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**VOLUNTARY AGREEMENTS IN THE FIELD OF ENERGY EFFICIENCY
AND EMISSION REDUCTION: REVIEW AND ANALYSIS OF THE
EXPERIENCE IN MEMBER STATES OF THE EUROPEAN UNION**

**Report prepared by the Joint Research Centre of the European
Commission**

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1. Introduction

Voluntary agreements are tailor-made negotiated covenants between the public authorities and individual firms or groups of firms, which include targets and timetables for action aimed at improving energy efficiency or reducing GHG emissions and define rewards and penalties. VAs differ with respect to their form, legal status, structures and provisions, parties and enforceability. The International Energy Agency defines a VA as “a contract between the government and industry, or negotiated targets with commitments and time schedules on the part of all participating parties” [1].

In this report the broad term voluntary agreement (VA) is used to denote policy portfolios that cover at least the following elements¹:

- Binding nature of agreements once a party joins;
- Quantitative targets (energy efficiency improvement, energy savings, carbon reductions) and/or commitments on the side of signatories to implement significant actions over a reasonable timescale;
- Reporting provisions, monitoring of compliance and evaluation of results,
- Accompanying measures on the side of public authorities (e.g. tax rebates, information, financial incentives, etc.)

The first point deserves special attention: even though parties decide voluntarily whether to join an agreement or not, once they have acceded they are under an obligation to comply with the rules and requirements of the agreement, possibly facing some sort of penalty or sanction in case of non-compliance.

The report reviews the current experience and pending plans of EU Member States with VAs on energy efficiency in all end-use sectors, and draws conclusions on their effectiveness and flexibility. The report points to success factors and barriers in the design and implementation of VAs, **drawing conclusions from the most advanced VAs in place about the guiding principles of an optimal operational framework of VAs.**

The structure of the report is as follows:

- Sections 2 to 6 look at specific design elements of existing VAs, such as general framework, targets and sectors, obligations and commitments, motivation to join, as well as reporting and monitoring provisions. Section 7 provides an overview of the administrative costs involved in implementing VAs, while section 8 presents the results of existing VAs as reported by national authorities;
- Section 9 summarises the key characteristics of voluntary agreements, success factors and barriers, while section 10 gives recommendations for the application of this policy tool;
- Annex I includes detailed country files of all VAs discussed in the report, as well as country files of MS that had VAs (but no longer have them, e.g. France), have similar voluntary arrangements (e.g. Austria and Italy) and/or have pilot project VAs (Bulgaria, Romania and Greece). While the focus of the report is on national VAs, in Annex I we include short references to three EU-wide programs of a voluntary nature (GreenLight, Green Building and Motor Challenge Program) due to their important

¹ Other voluntary programmes, which do not entirely fit in the above definition, include generic environmental declarations and other unilateral commitments by industry. This report does not discuss entirely voluntary measures and declarations – such as klima:aktiv in Austria – as they do not fit with the framework for VAs outlined above. Yet these are briefly outlined in Annex I (Austria, Italy and European programs).

role in promoting VAs in some MS, as well as to the appliance manufacturers' commitments at European level.

The voluntary agreements analysed focus on energy efficiency or climate change objectives and cover the following MS (see Table 1). MS that have VAs at pilot project phase are not covered in the analysis due to the uncertainty related to sustaining this policy beyond the pilot project phase.

In addition, there are voluntary agreements between the central authorities and local or regional authorities. Finland and the Netherlands offer notable examples with EE-related VAs with the public sector: for instance in its Municipal Sector Agreements, Finland has transposed numerous ESD provisions, including but not limited to the ones relevant to the public sector (see the country file of Finland in Annex I). In addition, in the UK there is a set of targets and agreements with the devolved administrations concerning e.g. carbon neutrality of Government estate, emission reductions in administrative estate, and energy use in Government buildings. These are not covered in the present report because they do not meet the pre-requisites for VAs.

Table 1. Voluntary agreements in the EU: scope of the report

	Coverage	Comment
AT	N	Klima:aktiv is not a system of agreements, but an umbrella for voluntary programs. Previous pilot project discontinued with the ETS.
BE	Y	Flanders and Walloon
BG	N	pilot project
CY	N	No VA
CZ	N	No VA
DK	Y	
EE	Y	Environmental VA with indirect EE impact for emitters.
FI	Y	
FR	N	No VA (AERES expired and not continued with the ETS)
DE	Y	
GR	N	pilot project
HU	N	No VA, but indicated in the 1 st NEEAP
IE	Y	
IT	N	voluntary statement
LV	N	No VA
LT	N	No VA
LU	N	No VA
MT	N	No VA
NL	Y	
PL	N	No VA, but indicated in the 1 st NEEAP and a pilot considered
PT	N	No VA, but indicated in the 1 st NEEAP
RO	N	pilot project

SK		
SI	Y	
ES	N	No VA, but indicated in the 1 st NEEAP
SE	Y	
UK	Y	

2. General framework

In the environmental field VAs date back to the mid-90s. In the field of energy efficiency, however, only a handful of MS have solid experience with implementing national VAs for more than 10 years, most notably Denmark, Finland and the Netherlands.

At present, the large majority of VAs across the EU have been focussed on industrial process energy consumption (e.g. Belgium, Denmark, Estonia, Ireland, Sweden and Slovenia). Yet, beyond large industrial energy users, this instrument is increasingly applied with respect to medium-size industrial energy users, the service sector and, most recently, transport. Finland and the Netherlands place a strong focus on VAs as a preferred policy for an increasing number of sectors beyond industry.

The best established VAs in the EU – in Denmark, Finland, the Netherlands, Sweden, the UK – have been introduced well before Directive 2006/32/EC entered in force reflecting national energy and climate policy goals. These MS – along with others with newer VAs, such as Ireland – generally tend to make reference to their VAs in the 1st NEEAP, often pointing to the existing VAs as a major measure in the industrial sector.

A notable example is Finland, where all major provisions of the ESD have been incorporated into its new set of VAs, introduced for the period 2008-2016. Some MS have introduced VAs with implicit or explicit reference to Directive 2003/96/EC on minimum taxation of electricity (e.g. Sweden).

Another group of MS have indicated in their 1st NEEAPs that they intend to use VAs in order to achieve their national targets, but have not implemented any VAs as of January 2010 (Hungary, Poland, Portugal and Spain). Bulgaria, Romania and Greece have pilot project VAs in place.

3. Target sectors and actors

In the late 90s VAs have been exclusively targeted at industrial sectors. At present, the large majority of agreements remains focussed on **industry**, primarily large energy users and/or energy intensive branches, though an increasing number of MS place a focus on VAs as a tool in non-energy intensive industry. Some VAs that target energy intensive industry exclusively have a minimum threshold of energy consumption to allow companies to sign (e.g. the Benchmarking Covenant in Flanders), or require companies to meet other consumption characteristics (e.g. to have heavy processes in Denmark, to be engaged in manufacturing and be energy intensive in Sweden, to have energy account for at least a certain percentage of their production value in the UK), but often allow companies to also follow a criterion for share of energy taxes in their value added (Sweden and Denmark).

Most VAs in place are a combination of sectoral agreements and individual agreements, i.e. both individual companies and sectoral associations are allowed to enter into an agreement. Some VAs (e.g. Walloon, Germany, the UK) target industrial (sectoral) **associations** exclusively, while others allow both associations and individual companies or **individual signatories** alone, such as individual companies or municipalities, to enter into an

agreement (e.g. Denmark, Finland, Sweden, Estonia, Slovenia). In the first case national authorities in charge of the system have fewer counterparties, which may simplify some implementation aspects for implementing authorities, most notably compliance monitoring. In the VAs where the counterparties are industrial associations, individual company targets are set within the framework of branch targets and individual companies report to their respective associations; the associations bear the overall relation and responsibility for compliance with the branch target. Whereby VAs are signed with industrial association, the targets are set at branch (sectoral) level and individual targets are fixed within the branch; individual companies' targets allow locating non-compliance.

Most of the VAs target to cover a sizeable part of the energy consumption of the entire industrial branch – e.g. 80-90% of industrial energy use in the Flemish and Walloon regions in Belgium, 70% of industrial energy use in Germany, 60% of total energy use in trade and industry in Denmark, 50% of total industrial electricity use in Sweden – or at least significant share of the consumption of each branch covered (for instance, targets for branch associations to cover 60-90% of energy use in member companies in Finland).

In most countries **separate VAs** cover intensive and non-intensive industry (e.g. the Flemish and Walloon regions of Belgium, Finland, and the Netherlands). This trend is partially related to different ways in which MS have responded in order to not let VAs interfere with the EU ETS (see section 3.1).

VAs have also been introduced in end-use sectors other than industry, such as the **public** and **commercial** sector (Finland, the Netherlands), **agriculture** (the Netherlands and Finland from 2010), **transport** (Finland, the Netherlands, the UK). Finland and the Netherlands are the two MS with most comprehensive VA sectoral coverage, with the Netherlands covering important sectors such as construction and the housing rental sector.

Experience with VAs in the **energy sector** (energy market actors) is still limited and therefore not considered in this report because no sufficiently long track record exists to draw solid conclusions with most VAs in this sector introduced in 2008 and 2009. The transposition questionnaires distributed to MS in 2009 point to some developments in the scope of Article 6.2b of the ESD concerning voluntary agreements with energy market actors. Austria, Denmark, Finland, Italy, the Netherlands and the UK have VAs that entirely or partially fall in the scope of Article 6.2b. In Finland and Italy these target fuel distributors. In the Netherlands, Austria, Denmark², the UK the VAs have wider coverage of energy suppliers (or associations of these). Other MS – namely Bulgaria, the Czech Republic, Ireland, Lithuania and Romania have reported legislative developments in this respect. In addition, Estonia, Greece, Hungary and Latvia and have reported in this questionnaire the existence of VAs (Estonia) or intention to introduce VAs (Hungary and Latvia). In the case of Estonia these are VAs with industrial actors beyond the scope of Article 6.2b. In the case of Latvia the draft Law on Energy End-Use Efficiency provides the opportunity for sectoral associations, economic operators and local authorities to enter into agreements with the State with regard to the implementation of energy efficiency measures. In the case of Greece and Hungary industrial VAs are mentioned in the NEEAPs, but it is unclear if any implementation has followed.

3.1. VAs and the EU ETS

The introduction of the EU ETS has added additional complexity to VAs in terms of avoiding double counting between the VAs with the ETS whereby companies may benefit from a surplus arising from the same emission reduction in both schemes or, alternatively, be penalised in both schemes due to the same shortfall. MS have responded to this challenge

² The energy saving targets in Denmark have been established in the scope of VAs, see JRC report of supplier obligations and white certificates.

by either revising their VAs so as to not interfere with the ETS (see examples next), or gradually abandoning VAs (e.g. Austria and France).

- One example of accounting for interactions between the VAs and the ETS is to only cover electricity consumption in ETS installations (as in Sweden and Denmark).
- Another approach to avoid double counting, while targeting energy intensive industry is taken by the UK: a mechanism to net off the *EU ETS* surplus from the *VA performance*. The principle of the methodology is that EU ETS functions in the prescribed way, with the movement of allowances as required by the allocation for each installation. Double counting of allowances is prevented by correcting the CCA target. Finally, the CCA performance is compared with this corrected target.
- A third approach is to separate the EU ETS *emissions* from the *VA targets* (rather than from the VA performance, as in the UK). Following this approach, a number of MSs have introduced separate VAs for energy intensive (ETS) and non-energy intensive (mostly non-ETS) branches.

4. Obligations/commitments

This report considers only VAs that incorporate concrete quantitative targets (e.g. for energy efficiency improvement, energy savings, carbon reductions) and/or very specific commitments on the side of signatories to implement certain measures or undertake specific actions. Table 2 summarises the sectoral coverage (discussed in section 3), duration, targets and other commitments of the VAs in place in 9 MS.

Program participants (signatories) commit to the targets defined and obligations specified, such as:

- GHG reduction, energy efficiency improvement or a possibility to choose one of the two options, or
- Other targets (achieving best international standard in the Benchmarking Covenant in Flanders, adopting the energy management standard in the Energy Agreements Program in Ireland, etc.).

It has been observed that programs that rely strongly on energy tax exemptions or rebates may be less demanding in terms of setting quantitative targets. VAs that rely on taxation usually target energy intensive industry, where mandating energy management systems (EMS) and energy audits can have an extremely high impact (e.g. Denmark and Sweden), which however may be difficult to quantify in advance in order to establish realistic targets. On a similar line, in Ireland it is assumed that the proper design of an EMS, along with ensuring the right level of commitment to the EMS in terms of managerial, human and financial resources, assures the continued compliance with the EMS will deliver results without necessarily committing to targets. On the other hand, for example in the UK, Slovenia, Estonia and Germany tax or environmental charge rebates or exemptions are contingent upon meeting quantified targets.

Other important actions committed to by VA signatories include:

- Energy audits, screens, special investigations (both Belgian regions, Denmark, Finland, Ireland, the Netherlands, Sweden),
- Preparation of action plans and implementation of economically sound measures based on criteria such as PBT and IRR thresholds (under different conditions: both Belgian regions, Denmark, Finland, Sweden, the Netherlands);
- Energy management system (Denmark, Ireland, Sweden, the Netherlands);
- Procurement (Finland and Sweden);

- Benchmarking (Flemish region);
- Other (e.g. acquiring expertise on the use of ESCOs in Finland);
- Operational requirements (e.g. reporting – all, as an example in Finland municipalities have to monitor at least 90% of energy use in buildings by 2013).

This points to two approaches towards VAs:

- VAs that are very specific about the precise actions that signatories should undertake (e.g. Finland, Denmark, the Netherlands, Sweden),
- VAs that are more focussed on the targets and the lucrative role of tax rebates and not so specific about particular actions to be implemented in order to meet targets (e.g. Germany, Estonia, Slovenia and the UK).

Table 2. Voluntary agreements in the EU: sectors, commitments and duration

	TITLE OF THE PROGRAM(S)	DURATION	SECTORS COVERED						COMMITMENTS	
			INDUSTRY		PUBLIC	COMMER CIAL	TRANSPOR T	AGRICULT URE	TARGETS	OTHER ACTIONS
			ENERGY- INTENSIVE/LAR GE ENERGY USERS	NON-EN INTENSIVE/SMA LL AND MEDIUM ENERGY USERS						
BE- FL	Benchmarking covenant (BC), Auditing Covenant (AC)	BC: 2003- 2012, AC- 2005-2013	X (BC)	X (AC)	-	-	-	-	BIS by 2012 (BC)	EAP (BC), audits, EAP and implement IRR>15 (AC)
BE- W	LTA	2003-2010 (2012)	X	X	-	-	-	-	X	
DK	Voluntary agreements on energy efficiency	1996-	X	X ¹	-	X ¹	-	-	None	EMS, EA, special investigations , PBT<4/6y
FI	Energy Conservation Agreements (ECA - finished with the exception of housing property sector), Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries, Municipal Sector Agreement, Höylä III Energy Efficiency Agreement	1997-2007 (ECA), 2008-2016 (EEA)	X	X	X	X	X	X (new 2010)	9% (ESD model)	Various across the VAs
DE	Joint Declaration of the German Industry on Climate Protection	1995 (2000) - 2012 (2015)	X	X	-	-	-	-	X (mostly specific CO ₂ emissions)	None specific

	TITLE OF THE PROGRAM(S)	DURATION	SECTORS COVERED						COMMITMENTS	
			INDUSTRY		PUBLIC	COMMERCIAL	TRANSPORT	AGRICULTURE	TARGETS	OTHER ACTIONS
			ENERGY-INTENSIVE/LARGE ENERGY USERS	NON-ENERGY-INTENSIVE/SMALL AND MEDIUM ENERGY USERS						
EE	Substitution the pollution charge under the Environmental Charges Act with financing activities		X	X	-	-	-	-	Yes (partial) ²	None (apart from reporting)
IE	Energy Agreements Program	2006-	X (annual energy costs >1 million Euro)		-	X	-	-	None	I.S. EN16001 + 3 special investigations over 3 years
NL	LTA3 and LEE Corporation Sector Energy Conservation Agreement The "Spring Agreement" on energy conservation in new constructions	LTA3: 2001-2020 LEE: 1999-2020	X (LEE)	X (LTA3)	X ³	X ⁴	X ⁵	X ⁶	X (LTA3, for LEE in the EEPs)	LTA3:EEP,EMS; LEE:EEP
SI	CO ₂ tax and voluntary agreements	2005-2009, new program under design		X	-	-	-	-	X	None (apart from reporting)
SE	Program for Energy Efficiency in Energy Intensive Industries	2005-	X		-	-	-	-	Yes (partial) ⁷	
UK	Climate Change Agreements, Energy Efficiency Agreements with transport fuel suppliers	2001-	X	-	-	-	X	-	X (CCA)	

¹ Medium-size energy users as long as they are energy intensive. To be classified as energy intensive a company has to carry out one or more heavy processes identified on a "process list" or have a green tax liability of more than 4% of value added.

² The financing of activities shall substitute for the pollution charge if the polluter implements environmental protection measures which ensure the reduction of pollutants or waste over the course of three years by not less than 15% in comparison with the last accounting year of the period prior to the implementation of such measures.

³ LTA3 - municipalities

⁴LTA1 supermarkets, Corporation Sector Energy Conservation Agreement for rental housing and the "Spring Agreement" for new building construction

⁵LTA1 NL railway

⁶LTA-e+ for flower bulb and mushroom growers

⁷ In the 2-year-report the companies undertake for the program period. These measures become compulsory and add up to a sum, which is the target for the company. The participant is then urged to comment how this contributes to achieving the target. The law is written in a way somewhat open for interpretation. The participants have to achieve a level of measures that at least equals the effect that would have been if they instead paid the tax. By almost all this is interpreted as the percentage the tax is of the electricity price. Today, this means 1 %.

5. Motivation to join

On their part national authorities allow for different concessions, including one or more of the following:

- deferred legislation (regulation or taxation),
- easier access to environmental licenses,
- financial support to undertake certain actions, such as subsidies for energy audits or capital investment in energy efficiency,
- energy or carbon tax exemptions or reductions, and/or
- programs that involve government and public recognition, provision of information on energy-efficient technologies, government assistance and training in energy management.

Financial assistance and energy/carbon tax rebates have been the most common motivating factors for VA participants. The public image role of VAs is an important driver for companies to join, as are auxiliary programs related to provision of information and training.

Most of the VAs include some form of penalty mechanism or other threat of sanctions to discourage non-compliance with VA commitments. Whereby a financial stimulus of some sort is envisaged, then the most common threat is withdrawal of eligibility for the stimulus (e.g. subsidy or tax rebate), often combined with a requirement to retroactively pay back the financial aid already provided after the last compliance period or reporting (e.g. Denmark, Finland, Slovenia, Estonia). Germany has linked eligibility for electricity tax rebate to convincing progress against the 2012 targets; these targets however have been met still in 2008.

Table 3 summarises the main motivators and the mechanisms for discouraging non-compliance.

Table 3. Motivators and mechanisms for discouraging non-compliance

	TITLE OF THE PROGRAM(S)	MAIN MOTIVATOR	NON-COMPLIANCE PENALTY
BE-FL	Benchmarking covenant (BC), Auditing Covenant (AC)	deferred legislation (BC), energy tax rebates (AC)	
BE-W		deferred legislation, energy tax rebates	
DK	Voluntary agreements on energy efficiency	CO ₂ tax rebate	repayment of rebates
FI	Energy Conservation Agreements (ECA - finished with the exception of housing property sector), Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries, Municipal Sector Agreement, Höylä III	subsidies (EA, measure implementation)	repayment of subsidies

	Energy Efficiency Agreement		
DE	Joint Declaration of the German Industry on Climate Protection	electricity tax rebate	loss of rebate, but conditions for the rebate already met
EE	VAs for pollution charge substitution	pollution charge substitution	
IE	Energy Agreements Program	EN16001	none
NL	LTA3 and LEE	easier access to environmental permits	tightened environmental license (LTA3)
SI	CO₂ tax and voluntary agreements	CO₂ tax rebates	Repayment of tax credit
SE	Program for Energy Efficiency in Energy Intensive Industries	Electricity tax rebates	discontinuation of tax rebate and repayment of tax credit
UK	Climate Change Agreements (CCAs), Energy Efficiency Agreements with transport fuel suppliers	Climate change levy rebate (for CCAs)	discontinuation of tax rebate

6. Reporting provisions and monitoring

In order for a VA program to deliver real results, it needs an effective and credible system of monitoring of compliance and evaluation of results, ensuring transparency by making reporting public, at least at branch level. Monitoring is a procedure whereby program participants report on their energy consumption to the administrator or other body that is responsible for monitoring of compliance. Evaluation is a procedure whereby an independent body assesses the overall results and achievements of a VA in order to determine compliance and point to any improvements needed.

Adequate resource allocation – in terms of human and financial resources – are needed to ensure appropriate reporting, monitoring and evaluation. In this respect ideally an independent third-party verification party is involved – such as an agency trusted by the parties in the agreement (government and companies).

In some cases companies have to only report to their associations (e.g. Germany, Finland), while in the majority of cases companies report to the national authorities directly (e.g. the Netherlands, Sweden, Denmark, Estonia, Slovenia).

One of the major critiques to VAs is its strong reliance on self-reporting from industry, which exacerbates the threat of asymmetric information between public authorities and the industry.

Independent third party verification both prior to entering the agreement to verify pre-agreement data and of regular monitoring data is a best practice in monitoring. This is applied, for example, in the Flemish and Walloon regions of Belgium, Denmark, and Germany. Reporting in a web-based monitoring database operated by a third party streamlines the process and reduced the administrative burden on program participants (e.g. in Finland and Sweden).

7. Administrative costs of the VA systems

Table 4 summarises the annual administrative costs estimates, as reported by national authorities, of the VAs in Denmark, Finland, Ireland, Sweden and the Netherlands. As can be seen, some estimates include only the public authorities' manpower costs (Denmark and Sweden), which have been reported in the range of 150,000-270,000 Euro/year. Other estimates include public authorities' manpower cost and also public authorities' subcontracting costs related to the VAs – reported by Finland to be approximately 1 million Euro/year. The Netherlands – which has the most extensive VA system - has allocated 25.5 million Euro for 2010 for administering the LEE, LTA3 and to support of the energy centre SME for small companies. The cost estimate of the Netherlands includes actions to support the development of roadmaps for relevant sectors, evaluate the energy efficiency plans of the companies, support of the authority to enforce legal obligations, as well as costs of developing tools and large-scale communication.

Some estimates are also available for the public expenditure associated with VAs: for instance, in Sweden tax exemptions amount to 15 million Euro/y, in Finland energy audit subsidies amount to 1.5-2 million Euro/year on top of 2-6 million Euro/year on energy subsidies for VA participants and in the Netherlands subsidies and fiscal instruments in the support package for 2010 amount to 80 million Euro.

Finally, in some cases estimates are available for the annual costs incurred by VA program participants: Ireland and Sweden estimate these at the range of 10,000-20,000 Euro/year and these numbers include energy audits, plans and other reporting provisions. Finland provides total estimates for all the associations that participate in the agreements managed by the Ministry of Employment and the Economy (MEE) spending a total of 145,000 Euro/year, including delegating summary reporting from the associations to Motiva.

Table 4. Administrative costs of VA systems

COUNTRY	ANNUAL ADMINISTRATIVE COSTS: PUBLIC AUTHORITIES	ANNUAL ADMINISTRATIVE COSTS: PROGRAM PARTICIPANTS
DK¹	270,000 Euro/y (3 full-time staff at the Danish Energy Agency)	
FI²	Approx. 1 million Euro/y administrative costs, including: <ul style="list-style-type: none"> • Motiva: approx. 1 million Euro (roughly equally spread between own work and subcontracting) • Ministries: approx. 30,000 Euro In addition (public authorities (MEE)): <ul style="list-style-type: none"> • 200,000 Euro on a 2-year energy 	Associations which are participants in the agreements: approx. 145,000 Euro (including delegating summary reporting from the associations to Motiva)

	<p>advice project (2009-2010)</p> <ul style="list-style-type: none"> • 500,000 Euro on a 3-year internet-based monitoring system • 1.5-2 million Euro/y on energy audit subsidies • 2-6 million Euro/y on energy efficiency subsidies (in 2010 increased to 8-9 million Euro) 	<ul style="list-style-type: none"> ○ part (about 40%) of the 2-year energy advice project (2009-2010) is financed by 5 branch associations. The costs have not been included in the cost estimate above
IE³	<p>Sustainable Energy Authority Ireland: Approx. 500,000 Euro/y, including;</p> <ul style="list-style-type: none"> • 1 Programme Manager • 8 Agreements Support Managers (Part-time) • Special Investigation Grant Support • Recruitment process Gap Analyses • Data collection, analysis and Annual Report • Other supports (training, workshops, case studies and other publications) • General administration (query support and grant processing) 	<p>Varies, for large companies with annual expenditure on energy in the range of 10-20 million Euro: 10,000-20,000 Euro/y with certification in the range of 2-8,000 Euro.</p>
NL⁴	<p>Public authorities:</p> <p>25.5 million Euro in 2010 (72 full-time equivalent staff) including support in the development of roadmaps for relevant sectors, evaluation of the EE plans of the companies, support of authorities to enforce legal obligations.</p> <p>In addition subsidies/fiscal instruments: 80 million Euro</p>	
SE⁵	<p>150,000 Euro/y for the Swedish Energy Agency;</p> <p>In addition (public authorities) Tax exemptions amounting to approx. 15 million Euro/y</p>	<p>Each participant company:</p> <p>10,000 Euro for certifying the EMS (one-off)</p> <p>At least 10,000 Euro for energy audits and plan (at application and 2 times over the 5-year period)</p>

¹ Source: Danish Energy Agency

² Source: Motiva. The above numbers only cover the VAs where the responsible ministry is the Ministry of Employment and the Economy. The other Ministries' budgets are considerably smaller.

³ Source: Sustainable Energy Authority Ireland

⁴ Source: Agentschnap NL. The costs refer to the LEE, LTA3 and support of the energy centre SME for small companies.

⁵ Source: Swedish Energy Agency

8. Results

8.1. Energy savings

This report points to the fact that VAs in different MS have profoundly different characteristics and cover different sectors and parties. Table 5 presents the results achieved by different national VAs, as they have been reported by authorities in charge of the schemes. Estonia and Slovenia have been excluded from the table because no data is available for the results achieved, apart that targets have been met.

It needs to be emphasised that at this point the authors are not in a position to validate these reports and that any systematic cross-country comparison of results is pre-mature due to the design differences in the schemes and the lack of common reporting and measurement methods applied to date.

Table 5. Results from the VAs in the EU

	Program duration	Program	Results	Reporting period for the results
BE	2003-2012	Flanders Benchmarking Covenant	0.18 TWh	2005
	2005-2013	Flanders Auditing Covenant	8.4 TWh	2007
	2003-2012	Walloon		
DK	1996-	CO ₂ tax and VAs	1.1 PJ	2000-2003
FI	1997-2007	Energy Conservation Agreements	9 TWh/y	1997-2007
	2008-2016	Energy Efficiency Agreements on the Improvement of energy efficiency in Industries	793.2 GWh/y	Measures implemented in 2008, savings 2009-2016
	2008-2016	Municipal Sector Agreement (KETS and KEO)	3.7 GWh	Measures implemented in 2008, savings 2009-2016
	2008-2016	Höylä III Energy Efficiency Agreement	113.3 GWh	Measures implemented in 2008, savings 2009-2016
	2002-2012	Energy Conservation Agreements - housing property sector		No data
DE	2000-2012	Joint Declaration of the German Industry on Climate Protection	160.5 million tCO ₂	1990-2008
IE	2006-	Energy Agreements Program	6% reduction in energy intensity	2007-2008
SE	2005-	Program for Energy efficiency in energy intensive industries	1 TWh	planned
NL	2008-	LTA3	7.98 PJ	2008
	2009-	LEE		No reports yet
	1999-	LTA1 (supermarkets and NL railways)		No data
	2007-	LTA-e+ (flower bulb growers, mushroom growers)		No data
UK	2001-	Climate Change Agreements	9.2 MtCO ₂ /y	1990-2001 (absolute savings from baseline - target period 4)
	2009-	Energy Efficiency Agreements		No reports yet

8.2. Comparative aspects of VAs and legislation

No solid direct quantitative comparison of VAs and legislation is feasible for a number of reasons, most importantly because these tools cannot be anywhere close to delivering comparable results in terms of savings or emission reductions. The very nature of VAs and the process behind them allows including obligations that can be very contentious – if not impossible – to pass through in legislation. This has been confirmed by national authorities in charge of VAs in three MS with long experiences with this policy – Finland, Denmark and Sweden.

From the perspective of public authorities VAs have a number of advantages in comparison to legislation:

- More flexible and quicker to introduce (given a successful track record of cooperation between public authorities and industry),
- Easier and quicker to update and upgrade than regulations thus allowing to follow technological evolution and market changes. This flexibility allows VAs to achieve environmental benefits in a shorter time compared to other policy instruments, whose introduction and especially modification may be cumbersome;
- Providing better assurance to attaining targets than other policy tools (e.g. energy saving targets), especially if linked to tax exemptions that are to be repaid in case of non-compliance;
- In general more acceptable by industry as a policy instrument compared to legislation or taxation;
- VAs may help authorities hold down implementation costs incurred by industry and exploit “soft” side effects such as dissemination of information and awareness raising;
- VAs may provide a way to address the information asymmetry between public authorities and firms about the existing technical possibilities for e.g. improving energy efficiency in end-use products or production processes, and the costs of implementing these possibilities [2].
- VAs bring the freedom of adapting the targets and methodology to each industrial sector. VAs allow tailor-made solutions both for the specific industrial sector and for individual companies within the sector. An individual sectoral approach allows accommodating each individual industrial branch's own specific production processes, patterns of energy consumption and energy efficiency potential. These specifics, along with the fact that industry itself has the best knowledge of the production processes and the technologies required to improve efficiency, makes it difficult to design regulation that is built upon ‘real-life’ thorough knowledge of production processes and flexible enough to adapt to the different and specific characteristic of each sector.
- Unless VAs rely heavily on subsidies and tax exemptions, VAs can release the burden on public budgets.

In the context of the present report Finland, Denmark, Sweden and the Netherlands – the four MS with longest experiences with VAs – have been approached in order to clarify the grounds on which VAs have been selected vis-à-vis other policy tools, such as legislation. No definitive response has been received from the Netherlands. The responses are summarised below.

First, no calculation of the comparative benefits or shortcomings of VAs and other policy tools to the state budget exists in Finland, Denmark or Sweden.

Second, it has been considered next to impossible to get the level of obligations embedded in VAs in force through legislation. One practical example is reporting: in Finland, VAs introduce annual reporting obligations, which would quite likely have been unrealistic to

introduce by law. This important advantage of VAs over legislation has largely eliminated the need to compare the costs of VAs in a comparative perspective simply because it has been considered that no identical results can be attained by legislation. It has been emphasised that with a VA it is possible to agree that some details will be dealt with later, which is not really an option with national legislation.

Some quantitative estimates have been provided by Finland: in the scope of the Municipal Sector Agreements, Finish authorities have estimated some 450-500 man-hours preparing the VA model for municipalities, including six persons representing the six largest municipalities, one expert from Motiva and one from the Ministry. The preparation took some 10-12 meetings.

In comparison, the preparation phase to make a proposal for a new law would require considerably more work for public authorities. With the same content a legislative proposal would take 750-1000 hours just to get a version ready for approval. On top of this estimate legislation would need some 100-200+ hours to fulfil all official steps needed. The VA with municipalities in Finland is 9 pages, while a law proposal is usually more than 40 pages, of which articles account for less than a quarter and the rest being formal legal requisites. The process to negotiate and write a legislative proposal and a VA may be quite similar up to the point where the ministry hands over the legislative proposal to the government.

Third, while administering VAs is heavier (e.g. more expensive) than legislation, no valid direct comparison is possible because the administrative process of legislation is rarely considered to include monitoring. Thus, usually monitoring of the implementation, which increases the administrative cost of VAs is not accounted for in the administrative cost of legislation. Thereby, legislation may appear to have lower administrative costs of implementation, but also much less data on the actual results achieved.

Fourth, at least in the Finish context once a legal obligation is in place, no subsidies are given and possibly less promotion is needed, which makes legislation lower cost than VAs on this criterion. In contrast, subsidies for implementing measures under the VAs and for promotion makes VAs higher cost than legislation, but implementing measures increase the effectiveness of VAs and potentially bring larger savings. In Finland, the annual subsidies allocated for 2010 amount to some 8-9 million Euro and in the Netherlands subsidies and fiscal instruments are expected to amount to 80 million Euro in 2010.

No comparative cost-benefit analysis of VAs vis-à-vis other policy tools has been undertaken in Denmark. In the mid-90s it was decided to introduce a CO₂ emission reduction target and the exact contribution of industry to this reduction was decided. Green taxes on energy have been introduced. In order to retain the competitiveness of Danish industry, it was decided to channel the proceeds of green taxes back to industry, in order to improve its efficiency. VAs were introduced so that companies with a VA could get part of their taxes back.

Taking into consideration the impracticality of a direct quantitative comparison of VAs and legislation – with the inherent unfeasibility for delivering identical results both in terms of savings and of monitoring – Table 6 nevertheless offers a back-of-the-envelope qualitative comparison of the public expenditure involved in preparing, adopting, enforcing and monitoring VAs and legislation. The smiley face points to the lower cost option. Effectiveness has been also included in the case of implementation and monitoring.

Table 6. VAs and legislation: qualitative comparison of costs¹

		Voluntary agreements	Legislation
Preparation costs		J	L
Adoption costs		J	L
Implementation	Costs (e.g. subsidies and promotion)	L	J
	Effectiveness	J	L
Monitoring	Costs	L ²	J (but usually no proper monitoring)
	Effectiveness	J	L

¹ Based on the experience with VAs in Finland and information provided by the Finnish Ministry of Trade and Industry

² Monitoring of the implementation, which increases the administrative cost of VAs, is usually not accounted for in the administrative cost of legislation. Thus legislation would be more expensive if the savings delivered by legislation were to be monitored at the same level of detail as the savings delivered by VAs

9. Summary: key characteristics of voluntary agreements, success factors and barriers

A large energy savings potential remains largely unutilized in industrial systems because it is embedded in industrial operations and management practices. Industrial systems are ubiquitous in the manufacturing environment, but their applications are highly varied. System optimization cannot be fully achieved through component standards or labelling or “one size fits all” approaches.

For these reasons, across the EU the large majority of VAs has been **focussed on energy consumption in industrial processes**. While large industrial energy users are most commonly under VAs, this instrument is increasingly applied with respect to medium-size industrial users, the service sector and, most recently, transport and the public sector.

Some VAs rely strongly on **financial support** provided by public authorities to assist signatories in implementing measures to comply with their targets (including, for example, support for energy audits and plans), while other VAs have been introduced complementary to **energy or CO₂ taxation** giving the possibility to qualify for tax credits or rebates if certain energy efficiency commitments are taken.

All existing VAs have some kind of **target** for participating parties and often mandate various planning and **implementing activities** that are expected to put signatories on the path to meeting their targets.

In exchange for these commitments, authorities defer legislation, provide easier access to environmental licenses, ensure financial support to undertake certain actions, allow for energy or carbon tax exemptions or reductions, and/or establish programs that involve government and public recognition, provision of information on energy-efficient technologies, government assistance and training in energy management.

Reporting and monitoring – that rely on self-reporting from industry – and evaluation – that relies on pre-agreement data supplied by industry – are considered to still be the **weakest points of VAs**. Ensuring appropriate resources to engage **independent third parties verifying** data and reports is one way to address this weakness. The results reported under the existing VAs show that parties have generally met their targets – in some cases well in advance. Rapid compliance with targets may nevertheless signal lenient targets.

It needs to be emphasised that by engaging signatories in energy audits, consumption monitoring, EMS and energy efficiency project implementation, VAs are expected to point to cost-efficient opportunities and **overcome the lack of interest** in non-core activities and engage the industry and other sectors in energy efficiency in a systematic manner. This highlights the fact that **in VAs auxiliary actions and obligations – such as energy audits, energy management systems, energy efficiency requirements in procurement, etc. – and the financial support for these may have greater importance than targets themselves.**

As pointed out in section 8.2., voluntary agreements offer a number of advantages to public authorities to ensure progress is made on energy efficiency and/or GHG emission reduction targets. Like with other policy tools, the effectiveness of VAs strongly depends on the political will and engagement in investing resources and efforts to design, implement and evaluate this policy tool. The success of VAs strongly depends on the existence of culture of **trust and cooperation** between public authorities and sectors targeted and on the existence of a credible **reporting, monitoring and evaluation regime**, along with a **proper institutional framework** (see below). These elements are pre-requisites for VAs delivering results on the short term and in a cost efficient manner. At the European level, VAs for end-use products have worked as an alternative to direct regulation, which reduces compliance flexibility (see Annex I).

Yet, VAs have been criticised as prone to a number of risks, including:

- No specific obligations and/or lenient targets that reflect little more than BAU. This may happen in particular if the public authorities have incomplete information to establish the saving potential and the costs to industry to capture this potential;
- VAs do not assure that targets are met: the only possible remedy to this are sanctions that are substantial and proportionate to non-compliance and “naming-and-shaming“. To avoid under- or non-compliance it is helpful to introduce general ‘framework’ targets (e.g. CO₂ emissions reduction targets) through legislation and only then introduce VAs when it comes to attaining targets;
- Deficiencies in compliance monitoring and self-reporting and difficulty in establishing the policy additionality of VA activity vis-à-vis BAU.

These deficiencies can be addressed by a proper institutional framework, which – in the authors' view – includes the following core elements [see also 3, 4, 5, 6]:

- Ambitious but realistic **targets** (quantified commitments) that go beyond business-as-usual and are set by legislation or national policy, transparent preparation and negotiation of rules and targets,
- A transparent **process of negotiating** and setting the targets;
- Having a public **authority** with appropriate energy statutory powers and expertise in charge of the agreements;
- **Coverage** of a major part of an industrial branch (number of players) for **significant actions**, most importantly effective implementing provisions relying on energy management and/or energy audits, over a reasonable **timescale**,
- Effective and independent **monitoring and evaluation mechanism**, based on robust indicators and followed by third party verification with reporting made public,

- Credible and enforceable mechanisms to **discourage non-compliance**, including sanctions or the introduction of other policy instruments such as taxation or regulation if no results are delivered or no satisfactory targets are agreed.
- **Accompanying measures**, such as free or subsidised energy audits, technical assistance, information, financing for implementation, etc., are in most cases needed to facilitate the implementation and success of agreements.
- Importance of **pre-agreement data** for the evaluation of the VA (as opposed to ongoing compliance monitoring) to point whether the VA is effective,
- Importance of **capacity building** within public authorities related to VA design, implementation and evaluation.

Administrative costs of existing systems vary widely. As expected, they are very much a function of the size, comprehensiveness and degree of elaboration of national systems. For example, annual administrative costs incurred by public authorities in relatively smaller VA systems are in the range 150,000-500,000 Euro/year. Larger and more comprehensive schemes – such as the ones in Finland and the Netherlands – have much higher administrative costs, in the range of 1-25 million Euro/year³. On top of this comes public expenditure associated, for example, to tax exemptions and subsidies, which – depending on the size of the incentive and the size of the country – can amount to 80 million Euro/y⁴. While a direct comparison to legislation is difficult, it needs to be pointed out that VAs imply much lower costs when it comes to preparation and VAs contain the costs of monitoring and evaluation, which costs are typically omitted in the case of legislation.

Finally, it needs to be pointed out that despite statements of intention to introduce VAs declared in the NEEAPs of a few MS, as of December 2009 it appears that only two VAs were introduced after the ESD came into force: the Energy Efficiency Agreements introduced in the UK targeting transport fuel companies and the new VAs (EEAs) in Finland. Pilot projects aside, only two new MS – Slovenia and Estonia – have operational VAs; in the case of Estonia these are rather generic environmental VAs.

Furthermore, France and Austria have phased out their agreements as these were targeting CO₂ emissions for the energy intensive industry, i.e. they overlap with the ETS. MSs that have traditionally applied VAs – such as the Netherlands, Finland, Denmark and, more recently, Sweden – are very keen on this tool and have identified ways to sustain their industrial VAs along with the ETS.

10. Recommendations

A VA policy package that builds on an appropriate framework (see previous section) and features with mandatory energy management and energy audits, information and financial incentives, can be a very effective tool for:

- **Delivering electricity savings in the industrial sector**

Mandatory Energy Management and energy audits are expected to unleash the sizeable energy savings potential in industrial electricity systems that is not covered by the ETS, which only covers direct emissions.

³ 1 million in the case of Finland and 25.5 million in the case of Netherlands (2010 plans).

⁴ In Sweden tax exemption amount to 15 million Euro/year, in Finland annual spending on subsidies related to VAs is in the range of 8-9 million Euro (2010 plans), while in the Netherlands subsidies and fiscal instruments amount to 80 million Euro (2010 plans).

- **Promoting energy efficiency in non-energy intensive industry and in SMEs**

VAs could form an important part of a policy portfolio targeting non energy intensive industrial branches, especially organised (consolidated) sectors.

- **Raising the attention to energy efficiency in transport.**

ANNEX I: COUNTRY FILES

AUSTRIA

Note: Austria has not been covered in the report because, as confirmed by Austrian authorities, the klima:aktiv program does not constitute a voluntary agreement, but is only an umbrella of voluntary initiatives.

Since 2004 the program klima:aktiv gathers all voluntary and supportive measures under one umbrella. In the four thematic clusters – Buildings and Energy Efficiency (with 8 sub-programs), Municipalities (with 2 sub-programs), Renewable Energy (6 sub-programs) , and Mobility (7 sub-programs) - specific programmes are carried out by various programme managers of different institutions. In addition, since 2005, there are agreements with the Austrian Federation of Limited-Profit Housing Associations (GBV) and the Austrian Association Of Real Estate Experts (ÖVI).

There are 41 industrial enterprises that participate in the program klima:aktiv Energieeffiziente Betriebe. Klima:aktiv mobil has 700 transport partners and offers consulting, funding, awards and certificates targeting businesses and public administration, cities, municipalities, regions and provinces, leisure and tourism industries, schools and real estate developers to develop intelligent mobility management concepts, alternative propulsion systems and fuels, fuel-saving driving, cycling and other transport measures.

Both individual companies and associations are eligible to enter the klima:aktiv program. There are different regimes for different sectors: in the case of agreements with companies and communities, program participants agree to implement specific actions to reduce CO₂ emissions and the impact of these actions is estimated. The agreements with the GBV and ÖVI are rather general: the agreement with GBV aims at an emission reduction of 200,000 tCO₂ in 2012. The GBV agreement aims at the reduction of 150,000 tCO₂ in 2012.

Program participants benefit from the strong PR efforts of the Austrian Energy Agency, most notably the klima:aktiv logo, but also strong technical assistance and advice.

The Austrian Energy Agency is in charge of gathering and checking data from klima:aktiv. The results of the agreement with ÖVI are not monitored; the results of the agreement with the GBV are monitored based on data gathered by the association.

According to the Austrian energy Agency, the transport sector participants in klima:aktiv mobil have delivered 325,000 tCO₂/year.

The participants in the klima:aktiv Energieeffiziente Betriebe program have delivered 150 GWh of savings.

BELGIUM - FLANDERS

A. General (policy) framework

There are two voluntary agreements in Flanders – the Energy Efficiency Benchmarking Covenant (2003-2012) and the Auditing covenant (2005-2013).

The Benchmarking Covenant is an agreement between the Flemish Government and the large energy intensive industry to realise the best international standards (“world top”) of energy efficiency, based on international benchmarking and implement all measures up to 2012 fixed in a plan which is updated every four years and monitored every year. The second phase on the covenant started on 1 January 2008. The Benchmarking Covenant was introduced in response to Kyoto targets. Its global objective is improvement in energy efficiency of 7.4% by 2012 as compared to 2002.

The global objective of the Auditing Covenant is 1.25 TWh in energy savings by 2012.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

The Benchmarking covenant covers 187 energy-intensive companies that account for 80% of Flemish industrial energy use. Facilities with annual energy consumption above 0.5 PJ can join; in specific cases industries below 0.5 PJ may decide to take part in the covenant.

The Auditing covenant covers 230 medium-sized companies that account for 10% of Flemish industrial energy use. It targets medium-sized energy-intensive industrial companies with an annual primary energy consumption between 0.1 and 0.5 PJ, which have not signed up to the Benchmark Covenant. The energy consumption of the medium-sized energy intensive industrial companies that have signed up to the Audit Covenant accounts for 4% of the energy consumption within the scope of the ESD.

C. Obligations/commitments

By participation in the *Benchmarking Covenant* industries commit themselves to bring and/or keep the energy efficiency of their process installations on the best international standard by 2012, taking into account that the best standard will improve in the meantime. The Best International Standard is determined by an approved benchmarking consultant following full benchmarking⁵, region benchmarking⁶ or best practice⁷ methods. The benchmarking studies are performed by consultants, per process installation. If none of the benchmarking methods is possible, an energy auditing principles are applied to estimate the potential energy efficiency improvements. Then the standard is the own installation after execution of all economically efficient measures with internal rate of return above 15%.

At latest 1.5 year after entering the covenant, each participant draws up an Energy Plan which contains all measures necessary to realize and maintain the best international standard. The terms to realize these measures are defined by the covenant, based on the economic efficiency. From that moment on, the industry will annually draw up a monitoring and progress report.

⁵ In the full benchmark all comparable installations in the world are involved, and the best standard is defined as the best decile (the 10% best industries)

⁶ In the region benchmark, the best regions are involved and the average of the best region is defined as best standard.

⁷ in the best practice method, only the very best in the world is looked at, defining the best standard as a 10% higher specific energy consumption;

Undertakings that sign up to the *Audit Covenant* voluntarily arrange for two audits to be carried out to evaluate their energy saving potential – one in 2005 and one in 2009. They undertake to implement effectively all cost-effective measures with an IRR of at least 15% after tax, as included in the covenant, within four years of acceptance of the energy plan submitted. An accepted energy plan is valid for four years and must be updated six months before the acceptance expires. All measures of the updated energy plan with an internal rate of return of at least 13.5% after tax must have been implemented within four years of the date of the application for acceptance of the updated plan.

D. Instruments (motivation for joining, incentives, penalties)

As compensation for the efforts of the industries under the *Benchmarking Covenant*, the Flemish Government guarantees that it will not impose additional measures on covenant participants concerning energy efficiency or CO₂, in particular levies and emission ceilings.

As the Flanders Region has no specific energy tax, within the *Audit Covenant* the government attempts to ensure that the companies are granted exemption from the federal energy tax. In addition, Directive 2003/96/EG provides for the possibility of full or partial exemption from the minimum Community energy taxation levels for covenant companies if it can be demonstrated that an equivalent energy saving will be realised. Under this arrangement, the companies who have signed up the Audit Covenant are fully or partially exempt from a number of duties. Furthermore, companies from the target group that do not sign or implement the covenant, lose the right to degressivity of the federal electricity contribution.

E. Reporting provisions and monitoring

The calculations of the best international standards and the execution of the covenant are followed by the independent Verification Office.

F. Results

It has been reported that the Auditing Covenant has led to 0.18 TWh of primary energy savings annually (between 2005 and 2006). The Benchmarking Covenant is reported to have brought 8.4 TWh of primary savings annually (2007).

BELGIUM – WALLOON

A. General (policy) framework

Voluntary agreements were introduced in 2003 via Walloon Decree of 20 December 2001 as long-term agreements between industrial sectors and regional authorities. They last till 2010 or 2012 (depending on the agreement).

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

154 enterprises representing 199 sites and 90% of the industrial energy consumption in Walloon are under the voluntary agreements. The voluntary agreements are between regional authorities and industrial sector associations.

Only 2 agreements (out of 15) are company specific.

C. Obligations/commitments

The quantitative targets of the Walloon agreement are at sectoral/branch level: enterprises estimate their GHG and efficiency potentials that form the basis for branch associations to negotiate branch level targets and commit to final branch level targets (10 years after the signature of the agreements) and intermediary targets (2005).

Enterprises sign the agreement with the association representing their respective sector.

By signing the branch agreement, enterprises contribute to the branch targets: each company fixes a target in terms of energy efficiency improvement or GHG reductions. These are based on energy audits: enterprises commit to undertake energy audits to identify the energy saving potential and to prepare plans for emission reductions and improving energy efficiency. The audits point to three classes of measures - feasible (category A), feasible contingent upon an additional study (category B) and requiring further technological advancement (category C) – and estimate the profitability of measures in terms of payback time. Enterprises have to implement all measures with payback time below 4 years (in some case 5 years). Enterprises may opt to not implement these measures insofar as they demonstrate that they implement initiatives of similar effect.

D. Instruments (motivation for joining, incentives, penalties)

The government undertakes to not impose additional requirements (regulation, taxation, etc.) and to give financial backing to energy audits in the field of energy and emissions concerning the VA signatories.

Participants can benefit from subsidies for energy audits and for feasibility studies on energy saving technical measures, and from the usage of free energy audit and data collection software. They can also receive energy tax rebate or exemptions, depending on the energy intensity of the company.

If the steering committee and the government establish that commitments were not respected during a certain period, they may request a financial compensation that must remain inferior to the double of advantages obtained during the period of non respect. That procedure can only be applied after several calls to the company/sector to correct the situation. The procedure has never been applied.

E. Reporting provisions and monitoring

Enterprises have to report on their performance annually; these reports have to be certified by an auditor. Only branch level reports are publicly available. Enterprises report in terms of IEE (energy efficiency improvement) or IGES (GHG emission reductions).

An independent energy consultancy acts as a technical expert and assists the steering committee – comprised of public authorities and industrial branch associations – with methodological advices.

Statutory auditors are requested to verify data provided by companies when verifying annually the financial statements of the companies. Independent auditors designated by steering committees are requested every 3 years to verify if methodologies are correctly applied by sector associations and companies.

F. Results

No data.

DENMARK

A. General (policy) framework

Since 1996 Denmark has used voluntary agreements on energy efficiency as an instrument to improve the energy efficiency in industry. The voluntary agreement scheme is closely integrated with the Green Tax Package as companies, who enter an agreement, receive a rebate on the green taxes. The Green tax Package was elaborated prior to and independently of the Kyoto protocol. The main objective of the Package was to reduce CO₂ and SO₂ emissions from trade and industry. The VA scheme has been evaluated and revised several times since the launch in 1996. A major revision entered into force in 2002⁸.

In addition, in 2004 Denmark passed a CO₂ quota law, which removes the CO₂ tax from the process energy to which the ETS applies. However, electricity consumption and fuels used for space heating are still levied a CO₂ tax.

In June 2009 the Commission authorised the Danish CO₂ tax reductions to companies under the ETS, on the condition that the reduction is amended so that all concerned companies pay an energy tax respecting at least the harmonised minimum tax level.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

The CO₂ tax and VAs are differentiated between three energy applications: heavy process, light process and space heating with heavy process subject to the lowest CO₂ tax and space heating the highest. All companies with heavy processes are eligible to enter a VA⁹. Companies with light processes can enter a VA if the company's tax on energy use exceeds 4% of the company's value added. Prior to the 2002 changes the criteria was 3% of value added. Energy use for space heating became eligible for VAs after the 2002 revision.

Companies can either sign an agreement individually or as a member of a group of companies with uniform processes, products and energy-use patterns. A group agreement includes guidelines for mandatory requirements that companies have to fulfil. One third of the participating Danish companies have signed group agreements.

As of April 2008 there were 282 industries with energy agreements. There are five sectors with collective agreements. The companies that are part of the Danish allocation plan for CO₂ emissions allowance trading drop out of the VA scheme concerning the energy use that is under the CO₂ emissions allowance trading scheme. These companies can still have a VA for the electric energy.

The energy use covered by VAs is estimated at around 60% of total energy use in trade and industry in Denmark.

C. Obligations/commitments

The Green Tax Package comprised three policy instruments: green taxes, subsidies and VAs. The VAs contain the following elements: energy management system (EMS), energy audit/energy flow screening, special investigations and energy saving projects (investments).

In order to enter a VA the company must implement an EMS, which also includes guidelines on energy efficient procurement. The EMS is the cornerstone of the revised VA scheme and

⁸ The revised scheme was adopted in a 1999 law, but only entered into force in 2002 before which it had to be approved by the European Commission.

⁹ Heavy processes include e.g. greenhouse heating and the production of foodstuffs, sugar, paper, cement and glass.

there is now a Danish standard for energy management systems (DS 2403). Companies will make the transition to the new European energy management standard adopted in September 2009.

The energy audit used to play a key role in the VA scheme. The purpose of the energy audit was to identify all profitable energy measures¹⁰. The obligation to do an energy audit before signing a VA was removed in the revised scheme. Instead of the energy audit, the participating companies must now do an *energy flow screening* covering the most energy-intensive parts of their production process. The purpose of the energy flow screening is to identify areas or parts of the production process that are relevant to study further in a special investigation, whose purpose is to identify energy saving projects.

All profitable *energy saving projects* generally have to be carried out. Profitable energy saving projects that are identified in the special investigations or by working with the EMS should be carried out during the contract period.

D. Instruments (motivation for joining, incentives, penalties)

In 1992 a CO₂ tax was introduced in Denmark levied on fossil fuels used for heat production. Fuel consumption for electricity production in power and CHP plants was exempt from this tax; electricity is taxed at the consumption level. The CO₂ tax was levied on all sectors, but trade and industry generally received a 50% refund on this tax. In addition, energy-intensive companies, those for which the taxes on energy exceeded 3% of the value added, could enter a simplified VA with the Danish Energy Authority. The VA obligated the company to undergo an energy audit and undertake minor energy efficiency measures. In return, the CO₂ tax was reduced to a maximum sum of 1300 €/yr (10,000 DKK/yr). At the time when the system was introduced the tax level was a percentage of the full tax level, equalling 13.4 Euro/tCO₂.

The 1996 Green Tax Package increased the CO₂ tax on trade and industry, which also were levied an energy tax on space heating and a SO₂ tax. In order not to increase the overall tax burden on trade and industry, the additional revenues from the green taxes should be recycled to these sectors by reducing the employers' non-wage costs for labour. Since such transfers would disadvantage the energy-intensive industry over the trade sector, the green taxes were supplemented with the VA and subsidy schemes. In 2001 Denmark changed Governments, after which the subsidy scheme was terminated.

At present industries under the energy agreements receive CO₂ tax reductions. Annual tax compensations amount to a total of 16.1 million Euros. Under the CO₂ quota law CO₂ tax has been removed from the process energy to which the ETS applies; electricity consumption and fuels used for space heating are still levied a CO₂ tax.

If a company fails to meet the obligations in its VA, the Danish Energy Authority can cancel the agreement and companies are levied the full CO₂ tax as from their last approved report or verification. Tax rebates received by the company must be reimbursed.

As of 2006 only about 5-6 companies have faced sanctions as a result of non-compliance. The Danish Energy Authority is normally willing to accept changes in the time schedule regarding the carrying out of special investigations and of energy saving projects.

E. Reporting provisions and monitoring

Each company under a VA must submit reports on its compliance with the agreement to the Danish Energy Authority. This includes an annual progress report and reports on the special investigations.

¹⁰ In heavy processes, profitable refers to PBT less than four years and in light processes profitable is defined as PBT of less than six years.

All aspects of an agreement must be verified. There is an **initial verification** when the agreement is entered and at least one more during the three-year-period of the agreement. The verification includes the state and development of the energy management system, the implementation of special investigations, the implementation of investment projects with a PBT below 4 four years that must follow the procedures for energy efficient design and purchasing.

Verification is carried out by accredited institutions. Technical experts on the relevant primary production processes are part of the verification team to ensure sufficient technical insight necessary for evaluating the complex production processes.

The Danish Energy Agency has a 3 full-time staff dedicated to administering the system.

F. Results¹¹

A 2005 evaluation of the VA scheme that covered 27 companies pointed to net impact of **1.3 PJ** for **1996-1999** and **1.1 PJ** for **2000-2003**, which corresponds to energy use reduction of 2.6% and 1.9% for each of the respective periods. In CO₂ terms one often cited estimate for 1996-2005 is an emission reduction of 6% in participating companies.

¹¹ Ericsson, K. 2006. Evaluation of the Danish Voluntary Agreements on Energy Efficiency in Trade and Industry. EIE-2003-114.

ESTONIA

A. General (policy) framework

In Estonia the Environment Charges Act (enforced on 1 January 2006) provides an obligation for owners of combustion equipment to pay pollution charges for several pollutants emitted into air (e.g. sulphur dioxide, nitrogen oxides, etc.).

The pollution charge for release of carbon dioxide into ambient air was introduced on 1 January 2000, stipulated initially by the Pollution Charges Act, which was repealed since 31 December 2005. In 2009 the pollution charge on CO₂ emissions was 2 Euro/tCO₂. In case of emission of CO₂ in larger quantities than permitted higher charge rates apply: in 2006 and 2007: 40 EUR/t and since 1 January 2008 – 100 EUR/t. The pollution charge in case of emissions into ambient air has to be paid by all enterprises that are obliged to hold an air pollution permit¹².

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

The substitution of the pollution charge is based on an agreement entered into between an industrial company or association and the Minister of the Environment. The agreement contains sanctions which may be imposed on the polluter to whom substitution of the pollution charge is granted if the person fails to comply with the substitution conditions.

C. Obligations/commitments

The financing of activities shall substitute for the pollution charge if the polluter implements, at its expense, environmental protection measures which ensure the reduction of pollutants or waste over the course of three years by not less than 15% in comparison with the last accounting year of the period prior to the implementation of such measures.

D. Instruments (motivation for joining, incentives, penalties)

The Environment Charges Act provides a possibility for substituting the pollution charge (incl. CO₂ charge) with financing activities.

There is no public financing (subsidies) involved. The Ministry keeps VA participants informed on national and international environmental legal aspects (legal acts in preparation, know-how, training, etc.).

In the case of unilateral termination of the contract, the payer of the pollution charge is required to pay all the pollution charge substituted by the contract within three months after the date of termination of the contract.

E. Reporting provisions and monitoring

There is no real system of monitoring. Companies have to submit a quarterly report on application of environmental protection measures and the documents in proof of the costs incurred to the environmental department.

¹² According to the regulation of the Minister of Environment no. 101 of 2004 the air pollution permit is obligatory for all enterprises which own and operate combustion equipment (utilizing solid fuel, liquid fuel or gas fuel) with rated capacity equal to or higher than 0.3 MW in one location. Since 2009 the CO₂ charge for electricity producers has been replaced by an excise tax on electricity.

After checking the documents and calculation of the environmental charge specified and approval of the quarterly report on application of environmental protection measures, the county environmental department shall, instead of a notice of payment of the pollution charge, send a notice on substitution of the pollution charge to the payer of the pollution charge.

Approval of the quarterly report on application of environmental protection measures may be denied if the schedule for application of environmental protection measures has not been adhered to or if investments have not been made to the extent prescribed by the schedule for application of environmental protection measures.

The final report on compliance includes a recapitulative statement on the objective of application of the environmental protection measures, compliance with the schedule and the achieved results, instruments of receipt of the work performed upon application of environmental protection measures, documents in proof of the costs incurred for application of environmental protection measures, and documents in proof of reduction of the emission of pollutants into the ambient air, groundwater or soil, or disposal of waste.

F. Results

The VAs are based on environmental issues and only have an indirect impact on energy efficiency. In general, it appears that the incentives have been too weak and general for reaching effective results and that the system mainly has a qualitative character.

FINLAND

A. General (policy) framework

Finland implemented Energy Conservation Agreements (ECA) in the period 1997-2007, followed up by the Energy Efficiency Agreements (EEA) signed for the period 2008-2016. **The VAs play a central role in the implementation of the ESD in Finland and the agreements covering the second period have been designed with an eye on the ESD provisions.**

The *Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries* cover the energy intensive sector within emission trading (industry and energy production), medium-sized energy users (industry and the private service sector) and energy services (electricity transmission, distribution and retail, and district heating and cooling). The *Municipal Sector Agreement* includes both the Energy Efficiency Agreement of large cities, municipalities and joint municipalities (KETS) and an Energy Efficiency Program for smaller municipalities and joint municipalities (KEO). The *Höylä III Energy Efficiency Agreement* covers distribution of liquid heating and transport fuels, as well as oil-heated properties. The agreements for goods transport and logistics, and public transport are under the responsibility of the Ministry of Transport and Communication. The housing property sector has an *Energy Conservation Agreement* for the period 2002-2012 that is under the Ministry of Environment. This last agreement was terminated on 31 December 2009 and replaced on 10 December 2009 by a new Energy Efficiency Agreement 2010-2016, which is in line with the other agreements and with the ESD.

A new agreement for farms in agriculture sector is in the negotiation phase under the governance of the Ministry of Agriculture and Forestry.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

As indicated above, the VAs in Finland cover the following sectors:

- Energy intensive industry (industry and energy production),
- Medium-sized energy users in industry (food and drink, chemical, plastic, technology and wood product) and in private service sector (commerce, hotel and restaurants),
- Energy services (electricity transmission, distribution and retail, district heating and cooling),
- Large cities, municipalities and joint municipalities (mainly targeting municipalities above 20 000 inhabitants),
- Small municipalities and joint municipalities (mainly targeting municipalities below 5 000 inhabitants; smaller municipalities join by registering participation with an individual accession document),
- Distribution of liquid heating and transport fuels,
- Oil-heated buildings,
- Goods transport and logistics,
- Public transport.

The parties to the Energy Efficiency Agreement on the Improvement of Energy Efficiency in Industries are the Confederation of Finnish Industries, the Finnish Food and Drink Industries' Federation, the Finnish Energy Industries, the Finnish Chemical Industry, the Finnish Hospitality Association, the Finnish Forest Industries Federation, the Finnish Plastic

Industries Federation, the Federation of Finnish Commerce, and the Federation of Finnish Technology Industries on behalf of the business sector.

By November 2009, 47 companies with 120 sites have joined the Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries. Their total energy use was 1443 GWh in 2008¹³. The target for branch associations is to have members commit to the implementation of actions in the action plans that cover 60-90% of the energy use of member companies by 2010. For energy intensive industries, the target is to have all companies with the VA scheme. For medium-sized and service sector the aim is to have 60-90% of the energy use in these areas within the agreement.

Höylä III Energy Efficiency Agreement aims at coverage of 80% of the distribution of liquid heating and transport fuels.

C. Obligations/commitments

The ***Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries*** is composed of a Framework Agreement and associated branch-specific plans, where to a company commits itself with a separate accession document. A company shall commit itself to the agreement scheme by joining the Action Plan specific to its branch with a separate accession document. A company may join several action plans, if necessary. If a branch-specific action plan has not been established in a sector where a company operates, it may join a General Action Plan as specified in the Framework Agreement.

The agreements have branch and company specific energy saving targets: targets for the sectors within the ESD are 9% for 2016 and are defined in absolute savings.

Within one year after joining the agreement the companies have an obligation to map their energy use and set overall objectives. Within two years' time the companies must identify the energy saving measures and per each site, set up energy saving targets and schedule the implementation of the measures. Carrying out detail energy analyses in all sites will take a couple of years in practise. During the following years the companies must implement measures to fulfil the obligation on continuous improvement.

The ***Municipal Sector Agreement*** has a 9% indicative target for 2008-2016, calculated in line with the provisions of the ESD and set within the agreement. Municipalities also commit to act in an exemplary way in the promotion of energy efficiency and renewables and to actively distribute information about these kinds of activities.

Within one year of joining the agreement municipalities shall also draw up an *Action Plan* presenting the measures of improving the municipality's energy use. Each municipality sets an intermediate energy saving target for 2010 and 2013. In terms of *procurement*, municipalities commit to include the energy efficiency guidelines of public procurement as part of the Municipality's procurement guidelines and instruct the personnel responsible for procurement in the use of these guidelines. In terms of *planning control*, municipalities shall develop the planning control of buildings so that the future energy and other operating costs of the building are taken into account in addition to the investment costs in the selection of appliances, construction parts and systems of the Municipality's new construction and renovations. They shall also provide guidelines for the planning and construction control of new building and renovation so that the technical choices are based on highest possible life cycle economy and energy efficiency and aim to influence the energy efficiency of the Municipality's community structure through town and traffic planning.

In terms of *energy audits*, municipalities commit to a number of quantitative targets, such as having 80% of the Municipality's buildings, measured by the cubic volume of buildings, undergo an energy audit by the end of 2010 (or 2013) with a follow-up audit on a building with an abnormal change in energy consumption based on consumption monitoring data,

¹³ Based on reporting from 95% of the participating companies.

which cannot be explained by changes in the use of the building. Starting from 2008, a commissioning audit will be carried out on all new buildings of at least 1 000 m² and on buildings that have undergone extensive renovation or the use of which has changed to a significant effect. The municipality shall also implement the measures, identified in energy audits, which are appropriate and cost effective taking the current and future use of the building into account.

In terms of *financing*, municipalities have to acquire expertise in the use of the ESCOs, identify any barriers restricting the use of the ESCO service in the municipality and, when preparing investments, take into account the possibility of using the ESCO services when the lack of funding prevents the implementation of an investment that has been estimated to be cost effective.

In terms of *monitoring*, the municipalities shall set a monthly target on the extent of monitoring of at least 80% of the energy use of buildings and the annual target of monitoring at least 90% of the overall energy use of the municipality by 2013, actively utilise the monitoring data in order to identify the needs for action and participate in development projects to develop and introduce key indicators describing the energy efficiency of the Municipality's operations and the information systems supporting the national monitoring of this agreement procedure. Furthermore, the municipalities have to ensure the necessary information and skills of its employees.

The Ministry supports the municipalities' energy audits on energy conservation and the use of renewable energy and investments related to energy conservation and renewable energy sources established in the municipality's energy audits or similar analyses.

Under the **Höylä III Energy Efficiency Agreement** the parties to the agreement will endeavour to cooperate with the end-users of liquid heating and transport fuels so that they can put into effect measures that will substantially contribute to the achieving of the 9% energy savings target in the use of energy by these customers in the period 2008-2016. Companies will also endeavour to improve their own energy efficiency. The agreement also aims at the promotion of proper maintenance of buildings and oil-heating installations, as well as improving the energy efficiency of oil-heating systems in order to reach at least 9% reduction in the consumption of liquid heating fuels in residential buildings by 2016 compared to 2005 and replacing 10,000 boilers/year. Höylä III Energy Efficiency Agreement also aims at combining the use of bio-fuel oil and other RES in both existing and new oil-heating systems with the target of biofuel oil to account for 2% of all liquid heating fuel deliveries in 2009, and 10% per cent in 2016, as well as to increase the proportion of solar-heating systems connected to oil-heating systems so that in 2016, a total of 20% of all boiler replacements and installations of new heating systems would also involve the connection of a solar heating system to an oil-heating system.

The agreement aims to implement measures that would bring about savings in the consumption of liquid transport fuels by the year 2016, compared with BAU.

D. Instruments (motivation for joining, incentives, penalties)

The Ministry of Employment and the Economy provides *subsidies for energy audits* (40% subsidy on audit costs for industry) and *energy saving investments* for companies joining the *Energy Efficiency Agreements*. The companies joining commit themselves to having energy audits and analyses made at their sites. The audit must be done according to published guidelines (Motiva) and cover all energy consumption on site.

Companies within the agreement can also apply for a subsidy on energy efficiency investments, which varies between 10 and 30%, depending on the investment type.

Under the *Municipal Agreements* the Ministry of Trade and Industry supports the municipalities in energy audits and in investments related to energy conservation and RES.

Under the *Höylä III Energy Efficiency Agreement*, the Ministry of Trade and Industry supports financially energy reviews and analyses and, together with the Ministry of Environment, contributes with funding to projects implemented on the basis of the agreement.

The Ministry may terminate the agreement of a company or municipality for not fulfilling the commitments. The participating company or municipality may have to pay back the subsidies it has received for energy audits and energy saving investments.

E. Reporting provisions and monitoring

The participating companies report yearly on their energy and water use, production volumes, implemented energy efficiency measures and their impact. The monitoring database is founded by the Ministry and developed and maintained by Motiva.

Under the new agreement the monitoring system is internet-based. The monitoring duties concerning associations named in the agreement have before been outsourced by the Confederation of Finnish industries to Motiva. In the new scheme the branch associations have the main responsibility in remaining the companies to report, the preparation of the yearly reports etc. and Motiva has an assisting role.

Under the *Municipal Sector Agreement* municipalities report on the energy use of the previous year, the actions in accordance with the agreement and the implementation of the set targets to Motiva by the end of April each year.

The Oil Industry Service Centre is responsible for the implementation of the *Höylä III Energy Efficiency Agreement*. The companies must, by the end of February each year, submit the information on the distribution of liquid heating and transport fuels in the previous year and any other necessary information to the Oil Industry Service Centre so that aggregated statistics can be published. The Companies that have adopted the energy-efficiency system must, by the end of February each year, submit reports on their own energy use and measures for making it more efficient to a monitoring system maintained by Motiva.

The annual costs of the Finnish system include approx. 1 million Euro/y administrative costs, 1.5-2 million Euro/y on energy audit subsidies, 2-6 million Euro/y on energy efficiency subsidies (in 2010 increased to 8-9 million Euro), as well as some ad-hoc projects, such as a 2-year advice project (200,000 Euro over the period (2009-2010) and a 3-year internet-based monitoring system (500,000 Euro).

F. Results

The total energy savings under the Energy Conservation Agreements amount to **9 TWh/year** over their lifetime achieved via measures reported as implemented in industry, energy sector, municipal sector, property and building sector. This equals more than 2% of Finland's total energy consumption in 2007.

Measures implemented in 2008 by the participants in the Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries will deliver over the period 2009-2016 793.2 GWh of savings of which 45.6 GWh comes from savings in the ESD sectors. This agreement covers also ETS sector companies, as well as savings from energy production sites and from the distribution networks. Although the title is 'industries', there are also hotels and restaurants sector and commerce sector in this agreement.

Measures implemented in 2008 by the participants in the Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries will deliver over the period 2009-2016 Municipal Sector Agreement (KETS and KEO) are to deliver 3.7 GWh of savings.

Measures implemented in 2008 by the participants in the Höylä III Energy Efficiency Agreement will deliver a total of 113.3 GWh of savings over the period 2009-2016, of which

38.4 GWh is from replaced boilers and controls and 74.9 GWh is from better windows, insulation and solar collectors

The total savings from measures implemented in 2008 in the ESD sectors is 162.65 GWh and total saving from Finland's EE Agreement Scheme is 910 GWh.

FRANCE

Note: France has not been covered in the report because the AERES voluntary agreements have expired and have not been continued.

Already in 1971 France signed the first VA in Europe. In the second part of the 90s seven non-binding agreements were signed with energy intensive branches. In 2002, the government approved new VAs to reduce GHG emissions with twenty companies and three professional associations, which were grouped under the *Association des entreprises pour la réduction de l'effet de serre* (AERES). The agreement involved 21 multinational firms and three energy producers; subsequently AERES expanded to 34 member companies, as well as four industry federations, which together accounted for 60% of GHG emissions by French industry. Manufacturing firms committed to 28% overall cut in GHG emissions. The VA had two commitment periods: 2003-2004 and 2005-2007 with penalties envisaged in case of non-compliance at the end of each commitment period. AERES has now expired and has not been renewed.

GERMANY

A. General (policy) framework

The Declaration on Global Warming Prevention was submitted by the Federal Association of German Industry ('*Bundesverband der Deutschen Industrie*, BDI) in 1995. A year later the Declaration was updated (e.g. revising the emissions base year from 1987 to 1990 and introducing an independent monitoring process) and extended. In 2000 via the Joint Declaration of the German Industry on Climate Protection the BDI renewed its commitment to continue making particular efforts to reduce its specific CO₂ emissions as well as other GHG emissions.

In addition, there was a voluntary agreement with the motor vehicle industry to reduce fuel consumption in case of newly licensed cars manufactured in Germany between 1990 and 2005 by 25%; the agreement existed in parallel to the ACEA agreement.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

The 1995 Declaration covered 14 sectors of industry accounting for two thirds of industrial energy consumption.

In 2000 the BDI together with 5 umbrella organisations of German Industry and 14 associations of the producing sector under the auspices of the BDI published a "Joint Declaration of the German Industry on Climate Protection". The agreement covers approximately 4 400 companies, more than 70% of industrial energy use in Germany and more than 99 % of public power generation.

While the first agreement signed in 1995 was a unilateral agreement, the second agreement is a bilateral one, signed by 19 industry associations and the BDI.

C. Obligations/commitments

The 1995 Declaration aimed at reduction in specific CO₂ emissions and specific energy consumption by up to 20% between 1987 and 2005. The updated 1996 Declaration aimed at a reduction in specific CO₂ emissions by 20% between 1990 and 2005. The CO₂ reduction target was attained by most sectors of industry in 2000.

Via the Joint Declaration of the German Industry on Climate Protection of November 2000 the BDI renewed its commitment to continue making particular efforts to reduce its specific CO₂ emissions as well as other GHG emissions: German businesses renewed the commitment to reduce the specific emissions of all six Kyoto GHGs by 35 % by 2012 compared to 1990 levels (28% reduction of CO₂ by 2005 as compared to 1990). A supplementing agreement was concluded at the same time that contains the CO₂ reduction targets subsequently adopted in the Act on combined heat and power.

19 associations within BDI agreed to make additional efforts to achieve a specific reduction in CO₂ of 28 % as compared to 1990 and to attempt a 25% reduction in emissions of the other five Kyoto GHGs; the energy industry also signed a supplemental agreement to reduce its CO₂ emissions by an additional 23 Mt by 2010.

The declaration by the BDI is a compilation of 19 individual declarations with 18 individual branch targets¹⁴. Individual reduction obligations differ greatly between industries. Only five of the individual declarations have absolute emission targets, while the rest have targets related to relative specific CO₂ emissions or energy consumption. The targets are for 2012,

¹⁴ Industrial CHP has no concrete target to avoid double counting.

with the exception of power production (2015). There are no specific actions to which companies commit.

D. Instruments (motivation for joining, incentives, penalties)

The enterprises that sign the Joint Declaration are allowed to receive a rebate from the federal electricity tax in Germany (tax rate: 20.50 Euro/MWh).

The signatories of the Joint declaration are eligible for the electricity tax rebates over the period 2010-2012 if by the end of 2009 – 2010 or 2011 – they have **jointly** reached 96% of their 2012 CO₂ targets and they are on track to meet 100% of their CO₂ targets by the end of 2012. **As of 2008 the overall 2012 target of the declaration has been achieved, hence the electricity tax rebates have been secured.**

E. Reporting provisions and monitoring

The voluntary agreement is monitored by the RWI Essen. Individual companies report to their respective associations, which in turn provide aggregated data to RWI. RWI verifies the plausibility of the data provided by the associations using official statistics from the Federal Statistical Office.

F. Results

As of 2008 16 of the 18 branch targets for 2012 have been achieved and the overall target was overachieved (103.6%). RWI Essen reports CO₂ emission reductions of 160.5 million tCO₂ over the period 1990-2008, equal to 20.3% of the emissions of all participating sectors over this period.

The specific emissions of 10 branches were in the range of 50-80% of their 1990 levels and of other 7 branches in the range of 80-86% of their 1990 levels.

IRELAND

A. General (policy) framework

The Energy Agreements Program (EAP) was launched in May 2006 and is intended to last till 2020. Previously there was an annual self-audit scheme in the period 1994-1997 covering 73 industrial companies that accounted for one third of industrial energy consumption¹⁵.

The EAP is a subset of the Large Industrial Energy Network (LIEN): all EAP members are automatically part of the larger LIEN network. EAP is aimed at the largest energy users interested in taking a strong, strategic and systematic approach to energy management.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

EAP is a voluntary agreement between individual companies and Ireland's national energy agency, Sustainable Energy Ireland (SEI). 82 large industrial organizations are taking part as of 2009, which together represent over 100 industrial sites.

It is primarily intended for large energy users with SEI advising companies with annual energy costs of 1 million Euro to join the EAP. Participants go beyond industry and also cover the tertiary sector (retail sector, banking, semi-state entities such as the railways, etc.)

C. Obligations/commitments

The Energy Agreements program centres around the adoption of the Irish Energy Management System IS393 within 12 months (maximum 24 months).

The Energy Agreement companies will make the transition to the new European energy management standard adopted in September 2009. In addition, companies commit to complete three special investigations focussing on the viability of new energy efficient technology or changes to core processes in energy intensive areas. In doing this, companies attain the highest level of energy management, which is independently certified and helps to produce savings.

The company are expected to invest in projects that make economic sense when these arise and to investigate large potential projects to establish if they can be implemented successfully in the longer term.

SEI negotiates the entry into the program with each individual company; it does **not** negotiate with each member a time schedule for certification (other than within the three-year timeframe), a yearly percentage energy performance target, or action on projects where special investigations proved economically feasible. It is assumed that the proper design of an EMS, along with ensuring the right level of commitment to the EMS in terms of managerial, human and financial resources, assures the continued compliance with the EMS will cover these requirements by default. In addition, the EMS itself has legal and other

¹⁵ The Large Industry Energy Network (LIEN) managed by SEI is a networking and information programme for large industrial energy users. In operation for more than 10 years, it engages almost 140 of the largest energy users in ongoing relationships including site visits, workshops and annual performance reporting. LIEN members share information on energy saving technologies and techniques to maximise savings and maintain competitiveness; they aim at introducing energy management programs (without a fully-fledged certified EMS, as in the EAP, see section C). The LIEN membership together accounts for almost two thirds of all industrial energy usage and for more than 10% of national primary energy usage. In 2005 alone, LIEN members undertook energy efficiency projects that resulted in avoided energy costs of 27 million Euro.

requirements, the latter assuring that results are delivered without necessarily committing to targets.

All opportunities must be documented in a Register of Opportunities, prioritised and selected as a means to achieve yearly targets and objectives, as dictated by the annual Management Review. It is therefore considered by SEI that a company will implement a project if it is practical and economically feasible, and fits within the company's overall strategic planning.

D. Instruments (motivation for joining, incentives, penalties)

Sustainable Energy Ireland (SEI) offers tailored support to any company that shows engagement and follows on opportunities identified. .

SEI support within the Energy Agreements Programme includes assigning an Agreements Support Manager (ASM) to provide both general and technical advice and support, assessing any gaps that a company needs to fill in order to achieve IS393, identifying special investigations that could lead to opportunities for significant energy savings, providing financial support for special investigations and for IS393 implementation support, as well as organising tailored workshops and training and networking events publicising a member's participation in EAP.

The most tangible financial support for EAP participants is provided by the ASM – these are external experts in the field of the program participant, procured and paid for their services by the SEI and intended to provide mentoring and advice for approximately 8-10 days/year in the first 3-year period after a company joins the EAP and approx. 4-5 days/year for all subsequent 5-year periods. The SEI also subsidises up to 50% of the external costs of special investigations for EAP participants (up to 7,000 Euro). Finally, on yearly basis SEI decides on some capital expenditure financial support for energy efficiency projects that is open to all companies that participate in SEI programs.

There is no penalty for failing to comply with the EMS implementation within 12 months, but SEI maintains close contacts with the ASMs with quarterly meetings, being well aware in advance of any company at risk of failure to comply and starting a dialogue.

E. Reporting provisions and monitoring

Program participants have to adopt the Irish Energy Management System IS393 within 12 months after joining the program (maximum 24 months). Once the EMS is certified by an accredited external certification body, it needs an annual surveillance audit to maintain its certified EMS status and re-certification after 3 years.

The Sustainable Energy Authority Ireland allocates approx. 500,000 Euro/y to administer the scheme. These funds cover 1 programme manager and 8 agreements support managers (part-time), as well as special investigation grant support, recruitment process gap analyses, data collection, analysis and annual report, other supports (training, workshops, case studies and other publications), as well as general administration (query support and grant processing).

F. Results

In the period 2007-2008 SEI carried out an evaluation survey across 22 companies certified to the Irish EMS and reported that the implementation period for 90% of the companies ranged between 6 and 18 months. SEI programme resources had been effective, but grant incentives for special investigations were not greatly availed of during the implementation phases.

In 2007 SEI reports that EAP members have reduced their energy intensity by 8% in comparison to 2006. In 2008 SEI reports that EAP members have reduced their energy intensity by 6% in comparison to 2007.

ITALY

In **Italy** there is a range of environmental VAs, but none specifically targeted at energy efficiency. Many are signed by local authorities and individual companies and not at national level.

In July 2009 Enel signed a commitment to favour the achievement of EU environmental objectives, committing itself to develop renewable energy sources, to reduce the emissions of thermoelectric power stations, and to improve end-use energy efficiency. The Ministry and the Government pledged to accelerate the authorization procedures and to support Enel's innovative projects including at European level. Enel intends to strengthen its commitment to end-use energy efficiency: in public lighting, also through the use of LEDS; in its distribution network, through the development of smart grids; in collaboration with industrial customers through audits to optimize energy consumption. Actions of this kind will allow savings of about 100,000 toe within 2013 and 300,000 toe within 2020.

In the ESD transposition questionnaire Italy has reported voluntary agreements between transport fuel distributors, the Ministry of Economic Development or other ministries concerned and the Regions, for the promotion of sustainable mobility initiatives.

SLOVENIA

A. General (policy) framework

A voluntary agreement on reducing of CO₂ emissions has been in force since 1998 and is linked to the CO₂ tax in place. The most recent phase on the agreement has ended at the end of 2009 and at present Slovene authorities are designing the new phase of VAs.

The CO₂ tax in force in Slovenia is based on amended regulation on CO₂ taxation¹⁶. The 2005 decree keeps the logic of the previous system of CO₂ taxation unchanged: the tax is based on the quantity of CO₂ emitted by the installations. Tax rebates are conditional on signing a VA on reduction of specific CO₂ emissions. Energy intensive installations, which are part of the **ETS, are fully exempted from carbon tax payment**. The tax is at a level of 13 Euro/tCO₂.

A number of exemptions from the CO₂ tax exist: companies that produce electricity in CHP installations can be granted a tax reduction if they achieve certain energy savings, power plants feeding electricity to a high voltage transmission network, certain large combustion installations and companies that participate in the EU ETS and are not energy intensive, and companies that enter into voluntary environmental agreements.

Over the period 2005-2009 the tax reduction rate has been decreasing by 8% each year going down from 43% in 2005 to 11% in 2009. District heating installations benefit from a 26% reduction in 2005, decreasing by 8% each year.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

Since 2005 the CO₂ tax covers only non energy intensive companies and installations that are outside the ETS. All companies and individuals pay the CO₂ tax by fuel purchase. Exempted fuel producer permits are issued to installation operators who hold emission permits under the ETS and is an energy intensive company¹⁷. Companies with exempted fuel producer permit have also right to claim back already paid CO₂ tax for the period from the beginning of 2005 until the acquisition of the permit.

To be eligible to sign a VA, a company has to have annual CO₂ emissions of at least 10 tonnes. In the period 2005-2009 there were approximately 230 installations with a VA.

C. Obligations/commitments

The scheme covered the period 2005-2009. Companies had to meet a target of 2.5% specific emission reduction in 2008 with a baseline 1999-2002.

D. Instruments (motivation for joining, incentives, penalties)

The tax reductions went down from 43% in 2005 to 11% in 2009¹⁸. The tax return percentage was always according to the base period emissions – in this way the tax return does not go down with the reduction of the emissions over the years.

¹⁶ Environmental protection act, act amending the Law on Excise Duties and a governmental decree on the taxation of CO₂ emissions, entered into force on 1 May 2005.

¹⁷ An energy intensive company is a company whose costs for the purchase of fuels and electricity exceed 3% of the product value. Product value means sales revenues which are increased or reduced by changes in the stock of both final and unfinished products, reduced for goods and services purchasing costs.

¹⁸ 43% in 2005, 35% in 2006, 27% in 2007, 19% in 2008 and 11% in 2009.

In case of non-compliance with the target, companies have to repay the tax reductions received.

E. Reporting provisions and monitoring

No information.

F. Results

Most of companies (installations) met their targets.

SWEDEN

A. General (policy) framework

The VA in Sweden – called Programme for energy efficiency in energy intensive industries (PFE) – was introduced in January 2005. The programme runs for five years.

The background of the programme is Directive 2003/96/EC leading to a new minimum tax on electric power beginning from 1 July 2004. Prior to this Swedish manufacturing companies were exempt from energy tax. PFE is a way of compensating for this tax.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

The PFE targets energy-intensive industrial companies in Sweden. As of 2007, there were 117 companies with more than 250 production sites under the PFE. Together they use more than 30 TWh of electricity annually, which is about 20% of total electricity use in Sweden and more than 50% of industrial electricity use.

C. Obligations/commitments

Companies could apply to join the PFE at any time during a calendar year until 2009 and, if accepted, participate during five years starting at the turn of the month after applying.

To be eligible, the company must be engaged in the manufacturing industry, must be energy-intensive (i.e. energy costs of at least 3 % of the production value, and/or paying energy-, CO₂ and SO₂ taxes of at least 0.5 % of the value added) and must have the economic means for carrying out the program¹⁹.

In the 2-year reporting period each company undertakes measures – once a company joins the program, these measures become compulsory and their estimated results together add up to a sum that becomes the individual company's **target**. The law is written in a way somewhat open for interpretation. The participants have to achieve a level of measures that at least equals the effect that would have been reached if they instead paid the tax. By almost all program participants this is interpreted as the percentage the tax is of the electricity price, which equals 1 % as of early 2010.

An extensive energy **audit**, implementation of a standardised **energy management system** and **measures** for improving energy efficiency constitute the basic requirements of the PFE. The energy management system must also include specific routines for **procurement** of high-consumption electrical equipment, based on LCC-calculations.

The energy audit and the energy management system should be implemented within the first two years of the programme. During the remaining three years, the company should carry out its planned measures and follow its routines for planning and purchasing. All measures with PBT below 3 years should be reported to the Swedish Energy Agency and must be carried out within the programming period.

The PFE-companies must include specific routines for procurement of high-consumption electrical equipment using more than 30 MWh electricity per year.

¹⁹ The participating industries are: pulp and paper (46 companies), sawmills and wood product manufacturing (22 companies), manufacturing of chemicals, chemical products and plastic goods (16 companies), food and beverage production (10 companies) steel and metal production (9 companies), mining and ore refining (6 companies), manufacturing of mineral products (4 companies) and others (4 companies). The pulp- and paper industry uses the majority of the electricity, nearly 22 TWh annually.

There is a special emphasis on electricity savings as the program is based on electricity tax reduction.

D. Instruments (motivation for joining, incentives, penalties)

Companies who join the program are eligible for a tax exemption during the 5-year programme, on condition that they take specific steps to improve their use of energy and carry out energy saving measures in their companies.

Some companies were rejected when applying for the program or withdrew their application when they were supposed to come in with the 2-year report. 2 companies that filed reports will most probably not be approved. These will have to pay back the tax credit from the program start. This payback is handled by the tax authority.

The tax exemptions amount to approx. 15 million Euro/year, ranging between 6,000 and 1 million Euro for individual companies annually

E. Reporting provisions and monitoring

The participating companies have to report their activities to the Swedish Energy Agency twice during the programme period: after two years and after five years of the programme. The reporting is made in an electronic system, built for this purpose. The participating companies can be subject to on-site supervision.

The system is administered by the Swedish Energy Agency and the annual administrative cost of the system is in the range of 150,000 Euro.

F. Results

The 98 companies that joined the programme from the beginning made their first report to the Swedish Energy Agency in the autumn of 2006. Almost 900 measures for more efficient use of electricity have been reported so far. In total, the companies will thereby reduce their annual use of electricity by around **1 TWh**. The investment costs for realizing these measures amount to around 110 million Euros. The fact that the measures have been reported implies that the companies now are obliged to realize them within the programme period.

The measures focus on reduced use of electricity. Measures that involve substitution, such as converting from electricity to oil or any other type of energy, are not eligible in the PFE. The electricity efficiency measures do however sometimes also contribute to a decreased use of other energy products (e.g. fuels or heat). Almost half of the measures are within the production processes and the rest are within the auxiliary systems, such as pumps, fans, electric motors, compressed air systems, lighting and ventilation.

THE NETHERLANDS

As of 2010 the two major VAs in force in the Netherlands are LTA3 that targets non-ETS enterprises since 1st July 2008 and the Long-Term Agreement on Energy Efficiency for ETS enterprises (LEE) that covers ETS enterprises since 2nd October 2009).

A. General (policy) framework

Since the early 90s the Ministry of Economic Affairs has been making long-term VAs (or covenants) with various energy-intensive sectors that aim at promoting energy savings in the Netherlands. The long-term agreements are agreements under civil law. The existing agreements – or their predecessors – have mostly come before the ESD and reflect national policy targets. Nevertheless the LEE refers to the targets of the 2008 EU Climate and Energy package.

LTA1 entered into force in 1999 and focussed primarily on process efficiency focussing on the energy intensive sectors. A few years later commercial service providers, the educational sector, health care providers and a number of agricultural sectors also join in. In LTA2 (2001-2012) energy management outside the direct process and the use of renewable energy also became important elements of the LTA.

In 2007 the Dutch cabinet introduced its new policy plans. On this basis and with the support of participating industry the LTA2 was intensified, broadened and extended into LTA3, which entered into force on 1 July 2008 and has a term of validity until 2020. *LTA3 integrates LTA2 and the 1999 Benchmarking Covenant on Energy Efficiency.*

On 2 October 2009 the Long-Term Agreement on Energy Efficiency for ETS enterprises (LEE) was signed, which covers ETS enterprises and relevant trade associations and commodity boards.

In 2008 the Corporation Sector Energy Conservation Agreement [Covenant Energiebesparing Corporatiesector] was signed.

Finally, the major building associations in the Netherlands of builders and project developers (Bouwend Nederland, NEPROM en NVB) signed in 2008 “The Spring Agreement” [Lenteakkoord] on energy conservation in new constructions with the national government.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

LTA3 covers industries that had not participated in the Benchmarking Covenant (non-ETS enterprises); municipalities can become parties to the agreement. LEE covers ETS enterprises. In addition, LTA1 (1999-2010) still covers supermarkets and Netherlands Railways and LTA-e+ (2007 – 2011) targets flower bulb growers and mushroom growers.

At the end of 2008, 31 sectors were participating in the LTA. Out of these, 29 participate in **LTA3**: 18 industrial sectors, 8 sectors in the food industry and 3 service sectors. Two sectors – transport (represented by 3 companies of the Netherlands Railways) and supermarkets (24 enterprises) – are not participating in LTA3, but in an earlier version. A number of financial service providers – banks and insurance companies – also signed LTA3. In 2008, all LTA sectors participating in the monitoring process plus the wastewater plants consumed 194 PJ of energy, which equals to 15% of the national industrial consumption of the Netherlands.

Facilities that participate in the ETS are covered by the newly signed **LEE** and the Covenant of Benchmarking Energy Efficiency is amended in order to accommodate the objectives of the agreement.

The Union of Tenants, Aedes, is the signatory of the Corporation Sector Energy Conservation Agreement. With the support of national government, housing corporations and their tenants work to achieve a number of energy conservation targets. The principle underlying the agreement is that energy conservation methods will lead to lower rent for tenants. The Corporation Sector Energy Conservation Agreement targets the rental sector, affecting 2.4 million households, or 35% of all housing in the Netherlands.

C. Obligations/commitments

The objective of the **LTE3** is for parties to endeavour to achieve **an average energy efficiency improvement for the relevant facilities of the joint enterprises of 30% in the period from 2005 to 2020**. With regard to the 30%, a division will be pursued for the joint enterprises and their relevant facilities of 20% within the facility and 10% outside the facility.

The participating companies in LTA3 have to implement a three fold set of activities: developing an *Energy Efficiency Plan* (EEP) every four years, yearly *monitoring* of production levels and energy use, and implementing and maintaining an *energy management system*. Each enterprise has to draw up an EEP for its relevant facility or relevant facilities, to implement it and annually report on it and to adopt certain profitable measures²⁰ in its EEP to improve the energy efficiency within the relevant facility or facilities. EEPs were to be updated by 1 April 2009 for the period 2009-2012 and are to be updated once more by 1 October 2012 for the period 2013-2016. Enterprises have to further implement systematic energy management, to endeavour to achieve energy efficiency improvement by realising chain efficiency and renewable energy and to provide its own trade association with the data needed to draw the long-term plan on time.

Under the LTA3 trade associations and product boards have to encourage their members or affiliates to participate in and implement the LTA, actively inform its members or affiliates and act as spokesperson on behalf of the Enterprises towards the relevant public authorities. They have to further submit within 11 months of joining and implement a Long-Term Energy Efficiency Plan (LTEP), take the initiative for a preliminary study and/or roadmap and provide information for each evaluation of the LTA3. The LTEP has to cover a total consumption of at least 1 PJ/year and at least 80% of the energy consumption of the sector and has to include a quantitative EE improvement objective of the enterprises affiliated to the Trade Association. That objective must amount to at least the weighted average of the energy efficiency objectives set forth in the EEPs of the relevant facilities.

At the strategic level trade associations and product boards aim to develop and implement a Roadmap jointly with their affiliated enterprises in the period 2008-2009 to the extent possible and useful. A Roadmap is a strategic vision for 2030, which sets out the technological and non-technological aspects for achieving 50% energy efficiency improvement within the facility and within the chain in 2030 compared to 2005.

The objective of the **LEE** is to ensure that the ETS enterprises make a significant contribution to improving energy efficiency for their facilities in the period up to and including 2020 by adopting profitable measures aimed at improving the energy efficiency at their facilities and in the chain and by investigating at strategic level what the energy-saving possibilities are in the long term.

Under the LEE each ETS enterprise undertakes to draw up an *EEP* for its facilities by 1st January 2010 and to implement it. Each ETS enterprise will bring its Energy Efficiency Plan up to date by 1st October 2012 at the latest for the period 2013-2016 and by 1st October 2016 at the latest for the period 2017-2020.

²⁰ The Energy Conservation circular defines profitable measures as measures that have a positive net cash value at an internal interest rate of 15%. Alternatively, a cost recovery period of 5 years may be applied.

Under the LEE each Trade Association or Commodity Board shall carry out one or more *preliminary studies* together with the ETS enterprises affiliated with that Association or Board by 1st January 2010 to investigate if and to what extent a roadmap will provide new insights into possible energy efficiency improvements in the long term. A roadmap is a strategic vision for 2030, which sets out how to achieve an energy efficiency Improvement of 50% at the facilities and in the chain by 2030 compared to 2005.

On the basis of the EEPs, the outcome of the preliminary studies and possibly the roadmaps, a Trade Association or Commodity Board can draw up a Long-term Plan (LTP) that contains the quantitative and qualitative objectives for the energy efficiency improvement.

A core aspect of the Corporation Sector Energy Conservation Agreement is the housing corporations' pledge to increase investment in social housing. The key aim is to achieve savings of 24 PJ during the period covered by the agreement (2008-2020). Other energy conservation targets include a reduction of at least 20% in gas consumption in existing construction over the next ten years. A target of 25% reduction in energy consumption by 1 January 2011 has been set for new construction and this will be raised to 50% from 1 January 2015. In cases of major housing improvements, Aedes and the Netherlands Union of Tenants intend to bring the housing up to Energy Label B (or to improve the Energy Label by at least two levels after the improvements).

The aim of "The Spring Agreement" [Lenteakkoord] on energy conservation in new constructions agreement is to reduce the energy consumption of newly build houses from 25% in 2011 to 50% in 2015.

D. Instruments (motivation for joining, incentives, penalties)

Within the framework of LTA3 several instruments are used to support the industry, including sectoral lists of measures for improving energy efficiency (developed by SenterNovem), user groups and knowledge networks, as well as software support tools (e.g. ROI-decision making or tools for specific processes in each sector).

The termination of the LTA3 for an enterprise that fails to fulfil its obligations leads to relevant Competent Authority taking unilateral action to tighten up the environmental licence that applies to the relevant facilities or can apply other instruments.

Under the LEE if an ETS enterprise is not complying with its obligations, the Ministers shall terminate this sector accord with respect to that ETS enterprise. No sanctions are envisaged.

E. Reporting provisions and monitoring

All ETS enterprises under the LEE submit an annual report to SenterNovem. The LEE Committee will draw up a Monitoring Protocol on behalf of ETS enterprises.

All parties under both LEE and the LTA3 adopt EEPs that point to the certain, conditional and uncertain measures to improve energy efficiency, analysing the situation in the facility, describing the expected result of each measure as a percentage of the energy efficiency improvement per year and the related effectively avoided CO₂ emissions. The indication of energy monitoring and organisation, as well as of budget and manpower are part of the EEP.

The energy efficiency objectives are expressed in Energy Efficiency Improvement (EEI) and calculated with a reference year 1998.

The administration of the Dutch system of VA agreements costs 25.5 million Euro in 2010 with 72 full-time equivalent staff working on support in the development of roadmaps for relevant sectors, evaluation of the EE plans of the companies, support of authorities to enforce legal obligations, etc. In addition subsidies/fiscal instruments planned for 2010 amount to 80 million Euro.

F. Results²¹

Over the past 15 years LTA1 and LTA2 have led to an overall energy efficiency improvement of more than 2% per year.

Companies under LTA3 use the use the total energy efficiency index (TEEI) to express the results achieved: in 2008 they reported 2.6% energy efficiency improvement in comparison to 2007. In comparison to the reference year (usually 1998) till the end of 2008 the total improvement in efficiency was 23.2%. Of the improvement 42% was due to use of sustainable energy, 30% to EE product development and 28% to process efficiency.

In 2008 the total amount of savings reported was 7.98 PJ, out of which 2.8 PJ in the production process compared to 2007 (out of these two thirds were in energy saving projects in processes). Compared to 2007 the use of sustainable energy and EE products delivered 2.3 PJ and 2.5 PJ, respectively, and the purchase of sustainable electricity to another 1.9 PJ.

In the whole period 2001-2008 LTA3 sectors achieved collective savings of 22.4 PJ through the introduction of new measures in process efficiency, including production processes, buildings, utilities, good housekeeping and strategic activities.

Table 7. Results of the LTA3 agreements in the Netherlands

	Energy savings from measures (TJ)	TEEI (%)
Total industrial sectors	5860	4.22
Total food industry	1143	0.54
Total transport sector	73	2.38
Total Service sectors	899	4.92
LTA3 sectors total	7975	2.63
Supermarkets	218	3.90

²¹ Long-term agreements on energy efficiency in the Netherlands. Results of 2008. October 2009.

UNITED KINGDOM

A. General (policy) framework

The VAs in the UK are known as Climate Change Agreements (CCA) and are linked to tax reductions in the Climate Change Levy (CCL). These two instruments have been introduced in the framework of the domestic objective of the UK to reduce CO₂ emissions by 20% on 1990 levels by 2010.

CCAs were agreed between certain energy intensive users and the government in March 2001. Being party to a CCA, and meeting targets, allows relevant facilities to claim up to an 80% reduction in the Climate Change Levy, which was placed on non-domestic energy supplies from 1 April 2001.

The CCL is applied to electricity²², gas, coal and lignite, coke and LPG, but is not applied to any domestic supplies. The CCL is chargeable on the industrial and commercial energy supply of consumers in industry, commerce, agriculture, public and service sectors. The CCL is added to the bills before VAT.

In addition, in mid 2009 a voluntary Energy Efficiency Agreement (EEA) with road transport fuel suppliers was introduced to meet the requirements of the Energy Services Directive.

B. Target sectors (e.g. energy intensive industries, other sectors beyond industry, SMEs) and actors (branch associations, individual companies)

CCAs have a two-tier structure. There is a sector-level agreement between the Department of Energy and Climate Change (DECC) and the sector or trade association (known as an umbrella agreement), and individual agreements between DECC and the operator of the facility (known as underlying agreements).

Energy intensive industries can join the CCAs. Initially these were defined as industries that are covered by Part A1 or A2 headings in Part 1 of Schedule 1 to the Pollution Prevention and Control (PPC) Regulations 2000. The regulations cover a wide range of industrial sectors, from major energy intensive processes such as steel, chemicals and cement, to agricultural sectors, such as intensive pig and poultry rearing²³.

In 2006, a second wave of CCAs was rolled out covering energy intensive industrial and manufacturing sectors that were not PPC regulated. These sectors must meet strict criteria related to relative energy intensity (EI) and international competitiveness. The value of energy used must be 3% or more of production value for the sector. In addition, they must meet, or exceed, an import penetration test of 50% or more²⁴. The eligibility test is applied at sector level, not at individual company or site level.

The CCAs were originally negotiated with 44 industrial sectors. Three of these have since been terminated by the sectors for business reasons²⁵ and an additional 12 sectors have entered agreements under the energy intensity criteria²⁶.

²² Renewable electricity with a Levy Exemption Certificate (LEC) is exempt from the levy.

²³ Smaller sites that do not meet the size thresholds of the Pollution Prevention and Control (PPC) Regulations, but which otherwise would qualify, are also eligible for an agreement. The exception to this is combustion plants of greater than 50 MW capacity and the 3 MW limit for burning of waste oil, recovered oil or fuel manufactured from or comprising waste.

²⁴ This is a test that is applied to the value of the sector as a whole to determine its exposure to international competition. Sectors that do not meet the international competitiveness requirement must have an EI of 10% or more. The sector qualification is based on the average energy cost and production values for three consecutive years. The test is applied only at the beginning of the agreement so as not to disincentivise energy efficiency. Sectors that have negotiated EI agreements include industrial gases, cold storage and glass manipulators.

²⁵ , Reprotech, Vehicle Builders and Repairers and the CRT sector.

The EEA voluntary agreement applies to anyone who sells road transport fuel to the end-user. This includes anyone who runs a petrol station, sells fuel from a pump, or who sells fuel through other sites such as bunkering sites or sells direct to businesses. Companies that sign the agreement include major oil companies who own/run petrol stations, companies that run franchised petrol stations, companies that run independent petrol stations, shops or garages with fuel pumps that are not purely for their own use, companies who sell fuel to companies such as bus operators, haulage companies, car fleets, etc., fuel card companies who own the fuel they manage.

C. Obligations/commitments

In return for the CCL discount, the sector association must agree challenging targets to improve energy efficiency or reduce carbon emissions across the sector. Companies within the sector will be expected to meet equivalently demanding targets to contribute to the sector total. Thus each sector comprises a series of target units (TU) that all have individual targets. These targets are mathematically combined to form the sector target. A TU can consist of a single facility or a number of different facilities that are grouped together to form a single TU ('bubbling').

CCA have carbon saving targets measured every two years, i.e. since their introduction in 2001 CCAs have targets for 2002, 2004, 2006, 2008 and 2010.

In signing the EEA agreement, transport fuel companies agree to make sure that their customers have access to at least one fuel efficiency measure and to advertise/promote the measure(s) to your customers. Companies under the agreement can either do this themselves or arrange for someone else to do it for them, for example a transport consultancy, local garage, driving school, etc.

D. Instruments (motivation for joining, incentives, penalties)

Every two years, every target unit's performance against their targets is checked to assess whether the facility should be recertified to continue to receive the **CCL discount** for the following two years. This process is referred to as reconciliation. Reconciliation is based on the assessment of performance over a reference year defined as a Target Period.

If a facility misses its target, it can buy and retire carbon allowances in the UKETS market to make good the shortfall between performance and your target. Conversely, if a company overachieves its CCA target, it can 'ring-fence' or set aside the allowances earned, which can be traded or kept for reconciliation if they have been verified by an independent verifier.

If a facility fails its target and has not bought allowances, then this facility will be decertified. Essentially, the agreement will remain in place, but the facility will not be allowed to claim the discount from CCL for two years until the next reconciliation. If the facility reports at the next reconciliation and meets that target, then it will be recertified and be able to claim the discount again.

E. Reporting provisions and monitoring

The CCA scheme requires that facilities in the scheme are audited. Audits can take two forms: **full site audit and desk-top (remote) audits** conducted by e-mail and telephone. For both types of audits the auditor prepares a report with actions and recommendations and the facility should comply with the actions and notify the auditor when they have been completed.

²⁶ One sector (silica sand) merged with its IPPC equivalent.

F. Results²⁷

Overall 36 out of the 52 sectors under CCAs have met their targets after taking the emissions trading by operators into account²⁸. Targets are relative for all sectors except steel, aerospace, wallcoverings, supermarkets, and kaolin and ball clay, which have absolute targets.

The table below shows how the CCAs have performed overall. It shows the total CO₂ savings per annum at all four target periods compared to the respective sector base years. It also shows what savings the sector targets represent. These savings are net figures across all sectors. Some sectors with relative targets may have increased energy consumption because of increased production, whilst at the same time improving energy efficiency.

The different sectors have a range of baseline years, ranging from: 1990 to 2001 for those sectors that were in the original agreements; or 2004 to 2006 for sectors have entered agreements under the energy intensity criteria. The figures for absolute savings given below are for the savings by all sectors from their relevant baselines, they are not the savings from a single point in time.

It needs to be emphasised that the membership of the agreements at the end of each target period is not the same as that at the start of the agreements or at the first target period. In virtually all sectors there has been a number of exits and entrants. Some sector agreements may cover considerably less energy than at the start of the agreements, but some of this energy reduction may be due to exits where the facility has been closed, and may not be as a result of the CCA. Conversely some sector agreements may now cover more energy than at the start of the agreements as a result of new entrants.

Table 8. CCA results in absolute performance terms (UK)

	All sectors		
	Actual (MtCO ₂ /year)	Target (MtCO ₂ /year)	Actual minus Target Actual (MtCO ₂ /year)
Absolute savings from baseline – Target Period 1 (with adjusted Steel target)	16.4	6 (12.3)	10.4 (4.1)
Absolute savings from baseline – Target Period 2 (with adjusted Steel target)	14.4	5.5 (9.3)	8.9 (5.1)
Absolute savings from baseline – Target Period 3 (with adjusted Steel target)	16.4	9.1 (12.3)	7.3 (4.1)
Absolute savings from baseline – Target Period 4 (with adjusted Steel target)	20.3	11.1 (16.4)	9.2 (4.0)

For sectors with relative targets, the program evaluators from AEA computed the performance the sector would have achieved, if the output in the base year had been the same as that during the target period. The difference between this and the actual performance in the target period is a measure of improvements in energy efficiency. Using

²⁷ AEA Energy and environment. 2009. Climate Change Agreements – Results of the Fourth Target Period Assessment. Report prepared for the DECC. ED02973. AEAT/ENV/R/2758.

²⁸ In order to demonstrate performance against CCA targets, some sectors have reported results before and after the EU ETS double counting adjustments.

this approach, the table below demonstrates the relative savings made by the sectors with relative targets.

Table 9. CCA relative performance results (UK)

	All sectors		
	Actual (MtCO ₂ /year)	Target (MtCO ₂ /year)	Actual minus Target Actual (MtCO ₂ /year)
Relative savings from baseline – Target Period 1	10.9	8.5	2.4
Relative savings from baseline – Target Period 2	14.2	10.5	3.7
Relative savings from baseline – Target Period 3	15.6	12.9	2.7
Relative savings from baseline – Target Period 4	16.1	12.8	3.3

The EEA was only introduced in mid 2009 and no results are available to date.

OTHER VOLUNTARY PROGRAMS

PILOT VOLUNTARY AGREEMENTS

Apart from the countries that have existing VAs, **Bulgaria, Greece, Hungary, Luxembourg, Poland, Portugal, Romania and Spain** all make reference to VAs in their first NEEAPs. Of these Bulgaria, Greece, Poland and Romania have started pilot projects or other preparatory actions.

In March 2007 **Bulgaria** started a pilot project on introducing VAs with 9 individual enterprises. The pilot builds on the results from know-how transfer and technical assistance project with the Dutch agency SenterNovem that started a year earlier and ended with signing – in July 2006 – of letters of intention between the Minister of economy and energy and representatives of 5 branch associations and chambers. The pilot project started with an energy efficiency check of the enterprises proposed by the signatory branch associations. The signatories of the successive branch agreement are the Branch Association of Ferrous Metallurgy, the Bulgarian Chamber of Mining and Geology, the Bulgarian Chamber of Chemical Industry, as well as with 6 pilot enterprises. The VA has no quantitative targets, but enterprises signing commit to undertake an investment program for energy efficiency measures in production systems and buildings, which will be based on an energy audit. There will be joint monitoring of the results from a group with representatives from the ministry and branch associations signatory enterprises monitor the results of the implemented measures. The VAs were signed before the adoption of the Act on Energy Efficiency, which makes a reference to the issue.

Romania has also started a pilot project based on a partnership with the Netherlands. One pilot project has been started in one industrial company by doing a energy potential scan. **Poland** has expressed interest in a pilot project for the introduction of VAs and has submitted a proposal to the IEE program with the intention to look into the mechanism by all means. **Greece** has also expressed interest in VAs and there is a pilot phase underway for structuring the framework of an agreement.

UNILATERAL MANUFACTURERS' AGREEMENTS

The unilateral manufacturers agreements discussed below – on refrigerating appliance, washing machines, dishwashers, electric water heaters, TV and VCR standby and motors – have all expired, mostly in the light of the EcoDesign directive preparations. The recast of the EcoDesign directive points that self-regulation, including voluntary agreements offered as unilateral commitments by industry, can enable quick progress due to rapid and cost-effective implementation, and allows for flexible and appropriate adaptations to technological options and market sensitivities. In addition it indicates that for the assessment of voluntary agreements or other self-regulation measures presented as alternatives to implementing measures, information on at least the following issues should be available: openness of participation, added value, representativeness, quantified and staged objectives, involvement of civil society, monitoring and reporting, cost-effectiveness of administering a self-regulatory initiative and sustainability.

The CECED unilateral agreement on **refrigerating appliances** contained the following commitments. Participating manufacturers stopped producing for, and importing in, the Community Market electric compressor based household refrigerating appliances having an energy efficiency index 75 (corresponding to energy label class C) and above (except for chest freezers), and for electric compressor based chest freezers having an energy efficiency index 90 (corresponding to energy label class D) and above, by 31st December 2004. The agreement also includes a "fleet target": Each participant had to reduce its own production - weighted average energy efficiency index- to a value of 55 for production and importation into the EU market by the year 2006.

The **washing machine** manufacturing industry represented by CECED, the European Committee of Domestic Equipment Manufacturers, agreed upon two Voluntary Commitments (the first in 1997, the second in 2002) which proved to be very successful in driving energy efficiency of washing machines. The participants of the 1st commitment agreed to remove from the market the least efficient washing machines in two steps²⁹, agreeing to introduce an energy class, A+ (< 0,17kWh/kg and minimum A class washing performance)³⁰. The second voluntary commitment finished in December 2008 without renewal, the EU industry calling for legally binding energy efficiency requirements³¹.

The CECED agreement on **dishwashers** foresaw that participating manufacturers commonly agreed to stop producing and importing in the EU dishwashers which belong to the energy efficiency class D (for >10 place settings) or E respectively (for <10 place settings) from 31 December 2003. On 31 December 2004 the dishwasher unilateral agreement expired.

The unilateral agreement on **electric water heaters** by the main European manufacturers through CECED was concluded by the manufacturers at the end of 1999, and lasted till the end of 2003. The main terms of the agreement were: 1) a standing losses declaration in the form of additional and clearly visible data; 2) a stepwise phase-out of less efficient appliances ranking in certain draft energy label classes; and 3) a reduction of the European fleet consumption of appliances, as calculated by a notary system heaters. The first report published in year 2003 [CEC2003] and covering the year 2001 reported successful implementation by manufacturers.

The **TVs and VCRs standby losses** unilateral agreement was signed in 1997 by 16 companies and notified to the competition authorities by the consumer electronic trade association (at the time EACEM, now EICTA). Manufacturers agreed that the company sales-weighted average would be progressively reduced towards 3W by 2009. The target refers to the company *sales-weighted* TVs and VCRs stand-by consumption. Models with standby consumption over 10 W were to be phased out. In 2003 already sale-weighted average power consumption of 2.21 W and 3.53 W was achieved for TVs and VCRs respectively.

In 2003 EICTA (the European Industry Association for Information Systems, Communication Technologies and Consumer Electronics) submitted to the European Commission a new Self Commitment (unilateral commitment), signed by the a large number of the their member companies, to reduce the energy consumption of consumer electronics by continuously seeking to improve the energy performance per appliance. According to the new EICTA unilateral commitment the following targets for CRT TVs, non-CRT TVs and DVD' players were established:

1. For Analogue CRT based television receivers: Achieve a sales weighted average of 3,0W standby passive in 2005 with the target for new chassis of analogue TVs for 2005 is 1,0W;
 - Achieve maximum power consumption in standby passive to 1W by 2007;
 - Improve the sales-weighted energy efficiency index by a target of 10%, with a minimum of 5%, improvement in energy efficiency by 2007, with a longer-term objective of achieving a target of 15%, with a minimum of 10%, improvement in energy efficiency by 2010.
 - For all new models introduced after the 1st of June 2004 manufacturers will provide information on the power consumption of the equipment in the ON, standby modes and estimated annual energy consumption (kWh to potential purchasers on, or alongside, the product at the point of sale.

²⁹ CECED Voluntary Commitment on Reducing Energy Consumption of Household Washing machines –September 1997, downloadable from www.cecled.org

³⁰ This is not an officially recognised class under the EU labelling scheme.

³¹ See CECED press release on 21 March 2007, "Top executives Discontinue Voluntary Energy Efficiency Agreements for Large Appliances", downloadable from <http://www.cecled.org>.

2. For non-CRT based analogue television receivers:

- Achieve a sales weighted average of 3,0W, for power consumption in standby passive by 2005;
- Set maximum power consumption in standby passive to 1,0W by 2007.
- For all new models introduced after the 1st of June 2004 manufacturers will provide information on the power consumption of the equipment in the ON, standby modes and estimated annual energy consumption (kWh to potential purchasers on, or alongside, the product at the point of sale.

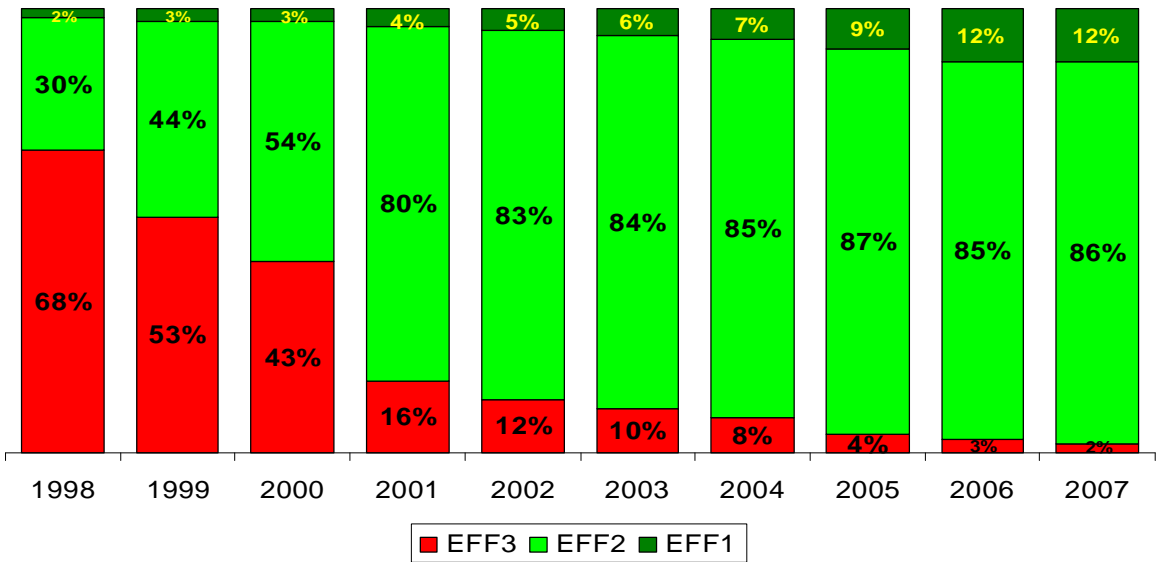
3. For DVD stand alone players:

- Achieve 1W for power consumption in standby passive by 2005;
- Report on an annual base the market share of DVD players, and the standby power consumption.

Finally, a voluntary agreement on **motors**, supported by the European Motor Manufacturers' Association (CEMEP) and the European Commission, was negotiated and signed in 1999 by 36 motor manufacturers representing 80% of the European production of standard motors. The unilateral motor agreement is based on a new system of efficiency classification: motors are divided into 3 categories, according to their efficiency with EFF 1 being the high efficiency motors, the EFF2 the medium efficiency motors and EFF 3 the low efficiency motors. The agreement goal has been to reduce the market share of motors in the lower efficiency class by 50% of 1998 levels. By 2007 EFF3 motors (new sales) represented only 2% of the market and EFF1 motors represented 12% of the sales, double the share in 2004 (figure 45). The motor sale and the relative efficiency classification have been monitored through the CEMEP unilateral agreement, which has provided sales data for the most recent years on 4 and 2-poles three-phase industrial motors in the power range 1 to 90 kW. These are the motors responsible for the largest share of energy consumption, which are sold in large numbers.

Through the unilateral commitment described above, CEMEP manufacturers almost phased out the low efficiency motors (class EFF 3)³².

Figure 1. Change of market share among the three motor efficiency classes (Source CEMEP)



³² The European Motor Classification Scheme at: <http://re.jrc.ec.europa.eu/energyefficiency/motorchallenge/tools.htm>

There is a new designation of the energy efficiency class, which consists of the letters “IE” (short for “International Energy Efficiency Class”), directly followed by a numeral representing the classification. Four efficiency classes are defined:

- IE4 – Super Premium
- IE3 – Premium efficiency
- IE2 – High efficiency (equiv EFF1)
- IE1 – Standard efficiency (equiv. EFF2)

GreenLight, Green Building and Motor Challenge voluntary programs

To convince end-users to adopt efficient lighting technologies and systems and achieve a long lasting market transformation, the European Commission launched in 2000 the European **GreenLight Programme**. It has been designed to promote energy efficiency in non-residential lighting, based on a voluntary participation. It aims to stimulate investment in efficient lighting in a visible manner. The GreenLight Programme is managed by the Joint Research Centre of the European Commission.

Any European public or private organisation can join the GreenLight Programme as a GreenLight Partner or as a GreenLight Endorser. Partner organisations commit themselves to upgrading the lighting system in their existing facilities or to install best available efficient lighting systems in their new buildings, in case the energy savings justify such investments and the lighting quality is maintained or improved. Endorser organisations are promoting the GreenLight Programme to potential Partners. They are expanding the network of Partners with each new applicant, as well as providing assistance to Partners throughout the application process and foremost in the implementation of the energy saving measures. The benefit of Partner and Endorser organisations in joining the GreenLight Programme is a wide public recognition for their efforts to improve lighting energy efficiency within their organisation.

Accepted Partners have to report to the Joint Research Centre on their savings, before and/or after implementing such saving measures. Endorsers have to submit a promotion plan as part of their application, detailing the specific actions they will take to promote the GreenLight Programme to potential Partners. Endorsers are expected to submit a promotion plan each year. The network of GreenLight Partners has been continuously expanding reaching 519 Partners by the end of 2008. The new GreenLight gave an impetus to the promotion of the GreenLight Programme. It was launched in 2006 aiming to expand the GreenLight Programme to the New Member States of the European Union.

In total final energy, Partners saved 241 GWh/year by the end of 2008 which corresponds to a saving of around 24 million EUR in running costs. One GreenLight Partner saved 689 MWh/year on the average, or 35.99% compared to the level of energy consumption before introducing energy saving measures.

In 2005 the European Commission launched the **GreenBuilding Programme**, which aims at improving the energy efficiency of existing as well as newly constructed non-residential buildings in Europe on a voluntary basis. Building owners from different sectors are participating in the programme e.g. public authorities with schools, hospitals or swimming halls, companies from the services and industry sectors with office buildings, sport centres and hotels.

To become GreenBuilding Partner, building owners perform an energy audit at their premises and formulate an action plan. By applying they agree to reduce their primary energy demand of the building by 25% (if economically viable) and to report the results of the renovation measures. Since January 2005, 13 organisations from 10 European countries have been implementing a two-year pilot phase; these organisations are called National

Contact Point (NCP). The NCP assists building owners in this process by providing guidelines for energy saving renovation, and a website in national language with an inventory of best-practices. Other private and public organisations may help potential Partners join the programme as Endorsers. Besides reducing energy as well as operational costs, other reasons for building owners to join GreenBuilding are public recognition for the participating organisations, practical help by the NCP, public commitment for environmentally friendly behaviour, and reduction of CO₂-emissions

As of December 2009, 169 GreenBuilding Partner statuses have been awarded, covering 283 buildings and leading to a reduction of primary energy of about 304 GWh/year.

The **Motor Challenge Programme** is a European Commission initiative to aid industrial companies in improving the energy efficiency of their electric Motor Driven Systems. The Challenge focuses on Compressed Air, Fan and Pump systems, for which it has been demonstrated that there exists a large technical and economic potential for energy savings.

Any enterprise planning to contribute to the Motor Challenge Programme objectives can participate. Companies that use Motor Driven Systems can request "Partner" status. Companies that supply Motor Driven Systems may become "Endorsers". Partners will be aided in reducing operating expenses, through profitable, cost effective measures. Furthermore, they will receive public recognition for their contribution to achieving the objectives of the European Union's energy policy. The core of the programme is an **Action Plan**, by which a Challenge Partner commits to undertaking specific measures to reduce energy consumption. The Partner company determines which production sites, and which types of systems, are covered by the commitment. The scope of the commitment is flexible, and can be limited to a single shop, or may include all of the company's European production sites. Challenge Partners will receive aid, advice and technical assistance from the Commission and from participating National Energy Agencies in formulating and carrying out their Action Plan.

Suppliers of equipment and services related to Motor Driven Systems may participate in promoting the Motor Challenge, for instance by assisting Partners in defining and carrying out their Action Plan. Such companies are encouraged to register as Motor Challenge Endorsers. Endorsers get public acknowledgement for their efforts to support the Motor Challenge Programme. The final energy savings delivered by the Motor Challenge Program amount to 183 GWh/y.

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