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Action Plan for Energy Efficiency: Realising the Potential

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1. INTRODUCTION

The European Union is facing unprecedented energy challenges resulting from increased import dependency, concerns over supplies of fossil fuels worldwide and a clearly discernable climate change. In spite of this, Europe continues to waste at least 20% of its energy due to inefficiency. The EU can and must lead the way in reducing energy inefficiency, using all available policy tools at all different levels of government and society.

The direct cost of our inability to use energy efficiently amounts to more than 100 billion euros annually by 2020[1]. Realising our savings potential in a sustainable manner is a key element in Community energy policy. It is by far the most effective way concurrently to improve security of energy supply, reduce carbon emissions, foster competitiveness and stimulate the development of a large leading-edge market for energy-efficient technologies and products. This remains equally true when the investment costs required to achieve this savings potential are taken into account. The need for a strengthened policy aimed at more energy efficient consumption and production patterns was underlined in the Commission Green Paper on "A European Strategy for Sustainable, Competitive and Secure Energy"[2]. The 2006 Spring European Council[3] called for the adoption as a matter of urgency of an ambitious and realistic Action Plan for Energy Efficiency, bearing in mind the EU energy saving potential of over 20% by 2020.

Realising this potential will require a significant shift in our approach to energy consumption. Europe will need to more than double the rate of improvement in energy efficiency compared to recent years. A paradigm shift is required to change the behavioural patterns of our societies, so that we use less energy while enjoying the same quality of life. Producers will have to be encouraged to develop more energy-efficient technologies and products, and consumers will need stronger incentives to buy such products and use them rationally. Using best available technology will be of key importance. While the objective of this Action Plan can be achieved using existing technology, it is however evident that the uptake of innovative technologies emerging during the lifetime of the Action Plan should equally be encouraged.

Realising the 20% potential 2020, equivalent to some 390 Mtoe, will result in large energy and environmental benefits. CO_2 emissions should be reduced by 780 Mt CO_2 with respect to the baseline scenario, more than twice the EU reductions needed under the Kyoto Protocol by 2012. Additional investment expenditure in more efficient and innovative technologies will be more than compensated by the more than € 100 billions annual fuel savings.

The present document sets forth such an Action Plan with a view to realising our potential and maintaining Europe's position as one of the most energy-efficient regions in the world. The policies and measures in the Plan are based on consultations on the Green Paper on Energy Efficiency[4]. Most of these have been specifically supported by stakeholders participating in the consultation process. The main points raised in the analysis and the responses to the

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1 390 Mtoe at USD 48/barrel net of taxes.

2 COM(2006)105 final of 08.03.2006.

3 Presidency Conclusions of 23/24 March 2006. 7775/1/06 REV1 of 18.05.2006.

4 Green Paper on Energy Efficiency, "Doing More with Less", COM (2005) 265 final of 22.06 2005. A total of 241 responses calling for action in all energy sectors were received during the public consultation process on this Green Paper. (Commission Staff Working Document (SEC(2006)693 of 29.05.2006)).

questions of the Green Paper on Energy Efficiency referred to the need to improve the availability and quality of information on energy consumption and on available energy-efficient technologies and techniques. Energy efficiency in the building sector was identified as a top priority. Improving energy efficiency in the transport sector was considered of special importance, since this sector consumes the bulk of oil products and has the fastest growing emission profile. In industry, a significant potential to reduce energy demand and CO_2 emissions was highlighted. Responses called as well for the use of a wide range of policy instruments at national, regional and local levels (i.a. wider use of targeted and coherent tax measures, internalising external costs, full support of Member States through National Energy Efficiency Action Plans, non-binding guidelines, labels and targets, and public-sector leadership in procurement). Binding minimum efficiency requirements for automobiles were also called for.

In addition, the European Parliament's Opinion on the Green Paper[5] sets forth over 100 recommendations. These, too, are very much in line with proposals in the Action Plan. Contributions and support for EU's energy saving potentials of 20% by 2020 were received from a High Level Group on competitiveness, energy and the environment set up by the Commission and bringing together relevant stakeholders.[6]

2. OBJECTIVE AND SCOPE

This Action Plan outlines a framework of policies and measures with a view to intensify the process of realising the over 20% estimated savings potential in EU annual primary energy consumption by 2020.[7] The Plan lists a range of cost-effective measures[8], proposing priority actions to be initiated immediately, and others to be initiated gradually over the Plan's six-year period. Further action will subsequently be required to reach the full potential by 2020.

The Action Plan is intended to mobilise the general public and policy-makers at all levels of government, together with market actors, and to transform the internal energy market in a way that provides EU citizens with the globally most energy-efficient infrastructure, buildings, appliances, processes, transport means and energy systems. Given the importance of the human factor in reducing energy consumption, this action plan also encourages citizens to use energy in the most rational manner possible. Energy efficiency is about informed choice by individuals, not just about legislation.

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5 European Parliament Report P6_A(2006)0160 of 03.05.2006.

6 The first report of the High Level Group was dated 2 June 2006 (*"Contributing to an integrated approach on competitiveness, energy and the environment policies - Functioning of the energy market, access to energy , energy efficiency and the EU Emissions Trading Scheme"*; http://ec.europa.eu/enterprise/environment/hlg/hlg_en.htm). This Report specifically addressed a series of recommendations to improve energy efficiency.

7 Compared to baseline. See COM(2005)265 final of 22.06 2005.

8 While the exact interpretation of cost-effectiveness in Community legislation on energy efficiency has deliberately been left open to Member States, the lowest life-cycle cost (LCC) method for meeting foreseen energy investments (on the energy supply or demand side) is generally regarded as the most straightforward and easy-to-interpret measure of economic evaluation.

3. SAVINGS POTENTIAL AND IMPACTS

Figure 1 below shows how energy efficiency improvements have reduced EU energy intensity during the past 35 years. It demonstrates that by 2005, "negajoules" (or avoided energy consumption through savings) have become the single most important energy resource.

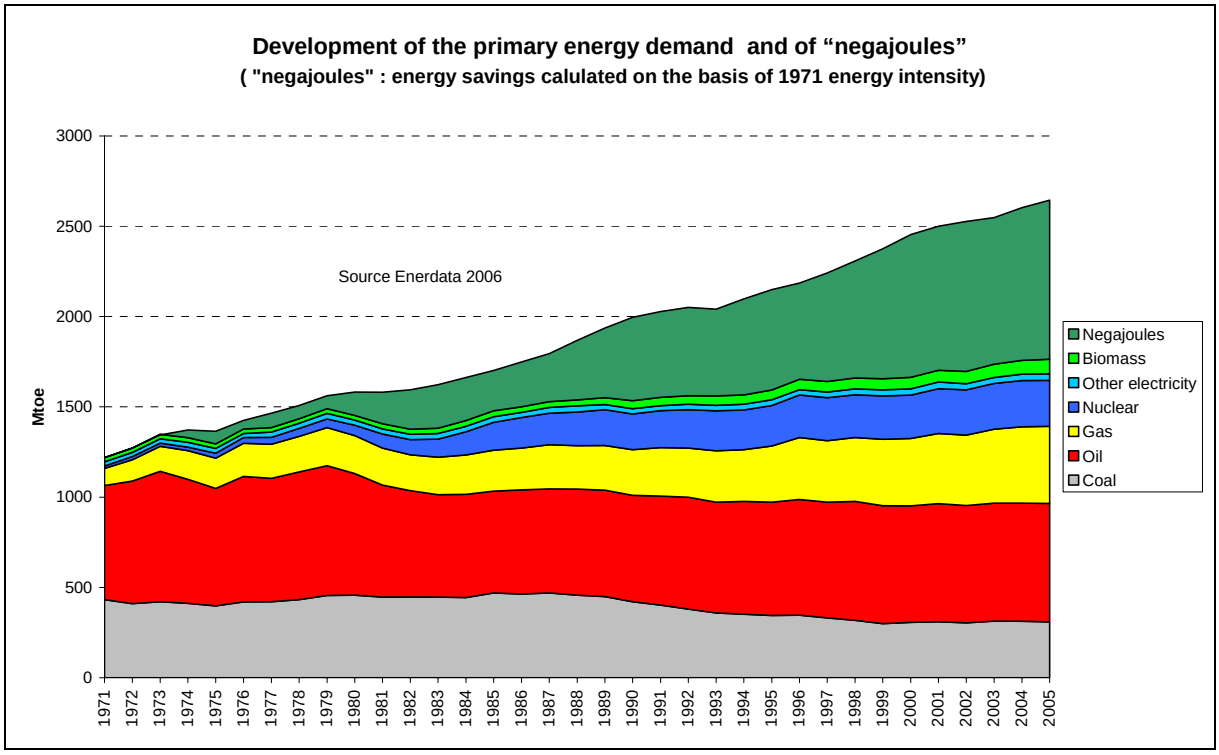

Figure 1

Even though energy efficiency has improved considerably in recent years, it is still technically and economically feasible to save at least 20% of total primary energy by 2020 on top of what would be achieved by price effects and structural changes in the economy, natural replacement of technology and measures already in place. Partly because of its large share of total consumption, the largest cost-effective savings potential lies in the residential (households) and commercial buildings sector (tertiary sector), where the full potential is now estimated to be around 27% and 30% of energy use, respectively. In residential buildings, retrofitted wall and roof insulation offer the greatest opportunities, while in commercial buildings, improved energy management systems are very important. Improved appliances and other energy-using equipment still offer enormous energy savings opportunities. For manufacturing industry, the overall potential is estimated to be around 25%, where peripheral equipment such as motors, fans and lighting[9] offer the most important savings potential. For transport, a similar full savings potential of 26 % is estimated, a figure which includes a

[9] 20% of global electrical energy production today is used for lighting. According to studies, the adoption of high efficiency Light Emitting Diode (LED) technology, already available on the market, could by 2015 save 30% of today's consumption for general lighting and 50% by 2025.

significant impact from shifting to other modes of traffic[10], in line with the Mid-term review of the White Paper on transport.[11]

Sector	Energy consumption (Mtoe) 2005	Energy Consumption (Mtoe) 2020 (Business as usual)	Energy Saving Potential 2020 (Mtoe)	Full Energy Saving Potential 2020 (%)
Households (residential)	280	338	91	27%
Commercial buildings (Tertiary)	157	211	63	30%
Transport	332	405	105	26%
Manufacturing Industry	297	382	95	25%

Figure 2: Estimates for full energy saving potential in end-use sectors[12]

On the basis of this full potential scenario for end-use sectors, the additional savings from new policies and measures and from strengthening existing ones are realistically estimated to be up to 20% (1.5% or 390 Mtoe per year) by 2020 (including savings in end-use sectors and at the level of energy transformation). These are in addition to improvements in energy intensity of 1.8% or 470 Mtoe per year due to expected structural changes, the effects of previous policies and autonomous changes brought about by natural replacement of technology, energy price changes, etc. These effects are illustrated in figure 3, where "previous policy" refers to legislation at EU level that has already been adopted and implemented; "new policy" means measures currently being implemented and further strengthened by this Action Plan; "new policy beyond directives" refers to policies and measures developed in this Action Plan.

10 Wuppertal Institute 2005, based on Mantzos (2003) and "Economic Evaluation of Sectoral Emission Reduction Objectives for Climate Change", ECOFYS, March 2001. Additional information available in Final Report of Impact Assessment (CLWP: 2006/TREN/032), Appendix 4. July 2006.

11 Communication from the Commission to the Council and the European Parliament, "Keep Europe moving – Sustainable mobility for our continent. Mid-term review of the European Commission's 2001 Transport White Paper"; COM(2006)314 final.

12 Source: European Commission, EU-25 Baseline Scenario and Wuppertal Institute 2005.

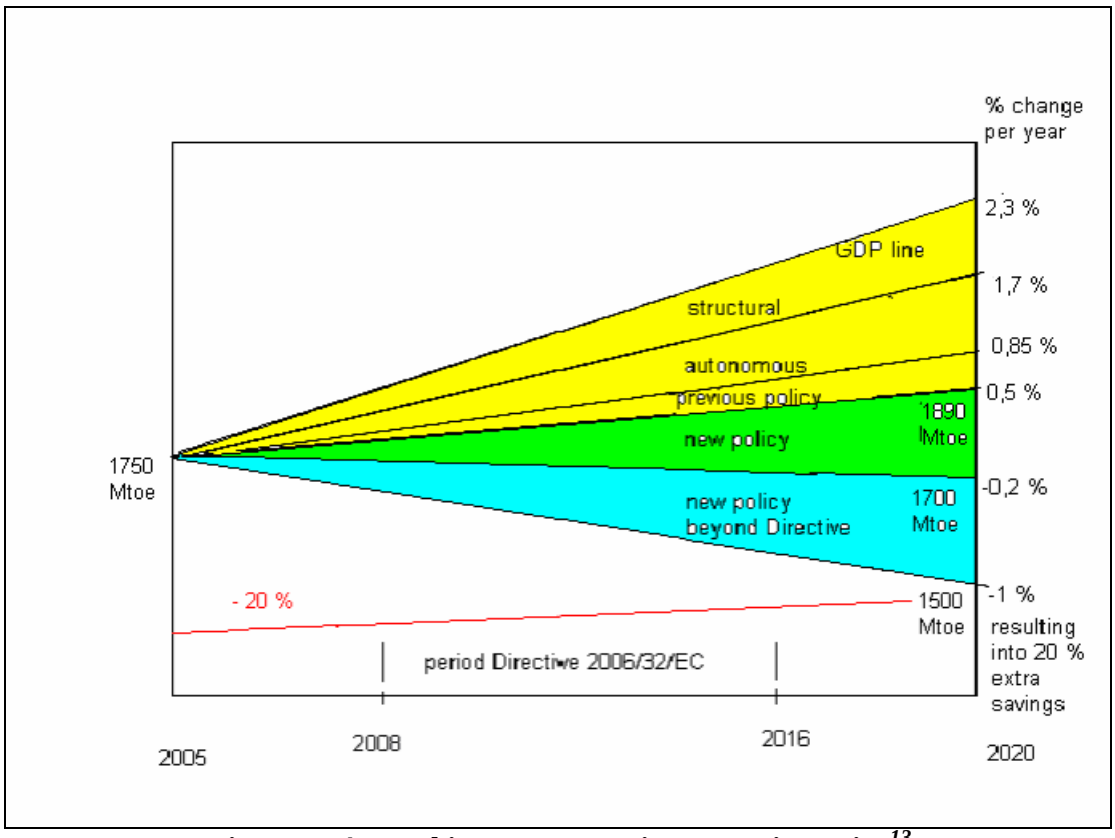

Figure 3: Annual improvements in energy intensity [13]

The actions set forth in the Action Plan represent a coherent and interlinked package of measures that will put the EU on track towards achieving at least the 20% cost-effective energy savings potential by 2020. They will provide benefits in terms of environmental improvement, reduced imports of fossil fuel, strengthened competitiveness of the EU industry, increased export opportunities for new, energy-efficient technology and positive employment effects. They also represent an ambitious goal, exceeding the average annual energy intensity improvements from previous decades by a considerable margin.

4. CONTEXT

This Action Plan highlights key proposals and places them in a political context. These proposals take into account recently adopted legislation on EU and other levels, which has already contributed to making Europe a world leader in energy efficiency. The Commission furthermore proposes 10 priority actions covering all energy sectors to be initiated immediately and implemented as soon as possible for maximum effect. Member States,

[13] 1.5% primary energy improvement is in addition to a 1.8% annual "business as usual" trend in improved energy intensity, consisting of the impact on efficiency of previous Community legislation (0.35% annually), and other effects (0.6% in structural changes, such as industrial developments, and 0.85% "autonomous improvement", such as normal replacement of technology stock, annually). Together, these will reduce energy intensity by 3.3% annually, holding the average annual increase in energy consumption to 0.5%, assuming an average GDP growth of 2.3% annually. The reference in Figure 3 to Directive 2006/32/EC is to illustrate the 9% savings target for the period 2008 – 2016. Alongside the potentials for energy efficiency at the point of consumption, important savings of approximately 20% can be made by preventing energy wastage during conversion and transmission of energy.

regional and local authorities and other stakeholders are called upon to take complementary measures to reinforce and strengthen this implementation.

The annex contains a comprehensive list of measures, along with a timetable. A full list of proposed measures together with further information on energy consumption, savings potentials, initiators and implementers, as well as impacts, is provided in an accompanying Commission Staff Working Document entitled "Analysis of the Action Plan for Energy Efficiency"[14]. An Impact Assessment Report and Executive Summary thereof are also provided[15].

5. POLICIES AND MEASURES

Energy efficiency is first and foremost a matter of controlling and reducing energy demand, although targeted actions are required for both energy consumption and energy supply. "Business as usual" is not a sustainable response.

Full implementation and enforcement of the existing and future regulatory frameworks is essential. The Commission has therefore rigorously pursued – through legal means – proper transposition and application of Community law affecting energy efficiency, including legislation on the internal energy market, buildings, and appliances.

Targeted sectoral and horizontal measures are included in the Action Plan as described below. First, the setting of dynamic energy performance requirements for a wide range of products, buildings and services are necessary. Targeted instruments are also needed for the energy transformation sector to improve the efficiency of both new and existing generating capacity and to reduce transmission and distribution losses. For the transport sector, a comprehensive and consistent approach targeting different actors, including motor and tyre manufacturers, drivers, oil/fuel suppliers and infrastructural planners, is necessary.

Secondly, appropriate and cost-reflective price signals are essential for improving energy efficiency and for overall economic efficiency. At the same time, improved financing tools and economic incentives targeting all sectors, implemented in full compliance with the applicable State aid rules, are required. Increased awareness and behavioural change are called for from the outset. Energy efficiency issues also urgently need to be addressed on a global level, using international partnerships and including for example, tradable goods such as appliances.

Innovation and technology also play a crucial role. The forthcoming Strategic Energy Technology Plan, planned for adoption in 2007, will provide a coherent long-term energy technology outlook and will be instrumental in spurring further technology-driven efficiency gains throughout society. Special attention should be paid to the opportunities offered by information and communication technologies (ICT).[16]

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14 SEC(2006)1173.

15 SEC(2006)1174 and SEC(2006)1175.

16 The wide-spread use of ICT equipment calls for a significant improvement in efficiency of semiconductors and battery technologies. The Commission will support research in these areas under the Seventh Research and Development Framework Programme, as announced in the first annual Report on the European Information Society (COM(2006)215).

Only if all of these measures are put in place will the potential be fully realised. This will require additional resources devoted to energy efficiency at all levels, including in the Commission.

The savings potentials and the likely impacts of some measures are larger or more evident than for others, as is illustrated in the Impact Assessment Report. Proposed measures in the Action Plan will also be subject to a thorough individual impact assessment. Monitoring, and updating of the Action Plan are necessary and a mid term review will be carried out in 2009 using, *inter alia*, national Energy Efficiency Action Plans[17] and Strategic EU Energy Reviews.

5.1. Dynamic energy performance requirements for energy-using products, buildings and energy services

A comprehensive framework of directives and regulations to improve energy efficiency in energy-using products, buildings and services is in force in Community law. These include the Eco-Design Directive,[18] the Energy Star Regulation,[19] the Labelling Directive[20] and its 8 implementing Directives, the Directive on Energy End-Use Efficiency and Energy Services[21] and the Energy Performance of Buildings Directive.[22] The Commission will encourage Member States towards an ambitious implementation and enforcement of these instruments to ensure the rapid development of a European internal market for energy-efficient goods and energy services and a lasting market transformation.[23] Where there is scope for additional legislative and supporting measures to be taken to strengthen and accelerate the development of this market, these measures will also be given priority.

(1) Making products more energy efficient

Consumers do not take into account to a sufficient degree the economic benefits of energy-efficient appliances and equipment. Consumers' buying decisions are however crucial to successful results. Efficiency should become a key element in the consumers' decisions. The Commission considers the use of dynamic energy efficiency standards combined with performance rating and labelling schemes a powerful tool for informing consumers and transforming the market towards energy efficiency.

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17 Required by Directive 2006/32/ECon energy end-use efficiency and energy services, OJ L 114 of 27.4.2006, p.64.

18 OJ L 191, 22.7.2005, p. 29.

19 (EC) N° 2422/2001

20 Directive 92/75/EC, OJ L 297, 13.10.1992, p. 16-19.

21 OJ L 114, 27.4.2006, p. 64.

22 OJ L 1, 4.1.2003, p. 65.

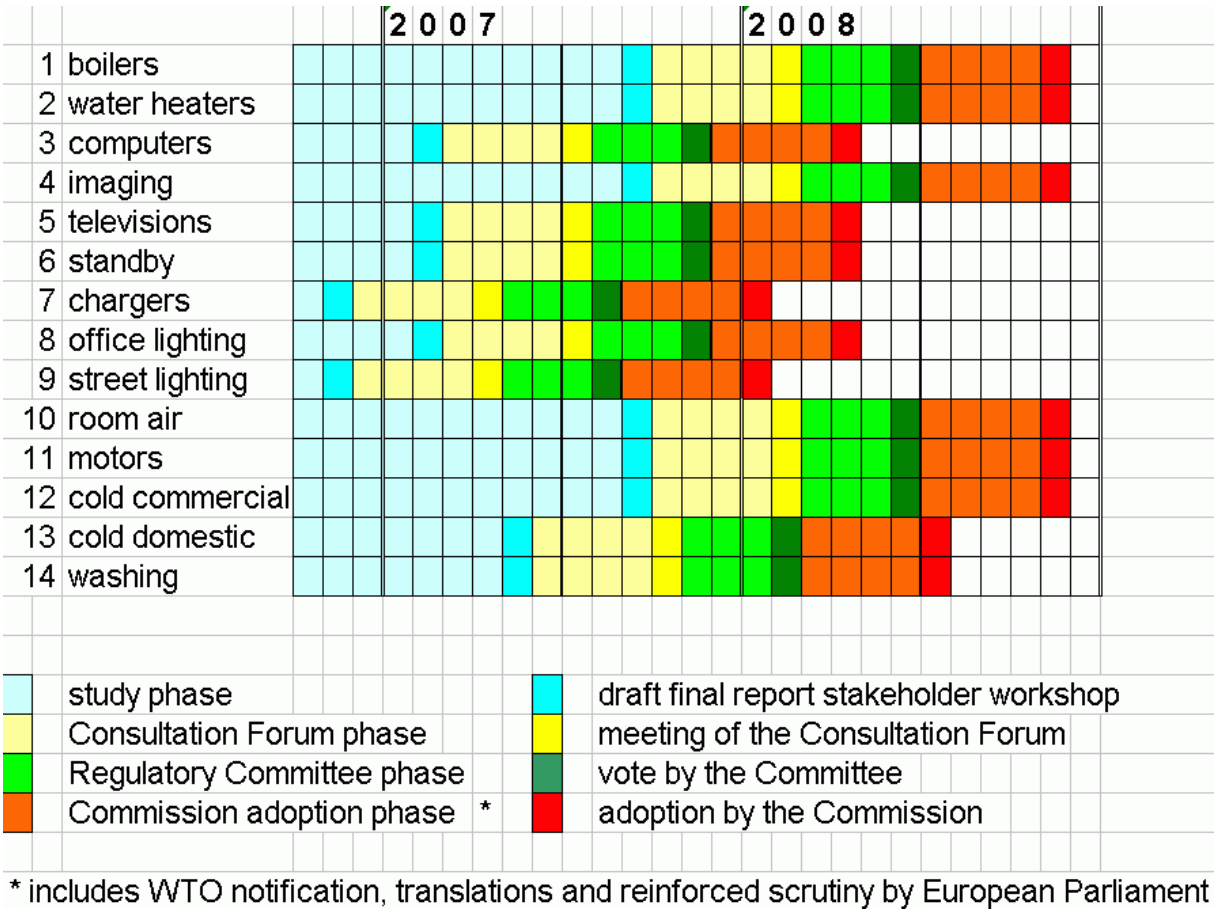
23 In the area of energy efficiency legislation, there are presently infringement procedures open against 20 Member States, both for non-notification and bad application.

Priority Action 1

Appliance and equipment labelling and minimum energy performance standards

Updated and dynamic labelling and minimum energy performance standards for appliances and other energy-using equipment will be developed as from 2007 on the basis of the Labelling and the Eco-design Directives. Special attention will be devoted to standby loss reduction. The Commission will start adopting such requirements for 14 priority product groups with a view to having all of them approved by the end of 2008. The Commission will revise the Framework Directive 92/75/EC on labelling to reinforce its effectiveness. The existing labelling classifications will be upgraded.

The Commission will begin, in 2007, the process of adopting minimum energy performance standards (eco-design requirements) in the form of implementing Directives for 14 priority product groups including boilers, water heaters, consumer electronics, copying machines, televisions, standby modes, chargers, lighting, electric motors and other products, in accordance with the time table below. These Directives will also include, to the extent possible, indications of future requirements, e.g., 5 years later, in order to prepare manufacturers for the new requirements in the design cycle. The Commission will ensure that appropriate measuring methods will be developed on time through CEN/CENELEC or other appropriate means. Products that do not meet the agreed minimum requirements may not be put on the market.



The Commission will furthermore in 2007 adopt a Work Plan to realise by 2010 an internal market for additional energy–using products. This should ensure that products that consume a significant part of total energy consumption will be covered by EU-wide minimum standards and performance rating/labelling, on the basis of the Eco-design Directive and/or the Labelling Directive (based on the least life-cycle cost methodology embedded in the directive). By 2010 a significant share of these products will be covered. Information will be made available to manufacturers regarding possible future revisions of performance requirements.

To increase the informational value of the EU labelling scheme, the Commission will revise, beginning in 2007, Framework Directive 92/75/EC to enlarge its scope, if this is shown to reinforce its effectiveness, to include other energy-using equipment, such as commercial refrigeration. The existing labelling classifications will be upgraded and re-scaled every 5 years or when new technological developments justify it, based on eco-design studies, with a view to reserve A-label status for the top 10 – 20 % best performing equipment.

At Member State level, the eco-design requirements and the labelling scheme need to be implemented, monitored and enforced. The labelling scheme will, at the same time, provide a highly useful instrument to support national policies, including information campaigns, rebate schemes, public procurement guidelines and white certification schemes.

(2) Developing services for energy end-use efficiency

The Directive on Energy End-Use Efficiency and Energy Services (2006/32/EC) adopted earlier this year provides a good framework for strengthening EU-wide co-operation on energy efficiency in areas where a clear potential for energy savings exists. Full collaboration from Member State authorities in implementing the Directive is required, in particular in so far as drawing up ambitious national Action Plans is concerned. Under the auspices of this Directive, the Commission will prepare a Memorandum of Understanding in co-operation with the Council of European Energy Regulators (CEER) setting forth guidelines and a code of conduct on improving energy end-use efficiency in all sectors. This Directive will also enable an assessment of an EU-wide White Certification Scheme in 2008, taking into account developments in Member States and progress with the EU harmonised measurement system for energy efficiency improvements.

(3) Making buildings more energy efficient

Priority Action 2

Building performance requirements and very low energy buildings ("passive houses")

The Commission will propose expanding the scope of the Energy Performance of Buildings Directive substantially in 2009, after its complete implementation. It will also propose EU minimum performance requirements for new and renovated buildings (kWh/m²). For new buildings, the Commission will also by the end of 2008 develop a strategy for very low energy or passive houses[24] in dialogue with Member States and key stakeholders towards more wide-spread deployment of these houses by 2015. The Commission will set a good example by leading the way, as far as its own buildings are concerned.

The Energy Performance of Buildings Directive (2002/91/EC), to be transposed by Member States by January 2006,[25] can play a key role in realising the savings potential in the buildings sector, which is estimated at 28%[26], and which in turn can reduce total EU final energy consumption by around 11%. However, to reap the full potential in the buildings sector, the Commission will propose expanding the scope of the Directive to include the large stock of smaller buildings, including by lowering significantly the current threshold from 1000 m² for minimum performance requirements for major renovations to include a majority of existing buildings. In 2009, it will also propose EU minimum performance requirements for new and renovated buildings (kWh/m²) and for components, such as windows. It will take the necessary steps, in collaboration with the building sector, to develop a deployment strategy for very low energy or passive houses, with a view to moving towards this type of houses as a standard in new construction in the medium term, as the appropriate technologies become commercially available.

A more comprehensive list of proposed actions related to existing EU legislation is set out in the annex.

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[24] Passive house are commonly defined as houses without traditional heating systems and without active cooling. This would involve very good insulation levels, and a mechanical ventilation system with highly efficient heat recovery. They can also be called: zero-energy houses, houses without heating.

[25] Member States may apply for an additional period of three years (until 2009) to apply fully certain provisions of this Directive.

[26] Wuppertal Institute 2005. Based on Mantzos (2003). An energy-saving electric bulb uses for example five times less current than a standard one. Replacing bulbs can easily save € 100 annually for an average household.

5.2. Improving energy transformation

There is a large potential for improving energy efficiency in energy production and distribution due to the significant size of current transformation losses (figure 4).

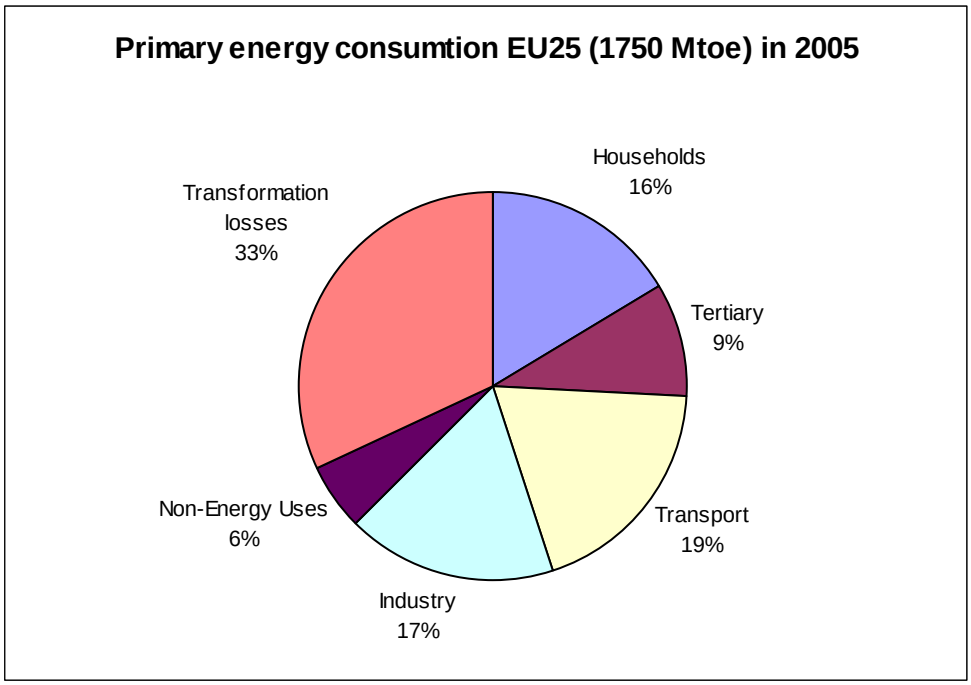

Figure 4

The energy transformation sector uses around one-third of all primary energy. At the same time, average transformation efficiency for electricity generation, for example is around 40%. New generation capacity can have an efficiency that is close to 60%. This creates a large potential for improving energy efficiency. Losses in the transmission and distribution of electricity – often as high as 10% - can also be reduced.

The EU emissions trading system is an effective means to incite electricity producers to reduce emissions and improve efficiency in the most cost-effective way. The Commission is currently planning a review of the system.[27] Through the establishment of the national allocation plan and the creation of an overall scarcity of CO_2 emissions allowances in the market, Member States can continue to use the EU emission trading system as an instrument to incentivise more efficient power production. Nonetheless, the Commission considers that a number of new measures are called for and therefore proposes a package of actions.

[27] Experience and discussions between the Commission and Member States on national allocation plans for the 2008-2012 period should also provide advice on pragmatic improvements of the system.

Priority Action 3

Making power generation and distribution more efficient

The Commission will by 2008 develop minimum binding efficiency requirements for new electricity, heating and cooling capacity lower than 20 MW[28] and consider, if necessary, such requirements for larger production units. It will also develop with the energy supply industry guidelines on good operating practices for existing capacity to raise average generation efficiency for all plants and agree guidelines on good regulatory practices to reduce transmission and distribution losses. A proposal for a new regulatory framework to promote the connection of decentralised generation will be put forward in 2007.

To improve overall efficiency in the energy transformation sector, the Commission will work closely with the energy supply and distribution industry and with the Council of European Energy Regulators (CEER) and the European Regulators Group for Electricity and Gas (ERGEG).

In the framework of the implementation of the Directive on the Promotion of Cogeneration (CHP) (2004/8/EC) there is scope for reducing losses in distribution networks. To date, only around 13% of the electricity consumed in the EU is generated using this technology. Harmonising calculation methods and guarantees of origin, as well as improved metering and establishment of norms will be essential to stimulate further progress in developing cogeneration. All of these objectives will be pursued. Minimum performance requirements and regulations for district heating and micro CHP will also be proposed as from 2007.

Here too, a more comprehensive list of proposed measures is set forth in the annex.

5.3. Moving on transport

The transport sector plays a central role in the European economy and as such accounts for almost 20% of total primary energy consumption. 98% of the energy consumed in this sector is fossil fuel. As transport is also the fastest growing sector in terms of energy use, it is a major source of greenhouse gases and of import dependency on fossil fuels. It is therefore essential to realise the potential for energy efficiency gains in this sector. These potentials can be achieved, in particular, by ensuring fuel efficiency of cars, developing markets for cleaner vehicles, ensuring the maintenance of proper tyre pressure, and by improving the efficiency of urban, rail, maritime and aviation transport systems, as well as changing transportation behaviour. Co-modality, i.e. the efficient use of different modes on their own, and in combination, will result in an optimal utilisation of resources, including energy. Promotion of short-sea shipping and the motorways of the sea as well other more environmentally friendly and energy saving modes will contribute to increasing energy efficiency.

[28] Generation not covered under the EU Emission Trading Scheme.

Priority Action 4
Achieving fuel efficiency of cars

The Commission, being determined to address energy efficiency and CO_2 emissions from cars, will if necessary propose in 2007 legislation to ensure that the 120 g CO_2/km target is achieved by 2012 through a comprehensive and consistent approach, in accordance with the agreed EU objective. In parallel it will propose to strengthen EU requirements for labeling of cars.

Due to the close link between fuel efficiency and CO_2 emissions, much of this potential can be realised through new measures, including legislation, to ensure that the necessary CO_2 reductions are delivered. Should it become clear that the voluntary commitments of the car industry to reach 140 g CO_2/km by 2008/2009 will not be honoured, the Commission will not hesitate to propose legislation. To that end a Commission Communication on a revised long-term strategy to reduce CO_2 from cars beyond the current voluntary commitments will be adopted before the end of 2006, aimed at reaching the Community objective of 120 g CO_2/km by 2012 through a comprehensive and consistent approach, involving other relevant stakeholders and authorities and other instruments[29].

The Commission will continue its efforts to develop markets for cleaner, smarter, safer and energy-efficient vehicles through public procurement and awareness-raising. Information and communications technologies will also be increasingly used to improve vehicle energy efficiency.[30] An amended and broadened Car Fuel Efficiency Labelling Directive (1999/94/EC) will be proposed to improve and harmonise the design of the label throughout the EU to incentivise consumers and producers toward more efficient vehicles. As with other products, "A" label status will be reserved for the 10-20% best performing cars and the labelling scheme will be updated after 3 years.

Tyres and tyre pressure can improve vehicle fuel efficiency by more than 5%, according to estimations.[31] The Commission will issue a mandate for a recognised European Norm and possible international standard for maximum rolling resistance limits and labelling for road vehicle tyres. It will furthermore facilitate voluntary agreements and consider other measures to encourage the fitting of tyre pressure monitoring and inflation systems on road vehicles, including compulsory fitting of tyre pressure monitoring systems on new road vehicles.

There is a need for reducing unnecessary energy consumption caused by inefficient urban transport. While recognising the responsibilities of local and regional authorities, the Commission will, in the framework of the forthcoming Green Paper on urban transport put forward joint solutions based on concrete measures that have been successfully tested, including, if appropriate, infrastructure use and road and congestion charges. These will include new approaches to encourage the use of public transport, car-sharing, non-motorised transport modes and telecommuting in European cities. Such joint solutions will take into

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29 E.g. the CO_2 element in passenger car related taxes (COM(2005)261).

30 Communication on the Intelligent Car Initiative (COM(2006)59 final) and 2nd eSafety Communication (COM(2005)431 final).

31 In addition to the substantial gains to be made by using the right tyres at the right pressure, an average driver can easily save € 100 on the annual fuel bill by driving in a more ecological way (International Energy Agency "Saving oil in a hurry", 2005).

consideration the Thematic Strategy on the Urban Environment,[32] as well as experience gained under the CIVITAS initiative.[33]

As regards improved energy efficiency in other transport modes, the Commission will consider market-based instruments for the maritime sector and will, following the recent Communication on climate change and aviation[34], propose measures for the aviation sector such as its inclusion under the Emission Trading Scheme, without putting into jeopardy these sectors' overall competitiveness. Energy efficiency in rail transport will be promoted by complete implementation of its legal framework by 2007. A more comprehensive list of proposed transport measures is set out in the annex.

5.4. Financing energy efficiency, economic incentives and energy pricing

Even though many energy efficiency measures are fully cost effective with very short pay-back periods, many such measures are not undertaken due to financial barriers. This is not least the case in small and medium-sized enterprises.

To facilitate financing of energy efficiency on the one hand and improve the way price signals impact on energy efficiency on the other, the Commission will identify and seek to remove remaining legal barriers in national legislation to the use of (i) companies supplying efficiency solutions[35] (the so-called "Energy Service Companies" or "ESCO's"), (ii) shared and guaranteed savings, (iii) third-party financing and (iv) performance contracting. The use of local revolving funds and clearing houses will be expanded.

Moreover, public-private partnerships (PPP) will be facilitated with the private banking sector, EIB Group, EBRD and other IFI funding to attract more funding covering debt financing, guarantee instruments and venture capital applications for new energy-efficient technologies in the EU.

Priority Action 5

Facilitating appropriate financing of energy efficiency investments for small and medium enterprises and Energy Service Companies

Through a number of specific initiatives in 2007 and 2008 the Commission will call upon the banking sector to offer finance packages specifically aimed at small and medium enterprises and Energy Service Companies to adopt energy efficiency savings identified in energy audits. Access to Community financing, such as Green Investment Funds, co-financed by CIP[36], will be made available for promoting eco-innovations.

The potential for energy efficiency improvements is particularly large in the new Member States. The Commission will further encourage the use of Structural and Cohesion funds to facilitate leveraging of private financing at national and local levels for energy efficiency.

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32 COM(2005)718 final.

33 Programme in the RTD Framework Programme to help cities to achieve a more sustainable, clean and energy-efficient urban transport system.

34 COM(2005)459 final.

35 These companies usually accept some degree of financial risk. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.

36 Competitiveness and Innovation Framework Programme (2007-2013).

Priority Action 6
Spurring energy efficiency in the new Member States

Within the framework of cohesion policy, energy efficiency is one of the priorities. The Commission will encourage European Regional Policy to deploy its national and regional programmes to promote more intensive investment[37] to improve energy efficiency, in particular in the new Member States, including in the multi-family and social housing sectors. In addition, the Commission will promote networking amongst Member States and regions to ensure financing of best practices in energy efficiency.

Experience has shown that taxation, as a means to internalise external costs, is a powerful tool in promoting energy efficiency.

Priority Action 7
A coherent use of taxation

The Commission will prepare a Green Paper on indirect taxation (2007) and will subsequently review the Energy Tax Directive[38] in 2008 to facilitate a more targeted and coherent use of energy taxation by integrating notably energy efficiency considerations and environmental aspects.

In addition, the Commission will consider in 2007 the costs and benefits of using tax credits as incentives for enterprises, on one hand, to promote the increased production of certified energy-efficient appliances and equipment and for consumers, on the other, to promote the purchase of such appliances and equipment.

As regards vehicle taxation, the Commission calls upon the Council to adopt as soon as possible its proposal to relate taxation to CO2 performance, and invites Member States to begin introducing such modifications into tax reforms they may be considering (COM(2005)261).

The Commission will also propose in 2007 special tax arrangements for commercial diesel, aiming at narrowing excessive differences in tax levels between Member States. This proposal should increase energy efficiency in the transport haulage by reducing "tank tourism".

Finally, the Commission recalls that a number of Member States are already entitled to use the reduced VAT rate to specifically favour investments to improve energy efficiency (better insulation of buildings, etc.)

5.5. Changing energy behaviour

The efficient use of energy requires factors that motivate, facilitate and reinforce rational and responsible behaviour. Institutional capacity, awareness, and clear, credible and accessible information on energy-using technologies and techniques are important predisposing elements for rational market behaviour. Education and training are required for all stakeholders, and information technology is vital.

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[37] Notably by developing joint support programmes such as JASPERS, JEREMIE and JESSICA for Regions, SMEs and Cities, in combination with the EIB Group, EBRD and other IFIs. .

[38] Directive 2003/96/EC, OJ L 283 of 31.10.2003, p. 51.

Priority Action 8

Raising energy efficiency awareness
Priority areas, besides improved labelling, will include education and training plans and programmes for energy managers in industry and utilities. Included will also be teaching aids for primary, secondary and vocational educational curricula. These will be developed as of 2007 through Community programmes, by recommendations to Member Sates and through co-operation with Member State and Community educational agencies.

Energy efficiency starts at home. The Commission and the other EU Institutions will therefore show leadership by example by demonstrating new, energy-efficient technologies in their buildings, vehicles, office supplies and other energy-using equipment, and adopting procurement guidelines for their services. In applying the Community eco-management and audit scheme (EMAS)[39], the Commission will ensure that all Commission-owned buildings are certified by the end of 2009.

Elsewhere, energy efficiency management schemes will be developed with co-financing from Community programmes such as the CIP.[40] Recipients will elaborate guidelines on how to promote energy-efficient products and provide for education and training plans for energy managers. The Commission will present by the end of 2006 an Environment Programme for SMEs (SME-Environment), including an energy efficiency toolkit, and will develop a Strategic Energy Technology Plan including the contribution to energy efficiency of information and communications technologies.

Priority Action 9

Energy efficiency in built-up areas
A "Covenant of Mayors" will be created by the Commission in 2007 bringing together in a permanent network the mayors of 20-30 of Europe's largest and most pioneering cities. The aim is to exchange and apply best practices thereby improving energy efficiency significantly in the urban environment, where local policy decisions and initiatives are important, including transport.

To provide practical examples of energy efficiency measures and policies, the Commission in the framework of the Sustainable Energy Europe campaign and with support from the Intelligent Energy-Europe Programme will organise a competition in each Member State with a view to award a prize for the most energy-efficient school. The selection criteria for such an award will include energy management and energy performance of the respective school facilities as well as the students` level of knowledge of the subject of energy efficiency and sustainability. The concept of organising a European prize will also be considered.

Further measures are set out in the annex.

5.6. International partnerships

Notwithstanding that energy efficiency starts at home, it is also very much an international issue. The EU should use its bilateral and international trade and development policy, agreements, treaties and instruments (including dialogues) to promote the development and use of energy-efficient technologies and techniques.

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39 **EMAS** was established by Regulation (EC) No 761/2001. OJ, L 114, p. 1 on 24.04.2001.

40 Competitiveness and Innovation Framework Programme 2007-2013. COM(2005)121 final.

Priority Action 10

Foster energy efficiency worldwide
In order to promote energy efficiency worldwide, the Commission will take the initiative in 2007 to reach a framework agreement with key external trading partner countries and international organisations. The agreement will focus on improving energy efficiency in end-use sectors and in energy transformation and will use a large number of policies and measures.

With a view to focussing and strengthening energy efficiency world-wide, the Commission will propose an international framework agreement involving both developed and developing countries, including Brazil, China, India, Japan, Russia and the United States. This will be done in collaboration with the United Nations, the International Energy Agency, G8 (Gleneagles Dialogue on Climate Change), the World Trade Organisation, the World Bank, the EBRD, EIB and other institutions. The aim is to develop closer co-operation on energy efficiency measurement and evaluation, minimum performance requirements for goods and services, labelling and certification, energy audits, stand-by losses, codes of conduct, and more. It should cover all end-use sectors, including transport, as well as energy transformation, where the global potential is particularly large. The Commission will host a major international conference on energy efficiency in 2007 to kick-start the process.

6. Conclusions and next steps

The measures set forth in this Action Plan and in the annex can start producing effects in the next six years, many in the coming three. The progress achieved will be assessed in the framework of the regular Strategic European Energy Reviews[41]. A major mid-term review will take place in 2009 during the implementation of the Action Plan. The savings potential is there. The tools, support programmes, policies and necessary institutional capacity must be brought to bear.

However, more than anything, political will and engagement at national, regional and local level are necessary if the objectives here are to be achieved. Therefore, it is for the Council and the European Parliament and for national and regional policy makers to renew their full commitment and establish a clear and unambiguous mandate to facilitate the implementation of this Action Plan by endorsing it and agreeing on the proposals set forth.

[41] COM(2006)105 final of 8 March 2006.

ANNEX: Proposed Measures[42]

The Commission will take the following measures[43]:

1. Dynamic energy performance requirements for products, buildings and services.

- Implementation of the Eco-Design Directive (2005/32/EC)
  - co-ordinate eco-design requirements, labelling, and incentives (2007-2012)
  - develop eco-design requirements for 14 priority product groups (2007-2009)
- develop eco-design requirements for additional products (2008-2010)
- support self commitments to deliver energy savings (2007-2012)
- implementation and amendment of the Labelling Framework Directive (92/75/EC);
  - propose Commission Directives for energy labelling of gas water heaters and electric water heaters (2007)
  - prepare additional labelling implementing measures and revise existing labels, with a view to re-scale them every 5 years with only 10 – 20 % having A-label status and verifying life-cycle costs and expected energy savings(2007-2009)
  - launch a comprehensive survey on the implementation of the Directive (2007)
- Implementation and amendment of the Energy Star Agreement on office equipment[44]
  - conclude a new 5-year Energy Star Agreement (2007)
  - propose amending Regulation (EC) No 2422/2001 on a Community energy efficiency labelling programme for office equipment (2007)
  - develop stringer energy efficiency criteria for office equipment (2007-2011)
- Implementation and amendment of the Energy End-Use Efficiency and Energy Services Directive (2006/32/EC)
  - prepare a Memorandum of Understanding on energy efficiency in co-operation with CEER through ERGEG (2007)
  - assess a Community-wide White Certificate Scheme (2008)
  - improve coherence of national public procurement guidelines on energy efficiency (2008)

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42 All proposed actions are explained in more detail in the Commission Staff Working Document "Analysis of the Action Plan for Energy Efficiency", SEC(2006)1173.

43 Timing in brackets reflects estimated Commission launch and/or duration of measure.

44 Regulation (EC) No 2422/2001.

– seek agreement on more stringent and harmonised criteria for voluntary agreements to significantly increase energy efficiency (2009)

– issue a mandate for a European norm (EN) for energy audits (2008)

– propose more detailed metering and billing requirements (2009)

– consider supporting or establishing a centre to identify and improve emerging and existing technologies (2008)

- Implementation and amendment of the Energy Performance of Buildings Directive (2002/91/EC)

  – propose an expanded role for the public sector to demonstrate new technologies and methods (2009)

  – propose lowering significantly the threshold for minimum performance requirements for major renovations (2009)

  – propose minimum performance requirements (kWh/m²) for new and renovated buildings and some components with a target for new buildings to approach the level of passive houses[45] from 2015 (2009)

  – consider proposing binding requirements to install passive heating and cooling technologies (by the end of 2008)

  – propose measures for Member States to provide financing for highly cost-effective investments (2009)

- Implementation of the Construction Products Directive (89/106/EEC)

  – introduce energy efficiency aspects in construction product standards whenever relevant (2008)

2. Improving energy transformation

- develop minimum efficiency requirements for new electricity, heating and cooling capacity lower than 20 MW and consider if necessary such requirements for larger production units (2008)

- develop with supply industry guidelines on good operating practices for existing capacity (2008)

- issue a mandate for a European Norm for a certification scheme for heat and electricity plant engineers (2008)

- agree guidelines in co-operation with CEER through ERGEG on good regulatory practices to reduce transmission and distribution losses (2008)

[45] With minimum need for external energy supply for heating and cooling.

- propose a new regulatory framework for the promotion of grid access and connection of decentralised generation (2007)

- Implementation and amendment of the Directive on the Promotion of Cogeneration (CHP) (2004/8/EC), including

  – accelerate harmonisation of the calculation methods for high-efficiency CHP (2008-2011)

  – issue a mandate for a European Norm (EN) for certification of chief engineers for CHP plants (2008)

  – reach agreement on a harmonised electronic Guarantee of Origin (2007-2009)

  – propose stricter requirements for market regulators to promote CHP (2008-2011)

  – propose to require Member States to identify heat demand suitable for CHP (2007-2008)

  – propose that Member States be required to identify in national potentials waste heat potential (2007-2008)

  – propose minimum efficiency requirements for district heating based on new norm (2007-2008)

  – seek to adopt a European Norm and a minimum efficiency requirement for micro CHP (2007-2009)

3. Moving on transport

- measures, including legislation if necessary, to meet through a comprehensive and consistent approach a 120 g CO_2/km target by 2012. This target should be met based on the achievement of a 140 g CO_2/km target through a voluntary agreement by 2008-2009

- strengthen efforts to develop markets for cleaner, smarter, more energy-efficient and safer vehicles, following a Commission proposal for a Directive on the promotion of clean road transport vehicles (COM(2005)634) (2007-2012)

- strengthen EU-wide real-time traffic and travel information (RTTI) systems and traffic management (2007-2012)

- encourage financing for market introduction of efficient vehicles (2007)

- propose an amended Car Fuel Efficiency Labelling Directive (1999/94/EC) (2007)

- issue a mandate for a recognised European Norm and international standard to measure tyre rolling resistance (2008)

- work towards minimum efficiency requirements for automobile air-conditioning systems (2007-2008)

- propose a labelling scheme for tyres (2008)

- facilitate voluntary agreements and propose other measures on accurate tyre pressure monitoring schemes (2008-2009)

- consider compulsory fitting of tyre pressure monitoring systems on new vehicles (2008-2009)

- submit a Green Paper on urban transport putting forward joint solutions based on concrete measures that have been successfully tested, including, if appropriate, infrastructure use and road and congestion charges (2007)

- propose legislation to harmonise requirements to promote fuel efficiency in drivers education curricula and support projects (2008)

- promote energy efficiency in the aviation sector through SESAR[46] (2007-2012)

- propose legislation to include the aviation sector in the EU Emissions Trading Scheme (end of 2006)

- exploit the potential for optimising hull cleaning of ships (2007-2008)

- realise savings benefits of shore-side electricity for harboured ships by proposing legislation (2008-2009)

- promote short sea shipping and the motorways of the sea (2007-2012)

- implement the legal framework for rail transport (2007)

4. Financing energy efficiency, economic incentives and energy pricing

- seek to identify and remove legal barriers in Member States to use ESCOs, and contracting instruments for energy efficiency (2007-2009)

- develop local revolving funds affiliated with information clearing houses, through close cooperation with EBRD, EIB Group and other IFIs (2007-2009)

- facilitate the emergence with EBRD, EIB Group and other IFIs of public-private partnerships to attract funding for debt financing, guarantees and venture capital for SMEs, ESCOs and other enterprises offering energy services (2007)

- facilitate leveraging of financing for energy efficiency projects, including the multifamily and social housing sectors, in the new Member States through the Structural and Cohesion funds (2007-2012)

- promote networking amongst Member States and regions to ensure financing of best practices in energy efficiency (2007-2012)

- promote use of public-private energy efficiency funds and finance packages for SMEs and public sector for energy audits and specific energy efficiency investments identified in energy audits with EBRD, EIB Group and EU Structural and Cohesion funds (2007-2012)

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[46] Single European Sky Air Traffic Management Research project.

- encourage the use of Community financing such as Green Investment Funds, co-financed by CIP, for SMEs in view of promoting eco-innovation solutions (2007-2012)

- consider costs and benefits of tax credits as incentives for enterprises to produce more and better energy-efficient appliances and equipment and for consumers, to promote the purchase of such appliances and equipment (2007)

- prepare a Green Paper on indirect taxation (2007) and, subsequently review the Energy Tax Directive to incorporate better energy efficiency and environmental considerations (2008)

- propose a special tax arrangement for commercial diesel, aiming at narrowing excessive differences in tax levels between Member States in order to increase energy efficiency in the transport haulage sector by reducing "tank tourism" (2007)

- call upon the Council to adopt Commission proposal (COM(2005)261) to relate vehicle taxation to CO_2 performance, and invites Member States to already introduce these modifications into the tax reforms they may be considering (2007)

5. Changing Energy Behaviour

- lead by example by EMAS certifying all Commission buildings (2007-2009) and propose extending to other EU Institutions (2010)

- strengthen energy efficiency guidelines by amending the EMAS regulation (2007)

- adopt energy efficiency Commission procurement guidelines (2008), promote energy management schemes, guidelines on how to promote energy-efficient products, and training toolkits for industry, SMEs and the public sector and present IPPC[47] reference document (2007-2012)

- propose recommendation to Member States for energy security and climate change dimension in national educational curricula (2007); Community programmes will provide relevant information material and teaching guidelines (2007-2012).

- propose a vocational educational initiative on energy efficiency (2008)

- create a “Covenant of Mayors” with an Memorandum of Understanding on energy efficiency for exchange and application of best practices and to set up a permanent network (2007)

- create and operate new networks in Sustainable Energy Europe (SEE) Campaign (2007-2008)

- organise a competition in each Member State with a view to award a prize for the most energy-efficient school (2007 -2008)

[47] Integrated Pollution Prevention and Control Directive (96/61/EC).

- involve the Intelligent Energy-Europe Agency, national, regional and local energy agencies in implementation of Action Plan (2007-2012)

6. International partnerships

- launch an initiative for an International Framework Agreement on Energy Efficiency (2007)

- propose voluntary agreements (commitments) with export industries on information, minimum efficiency requirements and labelling (2007-2012)

- strengthen energy efficiency in energy and trade treaties, agreements, dialogues and other cooperation frameworks (2007-2012)

- increase international co-operation on measurement methods for minimum efficiency requirements and labelling (2007-2012)

- create an international network for dissemination of information and advice on efficient technologies (2009)