,598	-1%
	2012	98,215	99,143	-928	-1%	247,526	247,727	-201	0%	2,923,196	2,966,298	-43,103	-1%
	2013	99,737	100,479	-742	-1%	247,279	246,447	832	0%	3,051,546	3,178,642	-127,096	-4%

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%
Estonia	2008	617	112	505	452%	16,046	15,997	49	0%	32,260	27,438	4,821	18%
	2009	453	431	22	5%	14,066	13,996	70	1%	21,986	21,398	588	3%
	2010	460	489	-29	-6%	18,207	18,207	0	0%	23,551	23,547	5	0%
	2011	462	467	-5	-1%	19,023	19,026	-3	0%	21,072	21,235	-164	-1%
	2012	495	460	35	8%	17,822	17,835	-13	0%	22,835	22,109	726	3%
	2013	420	413	7	2%	20,770	20,770	0	0%	23,233	23,083	149	1%
Ireland	2008	7,406	8,119	-713	-9%	6,470	5,856	614	10%	187,666	188,044	-378	0%
	2009	7,018	8,552	-1,534	-18%	6,177	6,168	9	0%	179,356	180,410	-1,054	-1%
	2010	6,831	6,723	108	2%	5,965	6,003	-38	-1%	196,608	197,170	-563	0%
	2011	6,019	6,152	-133	-2%	5,837	5,837	0	0%	172,361	172,744	-383	0%
	2012	5,859	5,462	397	7%	6,618	6,197	421	7%	168,076	168,449	-374	0%
	2013	5,946	5,762	184	3%	5,890	6,043	-153	-3%	161,940	162,109	-170	0%
Greece	2008	16,667	16,719	-52	0%	65,156	65,157	-1	0%	146,795	142,441	4,355	3%
	2009	15,942	16,678	-736	-4%	65,551	65,405	146	0%	124,388	121,786	2,603	2%
	2010	14,226	14,521	-295	-2%	58,319	57,961	358	1%	135,398	134,493	905	1%
	2011	12,571	13,559	-988	-7%	60,358	60,359	-1	0%	166,310	163,053	3,257	2%
	2012	12,501	11,713	788	7%	62,261	62,263	-2	0%	153,325	150,030	3,295	2%
	2013	10,664	10,687	-23	0%	54,688	54,688	0	0%	135,497	135,497	0	0%
Spain	2008	64,388	64,388	0	0%	25,903	25,903	0	0%	1,461,599	1,461,599	0	0%
	2009	59,786	59,786	0	0%	19,571	19,493	78	0%	1,309,163	1,312,073	-2,909	0%
	2010	57,309	56,306	1,003	2%	14,451	14,451	0	0%	1,305,770	1,305,770	0	0%
	2011	54,007	53,042	965	2%	23,926	23,926	0	0%	1,213,828	1,213,828	0	0%
	2012	49,043	48,435	608	1%	28,693	28,693	0	0%	1,180,239	1,181,551	-1,311	0%
	2013	46,305	45,467	838	2%	20,633	20,633	0	0%	1,092,028	1,093,235	-1,207	0%
France	2008	83,231	85,715	-2,484	-3%	19,315	21,636	-2,321	-11%	1,669,912	1,674,708	-4,796	0%
	2009	81,024	79,528	1,496	2%	17,287	18,049	-762	-4%	1,610,319	1,607,340	2,979	0%
	2010	76,266	79,203	-2,937	-4%	18,162	19,859	-1,697	-9%	1,781,056	1,798,429	-17,373	-1%
	2011	75,648	78,604	-2,956	-4%	15,596	17,375	-1,779	-10%	1,550,868	1,482,516	68,352	5%
	2012	73,110	77,070	-3,960	-5%	17,342	19,473	-2,131	-11%	1,600,211	1,605,645	-5,434	0%
	2013	70,701	73,018	-2,317	-3%	18,824	21,317	-2,493	-12%	1,633,145	1,629,936	3,209	0%

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%
Croatia	2008												
	2009												
	2010												
	2011	3,403	3,522	-119	-3%	1,225	1,224	1	0%	119,567	107,610	11,957	11%
	2012	3,178	3,167	11	0%	1,080	1,081	-1	0%	101,038	101,781	-743	-1%
	2013	3,017	3,073	-56	-2%	1,139	1,138	1	0%	95,537	95,537	0	0%
Italy	2008	72,769	76,214	-3,445	-5%	24,679	24,083	596	2%	2,910,639	2,908,665	1,973	0%
	2009	67,598	72,318	-4,720	-7%	19,681	19,398	283	1%	2,675,445	2,673,630	1,815	0%
	2010	65,434	68,672	-3,238	-5%	21,595	21,333	262	1%	2,849,396	2,847,466	1,930	0%
	2011	62,955	65,270	-2,315	-4%	24,172	23,824	348	1%	2,671,770	2,669,961	1,809	0%
	2012	55,917	59,176	-3,259	-6%	24,950	24,500	450	2%	2,568,837	2,567,407	1,429	0%
	2013	53,455	55,913	-2,458	-4%	21,632	21,292	340	2%	2,402,667	2,402,951	-284	0%
Cyprus	2008	2,520	2,365	155	7%	41	42	-1	-1%				
	2009	2,457	2,349	108	5%	22	21	1	4%				
	2010	2,395	2,370	25	1%	27	26	1	4%				
	2011	2,294	2,294	0	0%	13	12	1	8%				
	2012	2,169	2,135	34	2%	1	1	0	0%				
	2013	1,837	1,830	7	0%	1	13	-12	-92%				
Latvia	2008	1,414	1,420	-6	0%	176	176	0	0%	55,814	55,894	-81	0%
	2009	1,172	1,174	-2	0%	138	135	3	2%	51,380	51,493	-113	0%
	2010	1,080	1,115	-35	-3%	180	170	10	6%	61,206	61,313	-107	0%
	2011	1,103	1,089	14	1%	194	180	14	8%	53,943	53,998	-55	0%
	2012	1,265	1,226	39	3%	148	148	0	0%	50,709	50,812	-104	0%
	2013	1,254	1,192	62	5%	131	131	0	0%	50,438	50,544	-106	0%
Lithuania	2008	2,774	2,809	-35	-1%	385	351	34	10%	108,674	108,673	1	0%
	2009	2,301	2,429	-128	-5%	291	267	24	9%	91,327	91,329	-2	0%
	2010	2,297	2,494	-197	-8%	358	331	27	8%	104,321	82,007	22,314	27%
	2011	2,171	2,372	-201	-8%	447	440	7	2%	113,799	113,817	-18	0%
	2012	2,261	2,425	-164	-7%	442	426	16	4%	111,119	111,132	-13	0%
	2013	2,180	2,372	-192	-8%	444	427	17	4%	90,624	90,608	16	0%

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%
Luxembourg	2008	2,443	2,484	-41	-2%	124	105	19	18%	45,771	45,744	27	0%
	2009	2,267	2,310	-43	-2%	113	113	0	0%	46,577	46,577	0	0%
	2010	2,384	2,390	-6	0%	113	113	0	0%	50,099	50,099	0	0%
	2011	2,536	2,506	30	1%	99	99	0	0%	43,219	43,219	0	0%
	2012	2,495	2,404	91	4%	92	92	0	0%	44,006	44,005	0	0%
	2013	2,433	2,363	70	3%	80	81	-1	-1%	37,258	37,258	0	0%
Hungary	2008	6,938	6,983	-45	-1%	11,521	12,789	-1,268	-10%	442,161	442,161	0	0%
	2009	6,847	6,789	58	1%	10,542	11,073	-531	-5%	383,171	383,171	0	0%
	2010	6,410	6,449	-39	-1%	10,676	11,592	-916	-8%	410,955	410,955	0	0%
	2011	6,056	6,413	-357	-6%	11,263	11,983	-720	-6%	391,631	391,506	124	0%
	2012	5,726	5,779	-53	-1%	11,057	11,034	23	0%	347,753	347,753	0	0%
	2013	5,520	5,662	-142	-3%	10,683	10,648	35	0%	322,601	322,601	0	0%
Malta	2008	836	0	836									
	2009	745	802	-57	-7%								
	2010	845	817	28	3%								
	2011	1,099	817	282	34%								
	2012	772	864	-92	-11%								
	2013	733	773	-40	-5%								
Netherlands	2008	29,404	28,845	559	2%	12,888	12,960	-72	-1%	1,450,976	1,454,108	-3,132	0%
	2009	28,771	28,017	754	3%	12,018	12,086	-68	-1%	1,464,133	1,465,789	-1,656	0%
	2010	29,424	29,149	275	1%	12,117	12,253	-136	-1%	1,641,493	1,642,667	-1,174	0%
	2011	28,518	27,756	762	3%	11,939	12,065	-126	-1%	1,432,013	1,433,555	-1,542	0%
	2012	29,486	29,887	-401	-1%	13,143	13,900	-757	-5%	1,372,878	1,372,754	124	0%
	2013	28,115	28,739	-624	-2%	13,080	13,668	-588	-4%	1,383,983	1,396,200	-12,217	-1%
Austria	2008	12,549	12,660	-111	-1%	5,457	5,321	136	3%	312,835	315,995	-3,160	-1%
	2009	11,981	12,134	-153	-1%	4,273	4,284	-11	0%	300,038	316,162	-16,125	-5%
	2010	12,068	12,534	-466	-4%	5,015	5,033	-18	0%	343,922	347,395	-3,474	-1%
	2011	11,588	11,712	-124	-1%	5,165	5,157	8	0%	324,678	327,957	-3,279	-1%
	2012	11,483	11,442	41	0%	4,825	4,826	-1	0%	310,433	310,433	1	0%
	2013	11,680	11,680	0	0%	4,911	4,877	34	1%	293,567	293,566	1	0%

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%
Poland	2008	23,894	24,479	-585	-2%	134,794	136,174	-1,380	-1%	525,307	525,307	0	0%
	2009	23,531	23,715	-184	-1%	127,528	128,218	-690	-1%	502,567	513,992	-11,425	-2%
	2010	24,715	25,212	-497	-2%	133,746	129,697	4,049	3%	536,108	536,108	0	0%
	2011	24,876	24,916	-40	0%	138,699	140,280	-1,581	-1%	537,434	537,435	-1	0%
	2012	23,762	23,773	-11	0%	132,657	133,593	-936	-1%	569,447	569,447	0	0%
	2013	21,548	21,593	-45	0%	137,505	137,827	-322	0%	574,674	574,674	0	0%
Portugal	2008	12,313	12,552	-239	-2%	4,160	4,164	-4	0%	173,272	174,055	-783	0%
	2009	11,467	11,688	-221	-2%	4,680	4,674	6	0%	176,567	177,241	-675	0%
	2010	11,170	11,088	82	1%	2,705	2,710	-5	0%	187,935	188,691	-756	0%
	2011	10,528	10,184	344	3%	3,700	3,635	65	2%	186,884	188,080	-1,196	-1%
	2012	8,911	9,158	-247	-3%	4,874	4,846	28	1%	164,651	165,391	-740	0%
	2013	9,224	9,341	-117	-1%	4,449	4,410	39	1%	157,251	157,799	-549	0%
Romania	2008	9,980	11,746	-1,766	-15%	40,384	37,491	2,893	8%	521,348	522,367	-1,020	0%
	2009	8,463	9,340	-877	-9%	35,136	32,013	3,123	10%	443,775	445,570	-1,795	0%
	2010	8,807	8,147	660	8%	32,649	32,569	80	0%	451,681	451,681	0	0%
	2011	8,675	8,433	242	3%	39,010	38,944	66	0%	464,946	464,946	0	0%
	2012	8,487	8,615	-128	-1%	35,870	35,866	4	0%	452,715	452,715	0	0%
	2013	7,987	8,139	-152	-2%	26,669	26,663	6	0%	410,052	410,052	0	0%
Slovenia	2008	2,916	2,801	115	4%	5,236	5,236	0	0%	36,789	36,771	19	0%
	2009	2,528	2,548	-20	-1%	4,972	4,960	12	0%	34,815	34,748	67	0%
	2010	2,514	2,491	23	1%	4,955	4,955	0	0%	36,125	36,146	-21	0%
	2011	2,552	2,492	60	2%	5,064	5,057	7	0%	30,883	30,907	-24	0%
	2012	2,503	2,469	34	1%	4,985	4,985	0	0%	29,730	29,742	-12	0%
	2013	2,398	2,330	68	3%	4,487	4,487	0	0%	28,967	28,967	0	0%
Slovakia	2008	3,493	3,555	-62	-2%	8,098	8,170	-72	-1%	216,303	216,238	65	0%
	2009	3,192	3,236	-44	-1%	7,715	7,781	-66	-1%	185,238	185,657	-419	0%
	2010	3,372	3,411	-39	-1%	7,609	7,286	323	4%	209,609	209,806	-197	0%
	2011	3,306	3,337	-31	-1%	7,415	7,487	-72	-1%	194,144	193,672	472	0%
	2012	3,135	3,203	-68	-2%	6,982	7,042	-60	-1%	182,768	182,788	-20	0%
	2013	3,048	3,134	-86	-3%	6,847	6,847	0	0%	201,571	201,628	-57	0%

Member States		Liquid fuels (kt)				Solid fuels (kt)				Gaseous fuels (TJ)			
		Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%	Annual	CRF 1.A.(b)	Difference absolute	%
Finland	2008	9,576	9,244	332	4%	12,995	13,634	-639	-5%	161,316	161,670	-354	0%
	2009	9,129	8,770	359	4%	12,761	12,984	-223	-2%	145,872	145,708	164	0%
	2010	8,426	8,900	-474	-5%	16,750	16,817	-67	0%	160,668	160,342	326	0%
	2011	9,054	8,905	149	2%	14,206	14,331	-125	-1%	140,674	140,518	156	0%
	2012	7,887	7,705	182	2%	11,336	11,241	95	1%	125,819	125,848	-28	0%
	2013	7,187	7,647	-460	-6%	11,507	11,719	-212	-2%	119,611	119,622	-11	0%
Sweden	2008	13,205	13,113	92	1%	4,204	3,719	485	13%	34,605	34,198	407	1%
	2009	11,546	12,445	-899	-7%	3,423	3,227	196	6%	50,938	45,616	5,322	12%
	2010	13,353	12,968	385	3%	4,248	4,047	201	5%	54,969	61,345	-6,375	-10%
	2011	13,541	12,751	790	6%	4,239	3,842	397	10%	48,287	48,523	-236	0%
	2012	12,341	11,884	457	4%	3,659	3,815	-156	-4%	42,144	42,356	-212	0%
	2013	11,404	12,178	-774	-6%	3,669	3,669	0	0%	39,996	39,996	0	0%
United Kingdom	2008	64,707	64,886	-179	0%	58,503	55,613	2,890	5%	3,536,479	3,536,725	-246	0%
	2009	61,626	60,753	873	1%	48,319	42,257	6,062	14%	3,270,733	3,267,060	3,673	0%
	2010	60,661	60,727	-66	0%	50,230	50,854	-624	-1%	3,550,973	3,542,785	8,188	0%
	2011	58,510	58,829	-319	-1%	49,797	50,543	-746	-1%	2,939,218	2,931,555	7,663	0%
	2012	55,995	56,871	-876	-2%	63,316	63,965	-649	-1%	2,777,984	2,772,837	5,147	0%
	2013	55,371	56,009	-638	-1%	60,778	61,270	-492	-1%	2,750,037	2,756,655	-6,618	0%
EU 15	2008	526,473	529,480	-3,007	-1%	495,550	493,400	2,150	0%	16,089,129	15,961,572	127,557	1%
	2009	499,921	501,379	-1,458	0%	449,426	444,727	4,699	1%	15,355,883	15,101,507	254,376	2%
	2010	490,367	495,564	-5,197	-1%	452,255	456,023	-3,768	-1%	16,226,916	16,248,810	-21,894	0%
	2011	472,575	476,306	-3,731	-1%	465,936	468,594	-2,658	-1%	14,438,024	14,396,219	41,805	0%
	2012	449,957	456,929	-6,972	-2%	497,492	500,350	-2,858	-1%	14,179,161	14,220,365	-41,204	0%
	2013	439,674	447,179	-7,505	-2%	477,754	480,510	-2,756	-1%	14,000,062	14,145,004	-144,942	-1%
EU 28	2008	595,727	599,435	3,708	1%	799,690	796,484	-3,206	0%	18,447,915	18,315,892	-132,022	-1%
	2009	564,682	567,173	2,491	0%	731,119	722,544	-8,575	-1%	17,442,230	17,200,953	-241,277	-1%
	2010	555,892	561,083	5,191	1%	745,302	745,234	-68	0%	18,490,035	18,493,044	3,009	0%
	2011	540,609	544,209	3,600	1%	781,154	786,479	5,325	1%	16,759,174	16,705,124	-54,050	0%
	2012	515,838	523,110	7,272	1%	793,031	798,121	5,090	1%	16,436,950	16,478,331	41,381	0%
	2013	501,112	509,118	8,006	2%	763,258	767,098	3,840	1%	16,188,567	16,334,109	145,542	1%

Source: Extraction Eurostat database and GHG inventory submission to UNFCCC in the specific year