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COMMISSION OF THE EUROPEAN COMMUNITIES

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COM(2008) 772 final

**COMMUNICATION FROM THE COMMISSION**

**Energy efficiency: delivering the 20% target**

## COMMUNICATION FROM THE COMMISSION

### Energy efficiency: delivering the 20% target

#### EXECUTIVE SUMMARY

European leaders committed themselves to reduce primary energy consumption by 20% compared to projections for 2020. Energy efficiency is the most cost-effective way of reducing energy consumption while maintaining an equivalent level of economic activity. Improving energy efficiency also addresses the key energy challenges of climate change, energy security and competitiveness.

Community legislation on energy efficiency has been designed to considerably improve energy efficiency in key energy-consuming sectors. However, current energy efficiency legislation alone will not deliver sufficient energy savings to meet the 20% saving objective. Main obstacles to energy efficiency improvements are the poor implementation of existing legislation, the lack of consumer awareness and the absence of adequate structures to trigger essential investments in and market uptake of energy efficient buildings, products and services. The assessment of national energy efficiency action plans shows that there is a gap between the Member States political commitment to energy efficiency and their actions. Member States need to implement more swiftly and effectively energy efficiency legislation. New instruments must be developed to further enhance energy efficiency.

The Commission proposes to reinforce the key energy efficiency legislation on buildings and energy-using products. The provisions of the Energy Performance of Buildings Directive will be strengthened to apply to more buildings, and to enhance the role of energy performance certificates and inspection reports for heating and air-conditioning systems. The Energy Labelling Directive will be revised to be applied to additional energy-using and energy-related products, and not to household appliances alone. A Directive containing a new labelling scheme for tyres is proposed to promote the market take-up of fuel efficient tyres. For further improvements of energy efficiency in energy supply, the Commission proposes detailed guidelines to facilitate the uptake of electricity generation from high energy efficiency cogeneration installations. A Communication on cogeneration is presented. To address the lack of necessary investments, new financing initiatives for energy efficiency, such as an EU Sustainable Energy Financing Initiative, are already considered as they would also contribute to shield the EU economy against deteriorated financial conditions.

The European Council has underlined the importance of the European framework for energy efficiency policies and measures, i.e. the 2006 European Action Plan for Energy Efficiency, by urging the Commission and Member States to speed up its implementation and consider its possible revision. To this end, the Commission will evaluate this Action Plan in 2009 with a view to prepare a revised Plan. It could reinforce incentives to leverage energy efficiency improvements and will take into account the crucial role cities could play in reducing energy consumption, e.g. by further promoting local networks like the Covenant of Mayors. Internationally, the

Community will continue to promote energy efficiency through institutionalized dialogues and partnerships.

## 1. THE RISK OF FALLING SHORT

Energy saving is the EU's most immediate and cost-effective way of addressing the key energy challenges of sustainability, security of supply and competitiveness as set out in the strategic objectives of the 'Energy Policy for Europe'.<sup>1</sup> EU leaders have stressed the need to increase energy efficiency as part of the '20-20-20' goals for 2020: saving 20% of the EU's primary energy consumption<sup>2</sup>, a binding target of 20% reduction of greenhouse gas emissions and 20% renewable energies by 2020. Both greenhouse gas emission reduction and the renewable targets trigger energy efficiency improvements and, conversely, ambitious action on energy efficiency will greatly help achieve the EU's climate objective, notably under the effort sharing decision<sup>3</sup>.

If the saving objective of 20% is met, the EU would not only use about 400 Mtoe less primary energy but it would also avoid the construction of about 1000 coal power units or half a million wind turbines.<sup>4</sup> CO<sub>2</sub> emissions reduction would be about 860 Mt.<sup>5</sup>

'Negawatthours', or avoided energy consumption through savings, have become the single most important energy resource. For example, the annual final energy use would have increased by 115 Mtoe or 11% over the 1997-2006 period had there been no energy efficiency improvements.<sup>6</sup> This is one third of all crude oil imports into the EU-27 in 2006. Energy saving is a crucial asset to ensure EU's security of supply.

Indeed, on current implementation trends by Member States, it is clear that our saving objective by 2020 is in serious danger of not being met. *Annex 1* gives a quantitative evaluation of the expected impact of some specific energy efficiency legislation and measures when fully implemented. The Member States are implementing the legislation and it is too early to assess the full impacts. But the first hand information on the evolution and the implementation as well as other indicators (see section 2) suggest that the energy saving potential is not being realised fast enough. These measures should achieve energy savings of about 13% by 2020 if properly implemented by Member States. Even if this represents a major achievement, **this falls far short of what is needed.**

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<sup>1</sup> COM(2007) 1 final.

<sup>2</sup> Council of the European Union, Presidency Conclusions 8/9 March 2007 (7224/1/07).

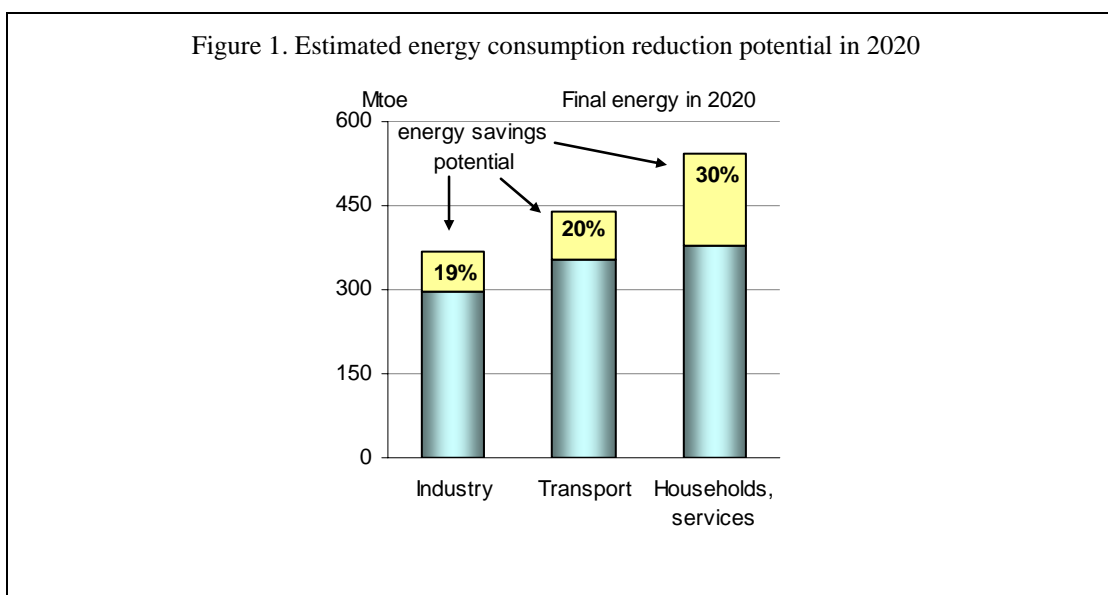
<sup>3</sup> COM(2008) 17.

<sup>4</sup> Based on the assumption that each power plant unit is 600 MW, operating 7000 hours/year; for wind: average turbine size of 4 MW in 2020, operating 2300 h/year.

<sup>5</sup> An implicit emission factor for 2020, derived as the ratio of primary energy consumption to CO<sub>2</sub> emission, has been used. The implicit emission factor is based on the Primes baseline (2007 update), available at: [http://ec.europa.eu/dgs/energy\\_transport/figures/trends\\_2030\\_update\\_2007/index\\_en.htm](http://ec.europa.eu/dgs/energy_transport/figures/trends_2030_update_2007/index_en.htm), and is dependent on the fuel mix in 2020.

<sup>6</sup> Odyssee project, 115 Mtoe final energy is about 180 Mtoe primary energy.

Recent studies indicate that the opportunities for energy savings still remain significant, as shown in Figure 1<sup>7</sup>.



Many barriers to achieving energy efficiency exist. *Annex 2* gives an overview of the main drivers and barriers in relation to bringing about energy efficiency improvements. Cross-sectoral barriers include incomplete implementation of EU energy efficiency legislation, insufficient access to financing and low awareness of the benefits of energy saving. In transport, insufficient infrastructure facilitating energy efficiency and limited commitment from the sector need improvement. For the industry, low awareness of the potential benefits and high up-front costs present clear obstacles. The current state of the financial markets does not help to improve access to financing in the short term.

## 2. WHAT HAS BEEN DONE SO FAR

### 2.1 The importance of energy efficiency

Energy efficiency is highly relevant for EU citizens. More people feel the effect of higher energy bills, as do businesses. Reducing energy consumption is the best sustainable long-term response. Energy saving benefits per year can easily amount to over €1000 per household: €600 thereof due to lower energy bills and the remainder due to cost-savings elsewhere.<sup>8</sup> However, up-front costs remain a challenge. Since most renovations have a long lifetime, the added cost of making such a renovation energy efficient will itself pay back much faster than the lifetime of the renovation itself. A recent example from France shows that insulating the roof of an average house will save so much heating oil that the measure is paid back in 3 years. More substantial renovations (e.g. insulation of walls, better windows), have longer pay back times.

<sup>7</sup> Study on Energy Savings Potentials in EU Member States, Candidate Countries and EEA Countries. Fraunhofer ISI *et al*; preliminary results.

<sup>8</sup> Based on the mean consumption expenditure per household in 2005 (i.e. 1192 purchasing power standard (pps) for electricity, gas and other fuels, and 1121 pps for transport) with a 20% increase factor by 2020.

Energy efficiency is beneficial to the EU economy as a whole and even more for local development.<sup>9</sup> The direct benefits of energy savings if the 20% energy reduction objective is met in 2020 are expected to be €20 billion per year.<sup>10</sup> The indirect economic benefits are much higher. Energy efficient products and materials, and energy services constitute a profitable market, also for export. It is an opportunity for European business to lead innovation and creates new jobs, often with local small and medium-sized companies (SMEs) as investments in energy efficiency are mostly related to small-scale renovation projects.

## 2.2 EU tools for achieving energy efficiency

Energy efficiency is both the result of policy developments and the application of concrete measures. Technology development creates the basis and environmental legislation has contributed much, especially the Emission Trading Scheme and transport emissions policies. Taxation and other fiscal measures such as State aid and recent industry policy tools also provide strong incentives for markets to realise cost-effective energy savings. It is important to continue relying on these efficient instruments, especially in the current difficult economic situation.

There are **five pillars to the EU's specific energy efficiency policy**:

- (1) the general policy framework and the actions taken under the European Energy Efficiency Action Plan;
- (2) the National Energy Efficiency Action Plans based on the framework Directive on Energy Services<sup>11</sup>;
- (3) the legal framework for the most important consumption sector - buildings - and energy consuming products;
- (4) flanking policy instruments such as targeted financing, provision of information and networks like the Covenant of Mayors and Sustainable Energy Europe; and
- (5) international collaboration on energy efficiency.

With the Green Paper on energy efficiency, the Commission initiated a debate on efficient ways of using energy.<sup>12</sup> The potential to save 20% of primary energy consumption by 2020 in a cost-effective way was recognised. To achieve this, a comprehensive **Energy Efficiency Action Plan** was developed and adopted in 2006.<sup>13</sup> It identifies six key areas<sup>14</sup> with the highest potential for energy saving and it proposes 85 actions and measures to be taken at EU and national level. Among them,

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<sup>9</sup> Conclusions of the European Council 22 and 23 March 2005, 7619/05, CONCL 1.

<sup>10</sup> COM(2006) 545 final. Calculated savings are 390 Mtoe; at USD 96/barrel net of taxes this equals €20 billion.

<sup>11</sup> Directive 2006/32/EC (OJ L 114, p. 6).

<sup>12</sup> COM(2005)265 final; 22.6.2005.

<sup>13</sup> COM(2006)545 final.

<sup>14</sup> (1) Energy performance requirements for products, buildings and services, (2) energy transformation, (3) transport, (4) financing and pricing, (5) energy behaviour, and (6) international partnerships.

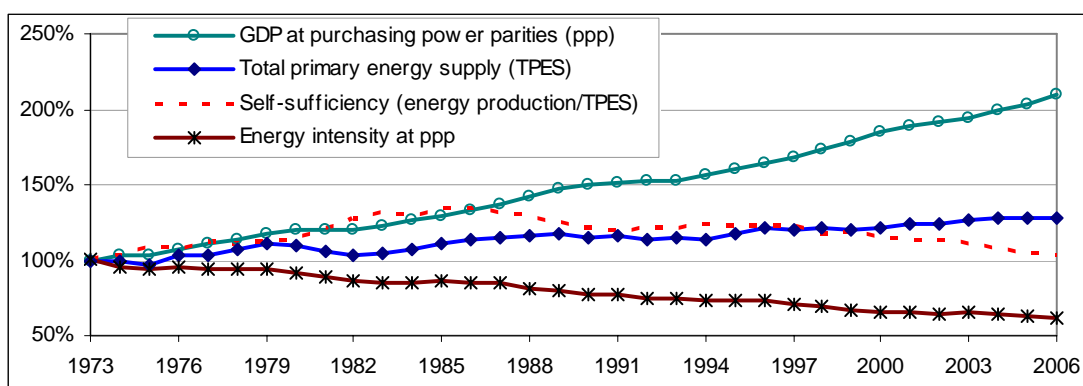
ten priority actions have been identified and all of these have advanced well.<sup>15</sup> The implementation of the Action Plan is ongoing and should be completed by 2012. One third of the actions have been completed but the remainder still need active commitment both at EU and national level (see also section 4.1 below).

Smart metering, labelling and informative billing based on actual consumption are key to help individual consumers save energy. The Energy Services Directive<sup>16</sup> requires Member States to ensure that competitively-priced meters reflect actual energy consumption. Energy efficiency is also one of the key aspects in the work of the Citizens' Energy Forum<sup>17</sup>, a regulatory forum, recently launched by the Commission.

## 2.3 Development at EU level

The last decades have seen rapid economic growth which increased our energy needs (see Figure 2 below). While national wealth has more than doubled since the first oil crisis of the 1970s, the energy to support this growth increased only by 30%. Unfortunately, the rate of energy efficiency gains<sup>18</sup> started to slow down in the 1990s and have reduced further in the current decade. Since the 1980s the dependency on energy imports is on the rise again. The EU depends on imports for over half of its energy needs.

Figure 2. Development of some main indicators for Europe (1973 = 100%)<sup>19</sup>



Within the EU, energy efficiency policies and measures implemented since 1997 together with 'normal' technological progress combined, have contributed to

<sup>15</sup> Examples of priority actions: Appliance and equipment labelling, and the setting of minimum energy performance standards, adoption of building performance requirements and very low energy buildings, making power generation and distribution more efficient, achieving fuel efficiency of cars, facilitating appropriate financing of energy efficiency investments, coherent use of taxation and energy efficiency in built-up areas.

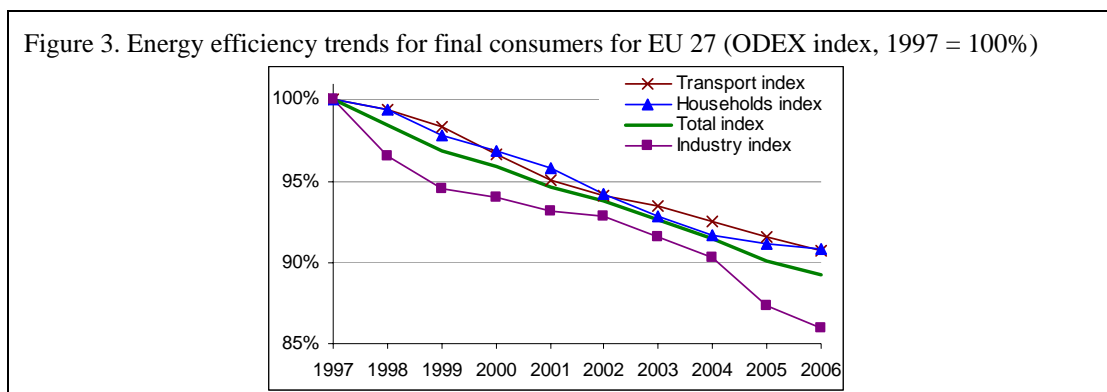
<sup>16</sup> Directive 2006/32/EC, Article 13.

<sup>17</sup> The first meeting of the Citizens' Energy Forum took place in London on 27-28 October 2008.

<sup>18</sup> Energy efficiency gains are measured in energy intensity i.e. energy used per unit produced. More energy efficiency will reduce energy consumption per performance, service or good, but it does not necessarily equal energy saving as we tend to heat and cool more houses, drive more kilometres and use more electrical devices.

<sup>19</sup> Due to data limitation the figure includes all EU-27 except the three Baltic States and Slovenia. Unless otherwise stated, Eurostat data is used.

improving final energy efficiency on average by 1.3% per year between 1997 and 2006<sup>20</sup>. Without these gains, final energy consumption would have been 11% higher in 2006. Industry is the sector which achieved the largest energy efficiency improvement. It is 24% more energy efficient than in 1997. Energy efficiency in transport and households has improved only by 9%, i.e. 1.1% per year. See figure 3 below.



There is a lot of room for improvement of energy generation and transmission efficiency. Reduced final energy consumption means even greater up-stream savings: if a final consumer uses 1kWh of electricity less, 2.5 kWh of primary energy are saved. This also means that any saving of final energy has a much higher monetary value than the same amount of saved primary energy.

## 2.4 Development at national level

Community legislation on energy efficiency is the backbone for the national portfolios, as it provides the framework by defining legal obligations in a number of Directives and leaves the implementation to Member States. **This implementation is not progressing well enough:** transposition has been slow and enforcement at national level uneven. Member States are beginning to put in place financing schemes but they are often fragmented. There are also other obstacles such as lack of information, administrative barriers and insufficient qualified workers.

The Energy Services Directive<sup>21</sup> gives a general framework for many saving actions including an indicative energy saving target.<sup>22</sup> The Directive applies to energy distributors, distribution system operators, retail energy sales companies, and to all energy users except those covered by the Emission Trading Scheme.

Due to the wide scope of the Directive and the diversity in the Member States of the development of energy infrastructures, Member States have implemented and applied the Directive in very different ways. The Commission is currently assessing the national implementing measures.

<sup>20</sup> Basis: ODEX. It is an alternative index to overall energy intensity used by the ODYSSEE project. It is obtained by aggregating the unit consumption changes at detailed levels, by sub-sector or end-use, observed over a given period. This ODYSSEE index does not include many factors such as structural changes and other changes, not related to energy efficiency (e.g. the rebound effect). See also: [www.odyssee-indicators.org](http://www.odyssee-indicators.org).

<sup>21</sup> See note 11 supra.

<sup>22</sup> Article 4.



The Directive requires each Member State to submit a National Energy Efficiency Action Plan. These action plans present the national strategy on how to achieve the Directive's energy savings objective. *Annex 3* gives a concise assessment of the national action plans. Some of them contain coherent and comprehensive strategies towards the target. Unfortunately, most plans reveal a clear gap between the Member States' political commitment to energy efficiency and the actions they propose. The European Council has requested that the National Energy Efficiency Action Plans be at the core of efforts towards achieving the EU's energy saving objective<sup>23</sup>. Ultimately, the national plans should be the all-encompassing reporting tool for Member States on their energy efficiency policies.

## 2.5 Development at regional and local level

Regional and local authorities have a crucial role to play in carrying out energy efficiency policies. Cities, towns and regions are usually responsible for planning permission, fiscal incentives and the proper application of zoning and building regulations. They are also increasingly drivers of energy efficiency through their public procurement policies.

With this in mind, in 2007 the Commission launched the Covenant of Mayors. Under this scheme, cities, towns and regions commit to go beyond the 20% greenhouse gas emission reduction in 2020, and to this end they will produce a sustainable energy action plan. This is an opportunity for an all-encompassing local view, integrating energy efficiency, renewable energy, urban transport and public procurement into a plan that will not only bring economic but also environmental and social benefits.

## 3. NEXT STEPS

**The Commission proposes an Energy Efficiency Package** consisting of the following elements: a proposal for a recast of the Energy Performance of Buildings Directive; a proposal for a revision of the Energy Labelling Directive; a proposal for a new Directive containing a labelling scheme for tyres; a Commission decision establishing guidelines clarifying the calculation of the amount of electricity from cogeneration; a communication on cogeneration.

The Package is presented in sections 3.1 to 3.3 below.

### 3.1 Energy efficiency in buildings - a new way of capturing the potential

Energy use in residential and commercial buildings is responsible for about 40% of EU's total final energy consumption and 36% of the EU's total CO<sub>2</sub> emissions. The cost-effective energy saving potential by 2020 is significant: 30% less energy use within the sector is feasible. This equals a reduction of 11% use of the EU's final energy. However, energy use in this sector continues to increase.

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<sup>23</sup> Council of the European Union, Presidency Conclusions 19/20 June 2008 (11018/08).

Figure 4. Estimated gross energy consumption by sector in 2006 (EU-27)

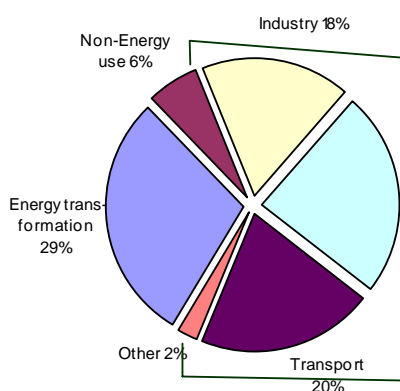
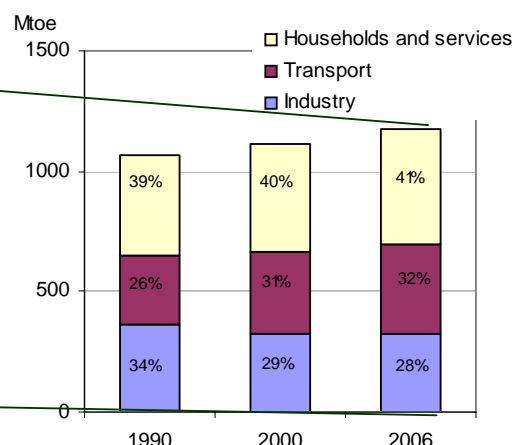


Figure 5. Development of the final energy consumption by sector (EU-27)



The Buildings Directive<sup>24</sup> provides a framework for concrete measures and requirements at Member States level and its revision means simplification, clarification and stronger provisions. Member States will remain responsible for establishing concrete requirements. The Commission proposes that the 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation<sup>25</sup> is eliminated: energy performance requirements will therefore apply to more buildings. Energy performance certificates should become more reliable, heating and air-conditioning systems regularly inspected and the Member States will draft national plans on low energy buildings. The proposed modifications give Member States the opportunity to reap more than half of the remaining cost-effective potential in this dispersed sector (60-80 Mtoe or 5-6%/year of total primary energy demand in 2020).

In 2009, the Commission will launch a major 'Build-up' initiative to increase the awareness of all parties in the building chain of the saving potential, incorporating the current Buildings Platform and complementing the Lead Market Initiative on Sustainable Construction. These seek to spur the market uptake of innovative, sustainable and energy efficient construction solutions. The Commission will also work with social partners to promote investment in the sector.

The Commission also owns large buildings and is working on the certification of their energy performance so as to be in line with the requirements of the Directive.

### 3.2 Energy efficiency of products

As part of the Action Plan on Sustainable Industrial Policy and Sustainable Consumption and Production, the Commission has presented a proposal to extend the

<sup>24</sup> Directive 2002/91/EC (OJ L 1, p. 65).

<sup>25</sup> The definition of major renovation is kept: either the investment should be more than 25% of the value of the entire building (excluding the land), or more than 25 % of the building envelope should undergo structural renovation. Thus the renovation of an apartment in a large multi-family building would, in most cases, not be covered by the requirements.

scope of the Ecodesign Directive<sup>26</sup>. It is now followed by a proposal to revise the Energy Labelling Directive<sup>27</sup>. Both instruments will cover commercial and industrial energy-using products and energy-related products such as windows and motors used in buildings. A revised Labelling Directive will, when relevant, identify the labelling classes below which products will not be procured by or receive incentives from public authorities.

A proposal for a labelling scheme for tyres is also part of this policy package. The objective is to promote the market take-up of fuel efficient tyres, also known as low rolling resistance tyres.

By spring 2009, the Commission is expected to adopt ecodesign measures for i.a. light bulbs (leading to the phasing out of wasteful incandescent light bulbs), electric equipment in stand-by mode, street and office-lighting equipment, external power supplies and set-top boxes for televisions. Boilers and water heaters, televisions, motors and several white goods will also be addressed in 2009. By way of example of the potential benefits, replacing a medium sized 'M' class gas domestic boiler (power input 22kW) which is representative of the current average sold with a high-efficiency model, leads to the annual saving on fuel costs of about 250-300€ The payback period is around 5-6 years.<sup>28</sup>

### 3.3 Cogeneration

Cogeneration is a highly efficient technique to generate electricity and heat. Because of the need of parallel heat load, cogeneration is mainly used in district heating and industry. The Cogeneration Directive<sup>29</sup> promotes high efficiency cogeneration. To ensure its full implementation detailed guidelines have been adopted. They clarify the procedures and definitions for a harmonised methodology to determine the quantity of electricity generated from cogeneration<sup>30</sup>. They allow Member States to better implement the Directive.

The Communication from the Commission presents further possibilities to enhance cogeneration.

### 3.4 Financing

To support investments to improve energy efficiency, financing schemes<sup>31</sup> exist and the first results are positive: more urban development and renewal projects take energy efficiency into account. In Germany for example, in the period 1990-2006 efficiency measures in some 2.5 million homes were financed. Investments there in 2006 alone will achieve a long-term reduction of more than 1 million tonnes per annum in CO<sub>2</sub> emissions and provided 220,000 jobs for that year, mainly in the

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<sup>26</sup> COM(2008) 399 final.

<sup>27</sup> Directive 92/75/EEC (OJ L 297, p. 16).

<sup>28</sup> Preparatory Study on Eco-design of CH-Boilers - VHK, Delft 30.9.2007; [www.ecoboiler.org](http://www.ecoboiler.org).

<sup>29</sup> Directive 2004/8/EC (OJ L 52, p. 50).

<sup>30</sup> See Annex II of the Directive 2004/8/EC.

<sup>31</sup> The European Investment Bank and the European Bank for Reconstruction and Development provide financial instruments targeted at various beneficiaries. At EU level, the Cohesion Policy Funds, the 7<sup>th</sup> Research Framework Programme and other sources exist such as the Global Energy Efficiency and Renewable Energy Fund.

construction industry. Other similar initiatives are taking place in several other Member States.

The potential is clearly there, but it is not yet generally recognised and initiatives are scattered. Designing effective energy efficiency measures targeted at households and SMEs requires a well coordinated financing framework coming from private, national and EU sources in line with Community legislation. The latter sources include the Structural Funds. Community funds, like Intelligent Energy, and loans can then ensure their replication across the EU. The standards can subsequently serve as a model to be followed at national level.

The Commission is also working with the EIB and EBRD to set up an EU Sustainable Energy Financing Initiative to mobilise large-scale funding from capital markets for investments in energy efficiency, renewable energies, the clean use of fossil fuels and combined heat and power from renewables in Europe's cities. The difficult situation in financial markets reinforces the need to look into the benefits of a publicly supported instrument. A joint effort is required to explore new and innovative financing schemes to enable welfare enhancing investments in energy efficiency, characterised by levels of risks not covered by the markets.

A holistic overview of financial support, not just for energy efficiency, but for all policies that contribute to combating climate change and ensuring energy supplies, will be part of the re-launched Lisbon strategy later this year. In times of scarce public resources, there is a need to ensure that public funds are spent where they can contribute in the most cost effective way to European goals.

With the unprecedented crisis in international financial markets, the financial system is in the grip of a prolonged process of deleveraging. The question of how to fund innovative technologies to enhance energy efficiency will need to be addressed. The Commission will explore with the Member States measures to boost energy efficiency and green technology, for examples in buildings and in clean cars, which would provide opportunities for the economy, including for SMEs, while at the same time helping the EU to meet its climate change aim. Increasing demand for energy efficient goods and services through reduced taxation and other targeted fiscal measures is another option which will be further investigated.<sup>32</sup>

Cohesion Policy programmes have allocated over EUR 4.2bn to the promotion of energy efficiency in the period 2007-13. Cohesion Policy Funds support a vast range of activities in this area, including energy efficiency improvements in industry, commerce, transport and public buildings, cogeneration and local energy production, innovation for sustainable energy, and training for monitoring and evaluation of energy performance. In addition, in the new Member States, Cohesion Policy supports investment in energy efficiency in residential housing under certain conditions. As some of these actions may be funded by other Cohesion Policy budget headings such as R&D and urban as well as rural regeneration, the actual allocation in support of Europe's Energy Policy is expected to be much higher. Furthermore, financial instruments, including debt finance and equity funds provided by the EIB

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<sup>32</sup>

COM(2008) 706 final, 29.10.2008: From financial crisis to recovery: A European framework for action.

Group (e.g. through structural programme loans) and EBRD, could allow managing authorities to obtain additional funding in support of Operational Programmes.

The Commission will also investigate the possibilities of linking public support with energy efficiency results in a wider context, as already suggested in the proposed Energy Labelling Directive for energy related products. One option could be a revised Energy Services Directive.

The Commission will present a Communication on the financing of low-carbon technologies in spring 2009. The Commission is also preparing a review of the energy products taxation Directive<sup>33</sup> which will provide an adapted framework to address energy efficiency and CO<sub>2</sub> emissions outside the Emission Trading Scheme.

## **4. FURTHER ACTIONS**

### **4.1 Evaluation of the European Energy Efficiency Action Plan (EEAP)**

As foreseen in EEAP in 2006, the Commission will evaluate it in 2009 and prepare a revised Action Plan, as requested by the European Council. The starting points should be the saving potentials and the cost-effectiveness of the policy tools. The EU's legislation on energy efficiency should be analysed. Energy efficiency must become fully integrated into the broader energy policy, in particular the EU Energy and Climate Package with its dynamic CO<sub>2</sub> and renewable energy policies. The Action Plan will remain complementary to the Emission Trading Scheme. The objectives will have to be more demanding in the longer term e.g. 2030 and 2050. A pre-condition is that a commonly agreed verification or measurement system on energy saving exists<sup>34</sup>, and that proper impact assessments are carried out.

The Plan will focus on energy supply, transmission and energy consumption sectors. The emphasis on the building sector will remain: as more people are living in cities, the latter present a natural opportunity for increased efficiency. The Covenant of Mayors and similar city networks are crucial to realize the ambitions. Cities also provide possibilities to enhance more efficient urban transport and the use of electric cars. With 23% of total CO<sub>2</sub> emissions coming from road transport<sup>35</sup>, the reduction of vehicles energy intensity and emissions is a major challenge. Information and communication technologies (ICTs) also merit special attention as ICT-based solutions can enable amongst others the continuous monitoring, control and automation of energy use, and make energy use and even cost information visible to consumers in real (or near real) time. Early next year, the Commission will present a Communication and a Recommendation identifying specific actions to overcome barriers and exploit the full potential of ICTs in enabling a more efficient use of energy.

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<sup>33</sup> Directive 2003/96/EC (OJ L 283, p. 51).

<sup>34</sup> We should be able to measure energy efficiency gains. There is no common methodology on how to measure energy efficiencies but several indicators are used, as presented in this communication. The Energy Services Directive provides for the further development of a harmonised measurement methodology, and Member States and the Commission are jointly working on common guidelines for such methodology.

<sup>35</sup> European Environment Agency, Annual European Community Greenhouse Gas Inventory 1990-2005 and Inventory Report 2007, p. 88.

## 4.2 International relations

The Community is exchanging views and best practices on energy efficiency with third countries. Bilaterally, in dialogues with Brazil, China, India, Russia, the USA and in the context of enlargement countries and the European Neighbourhood Policy, energy efficiency features high on the agenda. Regionally, the issue is addressed e.g. through the Euromed energy cooperation, the Baku process with partners in Eastern Europe, the Caucasus and Central Asia, and in the framework of the Africa-EU Energy Partnership. Multilaterally, the establishment of the International Partnership for Energy Efficiency Cooperation was endorsed last June by the G8 and the Community<sup>36</sup>. The Heiligendamm Dialogue Process is a similar framework established by the G8. The Community is a signatory to the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects.

## 5. CONCLUSIONS

Energy and its use affect us all. Energy efficiency combats climate change, improves energy security, contributes to the attainment of the Lisbon goals, and reduces costs for all EU citizens.

Realising energy efficiency gains and at least reaching the 20% energy saving objective must continue to be a priority and the Community's common goal. Policy implementation efforts should be intensified - in particular through the National Action Plans - and the initiatives of this package must be steered swiftly through the legislative process. The proposed measures together with financing incentives, energy taxation and raising awareness will bring about permanent, concrete results.

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<sup>36</sup> China, India and South Korea have also endorsed the IPEEC.

## Annex 1

### Expected annual primary energy saving potential by 2020 for EU27 for some specific Energy Efficiency measures (full implementation)

Measures		Yearly primary energy savings by 2020 compared to 'business as usual' scenario in Mtoe	Yearly primary energy savings by 2020 compared to 'business as usual' scenario in %	Reference document <sup>37</sup>
1	energy services Dir 2006/32/EC	Max 193	Max 9.8%	COM(2008)11 (as of 2016)
2	eco-design Dir 2005/32/EC (appliances) and labelling framework Dir 92/75/EC	96	4.9%	EuP preparatory studies <a href="http://ec.europa.eu/energy/demand/legislation/eco_design_en.htm#consultation_forum">http://ec.europa.eu/energy/demand/legislation/eco_design_en.htm#consultation_forum</a>
	energy star agreement with USA	2	0.1%	
3	buildings Dir 2002/91/EC	130	6.6%	SEC(2006)1174
4	cogeneration Dir 2004/8/EC	23	1.2%	COM(2002)415
5	fuel efficiency in road vehicles - CO <sub>2</sub> & cars –public procurement	36	1.9%	COM(2007)856 & SEC(2007)1723 COM(2007)817
6	urban transport - integrated approach	20	1.1%	Policy assessment of the CIVITAS initiative
<b>TOTAL NET (taking into account the interplay of measures and the witnessed implementation speed)</b>		<b>256</b>	<b>13%</b>	
<b>OBJECTIVE EU27 in 2020</b>		<b>394</b>	<b>20%</b>	
Note: PRIMES model 'business as usual' baseline projections (update 2007) in 2020: EU27 TOTAL primary energy consumption = 1968 Mtoe.				

<sup>37</sup>

The reference documents contain projected effects of the proposed policies therein at the time of their adoption, expressed either in final or primary energy demand percentages. The ratio between final and primary energy saving is approximately 2:3.

## Annex 2

### Energy saving potentials by final energy consuming sector and key drivers, actors and barriers for energy efficiency improvements

Sector	Share in final energy cons. (2006)	Saving potential by 2020 <sup>38</sup>	Key drivers for energy efficiency	Key barriers	Key actors
All sectors	100%	21%	<ul style="list-style-type: none"> <li>• Energy policies</li> <li>• Market forces/ energy prices</li> <li>• Financing and taxation</li> <li>• Awareness</li> <li>• Technological development</li> </ul>	<ul style="list-style-type: none"> <li>• Incomplete implementation of energy efficiency legislation</li> <li>• Lack of awareness</li> <li>• Market failures</li> </ul>	<ul style="list-style-type: none"> <li>• Everybody</li> </ul>
Households and commercial buildings	41%	30%	<ul style="list-style-type: none"> <li>• EU and national/regional legal requirements</li> <li>• Technological developments</li> <li>• Financial and fiscal incentives</li> <li>• Energy services Companies</li> <li>• Information instruments (e.g. labelling, certificates, metering, campaigns)</li> <li>• Behaviour trends</li> </ul>	<ul style="list-style-type: none"> <li>• High up-front costs</li> <li>• Owner-tenant dilemma</li> <li>• Lack of awareness on the benefits</li> <li>• Overestimation of the investment needs</li> <li>• No access to attractive financing options</li> <li>• Energy efficiency not recognized as business opportunity</li> </ul>	<ul style="list-style-type: none"> <li>• Property owners and tenants</li> <li>• Construction business</li> <li>• Financial institutions</li> <li>• Consumer associations</li> <li>• National/local authorities</li> <li>• EU institutions</li> </ul>
Transport	31%	20%	<ul style="list-style-type: none"> <li>• EU and national/regional legal requirements</li> <li>• Consumer awareness</li> <li>• Information campaigns</li> <li>• Labelling</li> <li>• High energy prices</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of information</li> <li>• Limited commitment from transport industry</li> <li>• Insufficient infrastructure (e.g. poor urban planning, limited public transport)</li> <li>• Behaviour patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Transport companies</li> <li>• Associations</li> <li>• Citizens</li> <li>• National/local authorities</li> <li>• European institutions</li> </ul>
Industry	28%	19%	<ul style="list-style-type: none"> <li>• High energy and carbon prices</li> <li>• Voluntary and mandatory agreements</li> <li>• Improved energy efficiency of production processes</li> </ul>	<ul style="list-style-type: none"> <li>• High up-front costs</li> <li>• Limited commitment</li> <li>• Low awareness of the benefits</li> <li>• Overestimation of the investment needs</li> <li>• Lack of financing</li> <li>• Low share of energy in production costs</li> </ul>	<ul style="list-style-type: none"> <li>• Companies</li> <li>• Industry associations</li> <li>• National/local authorities</li> <li>• European institutions</li> </ul>

<sup>38</sup>

Source: see note 7 supra.



### Annex 3

#### **Assessment of the National Energy Efficiency Action Plans**

This Annex gives a concise summary of the assessment of the National Energy Efficiency Action Plans (NEEAPs) submitted by all Member States under Directive 2006/32/EC.<sup>39</sup>

##### *Background*

In accordance with Article 14 (2) of the Directive, Member States were required to submit their first NEEAPs to the Commission not later than 30 June 2007.

For the purpose of the first NEEAP, each Member State should have adopted an overall national indicative savings target of 9% or higher<sup>40</sup>, to be achieved in 2016, and an intermediate national indicative savings target for 2010. NEEAPs are intended to set out the national strategies of Member States towards the overall and intermediate national indicative targets. Member States should show, in particular, how they intend to comply with the Directive's provisions on the exemplary role of the public sector and the provision of information and advice on energy efficiency to end users.

The first NEEAPs should stimulate the translation of energy saving objectives into concrete and coherent measures and actions at the level of each Member State and set implementation milestones. The plans should trigger an exchange of experience between the Member States and create a dialogue between the Commission and Member States. Subsequent implementation, monitoring and evaluation of the strategies and the measures identified, complemented by benchmarking and a 'peer review' process at European level, should help Member States learn from the successes and mistakes of others and should facilitate the diffusion of best practices throughout the EU.

##### *Assessment of the NEEAPs*

The first NEEAPs propose a wide diversity of policy packages and measures targeting different end-use sectors. Many NEEAPs demonstrate coherent and comprehensive strategies towards the intermediate and overall targets, backed by institutional and financial provisions. A number of NEEAPs clearly identify their priority end-use sectors or policy tools.

In contrast, some NEEAPs show piecemeal thinking with a scattering of fragmented energy efficiency measures. The absence, or sporadic indication of savings estimates in the majority of NEEAPs, along with the mostly limited degree of detail about assumptions made in estimating savings from different measures, have impeded the quantitative assessment of the NEEAPs and how realistic they are. In addition, for

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<sup>39</sup> More detailed results of the assessment of NEEAPs will be presented in a separate Commission Staff Working Document planned to be produced by the end of 2008.

<sup>40</sup> Percentage of saved final energy consumption of non ETS sectors to be measured in 2016 in relation to the average final energy consumption during five-year period previous to the implementation of the Directive for which official data are available (Directive 2006/32/EC (OJ L 114, p. 64), Annex 1).

several Member States there is a considerable gap between the political commitment to energy efficiency and the measures adopted or planned, as reported in the NEEAPs, and the resources attributed to preparing it.

Almost all Member States have introduced 9% national indicative energy savings target for 2016 calculated in line with Annex I of the Directive. Some Member States have committed to targets that exceed 9%: Italy 9.6%, Cyprus 10%, Lithuania 11%, and Romania 13.5%. This is very positive. Other Member States have indicated that they expect savings from measures to go beyond 9% without committing to the higher target (Luxembourg 10.4%, Ireland 12.5% and the United Kingdom 18%). A number of Member States indicate that the NEEAPs form part of their strategy to reach the 20% reduction in energy demand by 2020, among them Austria, Ireland and Sweden. A few Member States fail to comply with some provisions related to the setting of national indicative savings targets. Non-conformity is related in particular to the calculation methodology set out in Annex I and to the 2008-2016 timeframe.

Ongoing measures that qualify as "early action"<sup>41</sup> dominate the majority of NEEAPs and some Member States indicate stricter interpretation of such early actions. Some Member States explicitly indicate the share of savings from early action. In contrast, the NEEAPs of some Member States such as Estonia, Latvia and Poland rely extensively on new measures, though it is difficult to assess whether certain Member States will be able to deliver in accordance with their strategies given the brief descriptions of measures and the absence of saving estimates.

Measures in the buildings sector, especially residential buildings, have been at the heart of most NEEAPs. Numerous measures target refurbishment of existing buildings. Some Member States declare ambitious strengthening of building codes and support passive or low-energy house buildings. With varying degrees of detail, almost all NEEAPs also include measures in the tertiary, transport and industrial sectors. However, as regards agriculture, the only NEEAPs to include measures specific to this sector are from Latvia, the Netherlands, Spain and Sweden. Some NEEAPs have included measures that fall outside the scope of the Directive. Most commonly these include fuel switch and power generation, including large Combined Heat and Power installations, biomass district heating, network loss reduction, biofuels, measures in international transport, and measures that have some impact on the Emission Trading Scheme.

In addition, many of the NEEAPs include a number of promising horizontal measures. The majority of the NEEAPs propose a range of measures to fulfil the provisions regarding the exemplary role to be played by the public sector, but some Plans contain little or no information in this regard. However, few NEEAPs demonstrate good strategies for communicating the exemplary role of the public sector. Public procurement is a key element in capturing the power of the public purse for energy efficiency and the majority of NEEAPs contain public procurement measures. However, it is not always clear if these measures contain concrete

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<sup>41</sup> Energy improvement measures initiated by the Member State not earlier than 1995 (in certain limited cases not earlier than 1991) that have a long-lasting effect, which will still lead to energy savings in 2016 (Directive 2006/32/EC, Annex 1).

requirements, as called for in Annex VI of the Directive, and exactly how these would be met.

Most Member States have introduced a variety of information measures. These range from measures aimed at altering general public behaviour, such as public awareness raising campaigns, public training and education, advice on energy use and general information sources like web tools and publications, to measures that target business entities. The latter comprise sector-focussed information campaigns, trainings for professionals, energy audits and energy efficiency publications for professional stakeholders.

A number of NEEAPs provide good examples of best practices and innovative measures with a strong set of diverse information measures that target the general public and businesses.

### Conclusions

The analysis of the NEEAPs has shown that many Member States already recognised that with an integrated approach these national plans can become the key tool not only for the effective implementation of Directive 2006/32/EC, but also for the real push to achieving energy savings which go beyond obligations arising from the current EU legislation on end-use energy efficiency. The Commission recognises the great potential that NEEAPs could play to help with getting better focus and streamlining of Member States' policy, legal and support actions to help their citizens and all local market actors save energy in a cost-effective way, thus reducing emissions of greenhouse gases, increasing the competitiveness of European businesses and improving energy security of the EU. Given the growing importance of energy saving to energy security and sustainable development of the EU, the Commission would welcome Member States taking the initiative to further improve their current NEEAPs (eg. add/improve measures for important areas/sectors not sufficiently covered in their current plans, provide further details of planned actions, etc).

### Lessons for the future

The current NEEAPs could play a more important role. National plans will only be effective when they stand for real action: it should set a quantitative, measurable target with a time schedule and concrete steps on who is doing what and the budgetary and human resources available. National plans should require the competent national authorities to work together. Administrative structures should be in place with a clear division of responsibilities. Member States should also ensure that sufficient resources are made available for the promotion of energy efficiency services, information provision and monitoring.

Also ideally, the EU's Efficiency Action Plan could be linked more closely to the national efficiency plans and the latter could take into account longer term time horizons (e.g. 2030, 2050) and more ambitious targets that are agreed to by the Member States at EU level. Integration with other reporting obligations, especially those related to climate protection - e.g. alignment of reporting periods, streamlined methodologies on calculation of energy savings and reduction of CO<sub>2</sub> emissions - would reduce the reporting burden already carried by the Member States.