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**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND
THE COUNCIL**

Progress report on the application of Directive 2006/32/EC on energy end-use efficiency and energy services and on the application of Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market.

{SWD(2013) 541 final}

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INTRODUCTION

Directive 2006/32/EC¹ on energy end-use efficiency and energy services (the Energy Services Directive or the ESD) aims at making the end use of energy more economic and efficient by establishing indicative targets, incentives and the institutional, financial and legal frameworks needed to eliminate market barriers and imperfections which prevent efficient end use of energy. It also aims at creating the conditions for the development and promotion of a market for energy services and for the delivery of energy-saving programmes and other measures aimed at improving end-use energy efficiency.

The Energy Services Directive applies to the distribution and retail sale of energy, the delivery of measures to improve end-use energy efficiency, with the exception of activities included in the EU Emissions Trading Scheme (ETS) and, to a certain extent, the armed forces. It targets the retail sale, supply and distribution of extensive grid-based energy carriers, such as electricity and natural gas as well as other types of energy such as district heating, heating oil, coal and lignite, forestry and agricultural energy products and transport fuels.

In accordance with Article 14(2) of the ESD, the Member States were required to prepare a second Energy Efficiency Action Plan (EEAP) and to notify it to the Commission no later than 30 June 2011².

On the basis of the EEAPs, Article 14(5) of the ESD required the Commission to assess the extent to which Member States had made progress towards achieving their national indicative energy saving targets

This Report, therefore, concludes the Commission's assessment and reporting on the second EEAPs in response to its obligation under Article 14(5) of the ESD. It comes later than foreseen as not all Member States had submitted their EEAPs in accordance with the deadline set out in the ESD.

High-efficiency cogeneration offers considerable potential to achieve energy savings in the EU, as the heat produced by power generation is not wasted but also used. This potential has not yet been fully realised. Directive 2004/8/EC³ on the promotion of cogeneration based on a useful heat demand in the internal energy market (the CHP Directive or the Cogeneration Directive) aims to facilitate the installation and operation of cogeneration facilities in order to save energy and combat climate change. The CHP Directive should, in the short term, make it possible to

¹ OJ L 114, 27.4.2006, p.64

² Although Croatia submitted an EEAP in April 2013, it was not required to do so under the ESD as the obligation occurred before Croatia's accession to the EU.

³ OJ L 52, 21.2.2004, P. 50

consolidate existing cogeneration installations and promote new plants, and in the longer term, create the necessary framework for high efficiency cogeneration to reduce emissions.

In accordance with Article 10 of the CHP Directive, Member States were required to publish a report with the results of the analysis and evaluations carried out in relation to the guarantee of origin, to the national potential for high-efficiency cogeneration and to the existing legislative and regulatory framework related to cogeneration.

In accordance with Article 11 of the CHP Directive, the Commission is required to report periodically on the progress towards the CHP Directive's goals. This Report complies with this requirement. It comes later than foreseen as not all Member States had submitted their reports in accordance with the deadline set out in the CHP Directive.

It should be noted that the ESD and the CHP Directives will be almost entirely repealed by the Energy Efficiency Directive (the 'EED')⁴ with effect from 5 June 2014. However, the obligation to set a target under Article 4 of the ESD will not be repealed until 1 January 2017.

This Report is accompanied by a Staff Working Document (SWD(2013) 541 final), which gives details of the application of both the Energy Services Directive and the Cogeneration Directive by the Member States, and evaluates progress in energy efficiency in energy supply and in end-use consumption. A detailed analysis of each Member States' EEAP is also given.

IMPLEMENTING DIRECTIVE 2006/32/EC ON ENERGY END-USE EFFICIENCY AND ENERGY SERVICES

The Energy Services Directive required Member States to fix and aim to achieve a national indicative energy savings target for 2016 of at least 9% of final energy⁵. Most of its provisions have been replaced by more precisely detailed provisions in the EED. However, the requirements related to the 9% target will not be repealed until 2017. Although the calculations and methodology are very different, the ESD target should be seen as a step towards the EU achieving its more ambitious target of a 20% reduction in energy consumption by 2020.

The Directive requires that Member States report on their main adopted and planned energy efficiency measures in their EEAPs. In general, taking into account their comprehensiveness, level of description of national policy measures and coverage of key sectors, the overall quality of the second EEAPs submitted by the Member States in 2011-2012 under the framework of the ESD was much higher than that of the first EEAPs, which were submitted in 2007-2008. This was also reflected in the energy savings expected to be achieved due to the implementation of new measures included in the second EEAPs.

As the focus of the ESD is on savings in energy end-use and energy services – excluding, as specified, most energy efficiency measures on the supply side and measures to improve the energy efficiency of participants in the ETS – many of the second EEAPs provide details of activities undertaken or planned to improve the energy efficiency of energy supply. Moreover the EEAPs describe a variety of energy efficiency improvement measures beyond energy services.

⁴ Directive 2012/27/EU on energy efficiency, OJ L 315, 14.11.2012, p.1

⁵ Annex I to the Directive specifies that Member States should calculate their target referring to their average annual final inland energy consumption for the most recent five year period previous to the implementation of this Directive.

Buildings represent the largest single share of energy savings potential in the EU and achieving energy efficiency improvements in the sector is a priority target for the Member States. Almost all the Member States reported, in their second EEAPs, measures covering both new and existing buildings as well as residential and tertiary buildings⁶. The savings achieved by building regulations and actions make up a significant part of total national savings, with some including early savings resulting from regulations implemented since 1995. As in the first reporting period, the residential sector is a key feature of the second EEAPs as well, with extensive building renovation programmes reported by 17 of the Member States.

Some Member States include in their savings calculations of the effects of specific EU legislation on energy efficiency, such as implementing regulations relating to Ecodesign and Energy labelling.

In terms of financing energy saving measures, the use of EU funds as well as revenues from the sale of Assigned Amount Units (AAUs) under the Kyoto Protocol have been reported by a number of Member States⁷. At the same time, efforts to increase the involvement of the private sector in the financing of energy efficiency improvements are on the rise throughout the EU.

The number of promising horizontal measures has increased from the first to the second reporting period. In line with this, energy savings obligations now form a key part of efforts to encourage accelerated rates of energy savings. Established white certificate schemes⁸ were reported as being already operational in five Member States. Two Member States report in their second EEAP the upcoming introduction of such schemes. Energy Services Companies ('ESCOs') remain a further key area of financing energy efficiency in the EU. In line with this, a number of Member States indicate the provision of model contracts for energy services, the introduction of legislation or the removal of legal barriers to open energy services in the public sector to ESCOs. At the same time, as it was observed in the first reporting period, many of the ESCO related measures reported contain little detail about concrete actions to be undertaken.

Total final energy savings for 2010 as declared by the Member States were approximately 59 Mtoe (million tonnes of oil equivalent). This figure is around 35% higher than the sum of the intermediate energy savings targets that had been set by the 27 Member States in their first EEAPs, which were submitted in 2008. Declared intermediate savings levels range from 1.8% of reference consumption in Lithuania to nearly 9% in Germany and Sweden where the ESD indicative target for 2016 has effectively been reached at the end of the intermediate period.

Total final energy savings of around 132 Mtoe are forecast for 2016⁹, well in excess of the 9% indicative target of approximately 89 Mtoe. Spain and Germany forecast the highest levels of savings, while four Member States quantify 2016 savings that are lower than 9% of their reference energy consumption. When comparing the savings figures of Member States, however, it is important to consider the methods used to calculate savings and not just the declared and forecast savings levels. A number of different approaches were used to quantify the savings. Accordingly, the numbers presented below in table 1 can only serve as a rough indicator of the

⁶ See section 3.2 of Accompanying SWD(2013) 541 final on Progress Report on energy efficiency in the European Union

⁷ See Section 4 of Accompanying SWD(2013) 541 final

⁸ These are certificates issued by independent certifying bodies confirming the energy savings claims of market actors as a consequence of energy efficiency improvement measures (Article 3(s) ESD)

⁹ See section 4.9 and table 10 of Accompanying SWD(2013) 541 final

actual EU saving impact. The national approaches are examined in more detail in the accompanying Staff Working Document.

As the above overview of progress in energy efficiency in the EU indicates, various positive developments occurred between the first and second round of reporting under the ESD. The widespread use of the guide and template provided by the Commission has contributed to the overall improved quality of the EEAPs. However, a number of Member States could improve their reporting even further by providing more detail on measures and their concrete implementation, as well as by clarifying methodologies used to quantify energy savings. The second round of reporting indicates that there is still space for improving information provision in the EEAPs to demonstrate whether and how Member States can reach the energy savings target.

Table 1: EEAP final energy saving targets and forecasts for 2016 and declared savings for 2010

Member State	2010 target final energy savings (<i>primary equivalent in italics</i>)		2010 declared final energy savings (<i>primary equivalent in italics</i>)		2016 forecast final energy savings (<i>primary equivalent in italics</i>)	
	Mtoe	% of reference consumption	Mtoe	% of reference consumption	Mtoe	% of reference consumption
Austria	0.428	2.0%	1.180	5.5%	1.874	8.8%
Belgium	0.789	3.0%	1.301	4.9%	2.985	11.4%
Bulgaria ¹⁰	0.209	3.0%	0.305	4.4%	1.066	15.3%
Cyprus ¹¹	<i>0.060</i>	3.3%	<i>0.066</i>	3.6%	<i>0.191</i>	10.4%
Czech Republic ¹²	0.355	1.8%	0.532	2.7%	1.596	8.2%
Denmark	0.449	3.0%	0.664	4.4%	1.285	8.6%
Estonia	0.061	2.3%	0.079	3.0%	0.213	8.1%
Finland	0.507	3.0%	1.040	6.1%	2.123	12.5%
France	5.000	3.8%	5.159	3.9%	18.000	13.5%
Germany	12.181	6.1%	17.937	9.0%	33.868	17.1%
Greece ¹³	0.439	2.8%	0.794	5.1%	1.415	9.0%
Hungary	0.152	1.0%	0.293	1.9%	1.371	9.0%
Ireland	<i>0.559</i>	4.5%	<i>0.523</i>	4.2%	<i>1.576</i>	12.6%
Italy	3.066	2.7%	4.102	3.6%	10.880	9.6%

¹⁰ 2016 figures for Bulgaria represent the bottom-up savings totals given in the EEAP.

¹¹ Figures for Cyprus, Ireland and the Netherlands are shown in Primary Energy Equivalent. As the ESD does not specifically define "primary" or "final" energy savings, the Member States have submitted figures based on their definitions.

¹² The Czech Republic does not clearly state intermediate savings achieved. The 2010 figure shown above is one third of the forecast figure for 2016.

¹³ To account for recessionary influences, Greece adjusted a very high interim savings figure given by top-down methods to have a more realistic range of likely savings achieved. The 2010 figure shown here represents the low end of the range. No clear forecast of energy savings in 2016 exists. The value shown assumes that the 9% indicative target is achieved.

Member State	2010 target final energy savings (<i>primary equivalent in italics</i>)		2010 declared final energy savings (<i>primary equivalent in italics</i>)		2016 forecast final energy savings (<i>primary equivalent in italics</i>)	
	Mtoe	% of reference consumption	Mtoe	% of reference consumption	Mtoe	% of reference consumption
Latvia	0.006	0.2%	0.294	8.8%	0.299	9.0%
Lithuania	0.054	1.5%	0.067	1.8%	0.341	9.4%
Luxembourg	0.045	2.7%	0.128	7.6%	0.238	14.1%
Malta	0.011	3.0%	0.014	3.8%	0.033	9.0%
The Netherlands	0.978	2.0%	2.278	4.7%	6.416	13.1%
Poland	1.021	2.0%	3.037	5.9%	5.779	11.3%
Portugal	0.344	1.9%	0.662	3.6%	2.240	12.2%
Romania ¹⁴	0.940	3.0%	2.222	7.1%	2.800	9.0%
Slovakia	0.224	3.0%	0.668	9.0%	0.671	9.0%
Slovenia	0.102	2.5%	0.101	2.5%	0.591	14.5%
Spain ¹⁵	2.179	3.0%	4.720	6.5%	13.126	18.1%
Sweden	2.003	6.3%	2.846	9.0%	4.626	14.6%
The United Kingdom	11.737	9.0%	8.547	6.6%	17.816	13.7%

The levels of overall achieved and forecast savings in the second EEAPs are higher than other indicators of energy efficiency improvement rates. According to the second EEAPs, Member States that use mostly top-down indicators declare an energy efficiency improvement of 6.6% for the 3-year intermediate period (2007-2010), or an average annual improvement of over 2.1% of reference consumption. This figure is in contrast with the average rate of final energy intensity reduction of around 1.2% recorded for the years 2000-2009 by the Odyssee project¹⁶. The significant increase in the rate of annual improvement apparent from the EEAPs may not be fully accounted for by an increase in policy activity, but also by additional structural and statistical factors as well as data inconsistencies and overlaps when aggregating the impacts of various national measures.

Member States using mostly bottom-up or measure-specific methods to determine their declared savings values show savings of 5.1% of reference energy consumption up to 2010. This figure also looks high considering that, unlike the top-down methods, bottom-up figures should exclude autonomous savings, although they do incorporate some early savings. . There is also a certain risk of double-counting where the same kWh saved may have been triggered by several policy measures.

¹⁴ No savings forecast given for 2016 for Romania. 2016 figure shown represents the 9% ESD indicative target.

¹⁵ The calculation of the 9% ESD target for Spain is unclear from the EEAP.

¹⁶ EU-funded project on energy efficiency indicators (<http://www.odyssee-indicators.org/>) using top-down methodologies similar to the methodologies used in the second EEAPs by many Member States.

Table 2: Overview of supply-side measures contained in the second EEAP¹⁷

Member State	Measures addressing electrical transmission and distribution losses	Measures promoting high efficiency cogeneration	Measures prioritising other high efficiency generation plants, including wind, PV	Measures to encourage district heating or improve its efficiency	Measures to promote load management	Measures to promote or develop smart grids	Measures addressing the efficiency of the supply of oil and gas	Voluntary Agreements encouraging supply-side savings	Measures aimed at promoting greater competition among suppliers
AT		X		X					
BE		X ¹⁸							
BG	X	X		X		X			
CY	X	X	X						
CZ		X	X	X					
DK	X			X ¹⁹			X	X	
EE	X	X		X			X		X
FI								X	
FR						X			
DE		X ²⁰							X
GR	X	X	X	X					
HU				X					
IE	X		X		X	X		X	X
IT	X	X	X			X			
LT	X	X	X	X		X	X		
LV		X							
LU		X							
MT	X	X				X			
NL		X							
PL	X			X		X			
PT		X							
RO									
SK		X							
SI		X	X	X		X		X	
ES		X	X						
SE				X		X			
UK						X			

¹⁷ The table is of a descriptive nature only to show that Member States have been taking different types of measures in their second EEAPs. The number of crosses is not linked to the comprehensiveness or quality of the measures included in the second EEAP.

¹⁸ Separate measures for Wallonia, Flanders and Brussels regions.

¹⁹ Measure or strategy mentioned but no detail provided.

²⁰ CHP measures described in the EEAP focus mainly on end-use or micro-CHP installations.

IMPLEMENTING DIRECTIVE 2004/8/EC ON THE PROMOTION OF COGENERATION

High-efficiency cogeneration (defined as the simultaneous generation in one process of thermal energy and electrical and/or mechanical energy) has significant potential in terms of saving energy, but is largely untapped within the EU. The objective of the CHP Directive is therefore to establish a transparent common framework to promote and facilitate the installation of cogeneration plants. In the short term, the Directive should make it possible to consolidate existing cogeneration installations and promote new plants. In the medium to long term, the Directive should create the necessary framework for high efficiency cogeneration to reduce emissions of CO₂ and other substances and to contribute to sustainable development.

Under the CHP Directive Member States were required to analyse their national potential for high-efficiency cogeneration, to evaluate barriers and administrative frameworks and to assess the reliability of the guarantees of origin system (Article 10(1) of the CHP Directive). Every four years starting from 21 February 2007, Member States had to evaluate the progress made in increasing the share of high-efficiency cogeneration (CHP) in energy provision. Member States had to publish 2nd national progress reports by 11 October 2011, and the Commission is required to review the application of the CHP Directive on the basis of those reports. All Member States complied with the obligation to analyse their national cogeneration potential and the barriers to achieve this potential and to evaluate their administrative frameworks, including the guarantees of origin system. All Member States have also submitted the first and the second progress reports as required under the CHP Directive although with some delays. To facilitate reporting and to provide comparable information for evaluation, the Commission provided non-compulsory templates and questionnaires to Member States, but not all Member States used these questionnaires or the templates or filled them out completely. This has led to divergences in quality, completeness and methodology. Information provided in the national reports about progress in increasing the share of high-efficiency cogeneration is therefore often not comparable and of varying degrees of detail and comprehensiveness. This is also true of the national analyses of potential.

Although the CHP Directive has been transposed into national legislation, in some Member States the guarantees of origin system or the calculation methodologies for the quantity of electricity from high-efficiency cogeneration were still not fully operational in 2010 or little used in practice. National grid system rules regarding connection and access to the grid for high-efficiency cogeneration have been implemented in various ways and show great divergence. Although there has been progress in making grid rules objective and transparent, connection scheduling and charging conditions are often still complex and burdensome, especially for distributed cogeneration.

Member States also had an obligation to assess barriers to cogeneration. Member States identified fuel prices, heating and cooling demand, the complexity of the law, lack of promotion and access rules to electricity grids as the most common barriers to cogeneration. Other important barriers were economic risk, uncertainties due to the Emissions Trading System, the lack of (heat) infrastructure and financial resources, the lack of awareness and immaturity of certain technologies.

In their second progress reports, most Member States provided information on their support schemes for cogeneration, although this information was not legally required. Feed-in tariffs, price premiums or a guaranteed purchase price for cogeneration were the most frequent form of support in the reporting period (up to 2010), used in seventeen Member States. These price support mechanisms were coupled with capital grants in fifteen Member States. Energy and business tax exemptions and accelerated fiscal allowances were also used in many Member States. Some Member States combined several support mechanisms, such as certificates coupled with quota systems (four Member States). The scope, conditions and duration of national support schemes varied greatly. Support schemes often addressed a specific segment of cogeneration, e.g. selected by fuel, such as biomass, or capacity, e.g. below 10 MW²¹.

Progress in increasing the share of high-efficiency cogeneration remained limited since the entry into force of the CHP Directive in 2004. The share of CHP in gross electricity generation in the EU-27 increased from 10.5% in 2004 to 11.2% in 2011. In absolute terms, electricity generation from CHP has increased by 38 TWh²²: from 337 TWh in 2004 to 375 TWh in 2011.

On the basis of the national reports submitted pursuant to Article 10 of the CHP Directive, which reflect the situation until 2010 with a focus on the period from 2008 onwards, the overall evolution of electricity production from high-efficiency cogeneration show a great variety across Member States.

There was a slight decline in total generation from CHP in 2009, especially in industry, probably due to the economic downturn, followed by a rebound in 2010. From 2008 to 2009, electrical capacity has increased but electricity production decreased, showing an underutilisation of capacity. Heat production from cogeneration is stabilised with no decline registered, and overall, there has been steady growth since 2004. A moderate increase is primarily due to the increase in district heating in the residential, commercial and services sector.

The share of cogeneration in (thermal) heat production varies from over 30% in Sweden (40%), Bulgaria (33%), Czech Republic (33%) and Estonia (31%) to below 1% in Greece, Malta and Cyprus. There has been a consistent increase in the use of natural gas in this period from 39% to 48% as fuel for cogeneration, while coal and lignite have shown a declining trend from 35% to 21%. Biomass and biogas show an overall growing trend from 9% in 2005 to 15% in 2010. The most common technology is still steam condensing extraction turbine but this is steadily decreasing from 40% in 2005 to 36% in 2010, while the share of gas combined cycle turbines is growing (from 23% in 2005 to 29% in 2010). Overall while the share of high-efficiency cogeneration in the electricity market has increased, progress remained limited, reaching only 12% in the share of electricity production instead of the economic potential of 21% identified by the Member States in their national potential analysis²³.

CONCLUSION

In practice implementation of the ESD has resulted, above all, in measures targeting energy end use, for example, programmes to refurbish and renovate buildings. Member States' EEAPs

²¹ Megawatts.

²² Terawatt hours.

²³ Annex X to the Impact Assessment for the Energy Efficiency Directive, (SEC(2011) 779 final)

indicate high levels of final energy savings achieved up to 2010 and suggest that the 9% indicative target for 2016 will be comfortably exceeded by most Member States. This is encouraging and shows that Member States' commitment pays off in terms of energy saving. The progress achieved should be maintained in views of achieving the EU's ambitious 2020 energy savings target of 20%, and the concrete transposition and implementation of the EED, a key instrument to achieving that target.

In terms of the CHP Directive, the overall evolution of electricity production from high-efficiency cogeneration shows a moderate increase primarily due to the increase in district heating in the residential, commercial and services sectors. There has been steady growth in heat production from cogeneration since 2004.

Proposals for additional measures or amendments to either the ESD or CHP Directive are not considered appropriate at this time. This is because both Directives will be repealed and have been replaced by the EED, which has taken over their provisions and strengthened the obligations placed upon the Member States.