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Action Plan for Energy Efficiency: Realising the Potential**

**Executive summary of the Impact Assessment**

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## COMMISSION STAFF WORKING DOCUMENT

### Executive summary of the Impact Assessment Report for the Action Plan for Energy Efficiency 2006

The benefits of improving the European Union's energy efficiency include greater competitiveness of the EU economy, greater energy security, reducing harmful emissions, and allowing the EU to fulfil its Kyoto commitments<sup>1</sup> in a cost effective way. Taking up energy efficiency seriously can put the EU firmly on the road to its goal of a sustainable energy future.

To realise 20% energy savings by 2020 would mean a saving of around 390 million tonnes of oil equivalent (hereinafter Mtoe) by 2020. To make this come true a 3.3% annual energy efficiency improvement is necessary. Adopting and implementing the measures contained in the Action Plan contributes significantly to adding the necessary annual improvement of 1.5% to the assumed annual improvement of 1.8% in the baseline scenario<sup>2</sup> which the Commission uses for its annual estimates on future developments in energy.

To realise the 20% savings potential, significant investments are necessary. However, only cost effective measures are put forward in the Action Plan. Furthermore, many of these investments create greater added value for the EU economy in terms of EU manufacturing, energy, transport and services sector (innovation, research and development) and of job creation than more traditional supply side investments in the energy sector. Investing in energy efficiency measures are safer financial prospects and a no-regret option for the future.

The impact assessment equally indicates that it is likely that the cost effective potential is bigger, as the higher than assumed present oil prices seem to persist for the foreseeable future at least. There is agreement among authoritative energy experts<sup>3</sup> that energy efficiency improvement is the most cost-effective and quickest way to set the global community on the way to a sustainable energy future<sup>4</sup>.

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<sup>1</sup> The Kyoto commitments the EU has signed up to consist in a reduction of CO<sub>2</sub> emissions of 8% by 2012, compared to emissions in 1990

<sup>2</sup> PRIMES is the modelling tool developed for the energy forecasts published regularly by the Commission. The version of PRIMES used by the consultants in their study for the Impact Assessment is based on is the same version as the one underlying the Green Paper on Energy Efficiency. The details of the new PRIMES version were unavailable. The new version assumes higher policy induced savings and higher autonomous improvement and is taken as starting point for this paragraph and the Action Plan itself.

<sup>3</sup> PRIMES, International Energy Agency, International Panel on Climate Change, Energy Modeling Forum, e.g.

<sup>4</sup> The Conclusions of the G8 meeting at St Petersburg of 16 July equally state: 'Energy saved is energy produced and is often a more affordable and environmentally responsible option to meet the growing energy demand ... thus strengthening global energy security'. The Conclusions continue by mentioning actions to be undertaken in several areas equally pointed out in the impact assessment process (stringent standards for appliances and tyres, taking tax

An extra effort mobilising all actors to realise a further 1.5% energy efficiency improvement per year, induced by a mix of policies, is thus necessary. The Commission's Action Plan for Energy Efficiency brings forward the actions that are to be realised or initiated in the period 2007-2012. Further actions will be necessary to realise the full 20% by 2020.

The impact assessment provides data which allow for quantification of the effects of the actions proposed. Nonetheless, it should be noted that some uncertainty on the quantitative estimates exists, due the fact that improving energy efficiency is such a wide ranging topic, involving all levels of policy and decision makers<sup>5</sup>.

Monetary savings estimated for the EU economy would be around 50 billion euros annually by 2012; this would increase substantially - to more than 100 billion euros<sup>6</sup> - by 2020. This savings estimate reaches 150 billion € per year by 2020 if oil prices of 70\$/barrel were taken as starting point. These savings would have to be reinvested in the European economy for a large part.

The carbon emissions savings estimated if the full 20% savings are realised are around 780 million tonnes of CO<sub>2</sub>.

Security of supply benefits are directly deduced from the Mtoe savings for the EU as a whole<sup>7</sup>. This cannot be extrapolated to mean the same benefit for the individual Member States in the same sense, due to differences in fuel mix and in policy framework.

The impacts of the individual actions proposed in the Action Plan vary considerably on the key indicators chosen, such as savings in Mtoe, cost effectiveness, competitiveness impact and administrative costs. In the impact assessment process the possible overlap between actions has been estimated, but the reinforcing effects of the right mix of policy measures on different actions have not been estimated with as much detail.

The policy options are discussed in Chapter 4 of the Impact Assessment Report and range from different forms of voluntary agreements, public sector leadership, market based instruments, regulatory measures at EU/national/regional and local level, financing options through to information, training and education activities. The option that consist of taking no additional action on top of the improvement assumed in the baseline, has not been retained as it would not lead to additional energy savings with the ensuing benefits. The actions that have been retained for further analysis complement each other to some extent. It is clear that for such a wide ranging Action Plan, not one single option can be chosen as the best policy option. The EU cannot rely on EU regulatory measures alone, since mobilisation of all actors is sought. The EU cannot rely on purely voluntary agreements alone, as their track record is patchy.

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and financial measures, demonstrate leadership at national level and raise public awareness, and working with International Financing Institutions to broaden the scope of the actions.

<sup>5</sup> Decision makers in the framework of this Report are all users of energy, from industry, all levels of authorities to children, who can change their energy behaviour and therefore energy use in the EU as a whole.

<sup>6</sup> Reference is 48 USD/barrel net of taxes.

<sup>7</sup> No distinction is being made between fossil fuel exporting and importing Member States.

On nearly every single action a mix of policy options is required. Incentives, be they financial or more in the form of raising awareness and exchange of best practices are important complementary policies. This approach has guided the further analysis of the options.

In line with the Impact Assessment Guidelines<sup>8</sup> this impact assessment has been based on a broad analysis. The Inter Service Steering Group established for the impact assessment decided to carry out a multi criteria assessment on the basis of 24 non weighted criteria to assess 54 actions established in the first phase of the process.

A relatively simple<sup>7</sup> point scoring system was adopted ranging from high positive impact (+3) to high negative impact (-3). Each retained option is supported by reference material. In addition an estimation of Mtoe savings per action is made.

In the second phase of the assessment process the Inter Service Steering Group selected 18 most promising actions to be assessed using the 24 criteria. In addition these actions were assessed using five major criteria, decided upon by the Inter Service Steering Group: 1) security of supply in the form of quantified energy savings in Mtoe; 2) cost effectiveness; 3) impact on harmful emissions; 4) administrative costs on business and 5) persistence of the measure. Competitiveness and impact on innovation were also looked at in more detail, but were not scored separately in the second phase.

The options are examined on a purely technical basis and do not include any further political consideration as to their acceptance. Therefore, this analysis does not prejudge the political choices made by establishing the Action Plan itself. These 18 options, with their scoring and estimated energy savings are given in the table below:

| <b>Option Reference</b> | <b>Option Description</b>   | <b>Potential Energy Savings (Mtoe)</b> | <b>Criteria Score (Major Criteria)</b> | <b>Criteria Score (All Criteria)</b> |
|-------------------------|---|--|--|--------------------------------------|
| <b>1</b>                | EU to develop scheme recognising retailers providing information on energy efficiency by allowing public recognition through logo or certification scheme.                                  | <b>6</b>                               | <b>5</b>                               | <b>20</b>                            |
| <b>2</b>                | EU to encourage Member States to include energy efficiency training and information in national education curriculum for primary and secondary schools as part of sustainability awareness. | <b>10</b>                              | <b>9</b>                               | <b>21</b>                            |
| <b>3</b>                | EU to include running costs in Energy Efficiency Product Listing / labelling or equivalent consumer information   | <b>18</b>                              | <b>8</b>                               | <b>28</b>                            |
| <b>4</b>                | EU/MS to extend EPBD to include smaller buildings (<1000 m <sup>2</sup> ), inspection requirements to smaller installations and higher minimum standards for public buildings               | <b>80</b>                              | <b>5</b>                               | <b>18</b>                            |
| <b>4a</b>               | EU/MS to extend the concept of white certificate schemes, after evaluation of present national schemes, to all EU-countries and implement obligations on energy suppliers to provide energy | <b>60</b>                              | <b>3</b>                               | <b>19</b>                            |

<sup>8</sup> SEC(2005) 791, page 8

| <b>Option Reference</b> | <b>Option Description</b>  | <b>Potential Energy Savings (Mtoe)</b> | <b>Criteria Score (Major Criteria)</b> | <b>Criteria Score (All Criteria)</b> |
|-------------------------|--|--|--|--------------------------------------|
|                         | efficiency   |  |  |                                      |
| <b>5</b>                | EU to adapt appliance label regulation as to regular updating of the label system, in order to stimulate the marketing of ever more efficient appliances, and extend the system to other devices.  | <b>2</b>                               | <b>4</b>                               | <b>14</b>                            |
| <b>6</b>                | EU/MS to set up regulation and/or incentives to increase the average conversion efficiency per fuel type, by installing new plants with best available technology (BAT)  | <b>20</b>                              | <b>5</b>                               | <b>15</b>                            |
| <b>7</b>                | EU/MS to promote/require regulatory change towards facilitation of penetration of "off-grid" power generation – many obstacles to be removed through different measures  | <b>16</b>                              | <b>7</b>                               | <b>31</b>                            |
| <b>8</b>                | EU/MS to promote/require regulatory change towards facilitation of penetration of "grid-connected" CHP, via different measures   | <b>14</b>                              | <b>8</b>                               | <b>33</b>                            |
| <b>9</b>                | EU to introduce new CEN STANDARD to regulate district heating systems  | <b>2</b>                               | <b>6</b>                               | <b>28</b>                            |
| <b>10</b>               | EU to incentivise the use of intermediaries for small energy efficiency loans etc, for example by extending access to ECB or (through Energy Services Directive obligation) MS capital as a revolving fund for "soft loans"  | <b>13</b>                              | <b>8</b>                               | <b>27</b>                            |
| <b>11</b>               | EU/MS to increase policy support for ESCOs through (1) dissemination of their activities, (2) the development of EU wide quality standards for ESCO projects, (3) standardised project monitoring and verification schemes, (4) model contracts and (5) improve access to (private) financial sources (e.g. cooperation with private banks). These measures could be combined with providing low-interest loans to ESCO projects | <b>&lt;6</b>                           | <b>4</b>                               | <b>13</b>                            |
| <b>12</b>               | EU to incentivise production of energy efficient products through favourable taxation rate in Member States  | <b>15</b>                              | <b>4</b>                               | <b>12</b>                            |
| <b>13</b>               | EU/MS to make driving costs more km depending. For instance the car or road tax can be made variable. Finally area and congestion charges used for traffic management also have a km reduction effect.   | <b>3 to 15</b>                         | <b>8</b>                               | <b>13</b>                            |
| <b>13a</b>              | EU to: 1) Set maximum CO <sub>2</sub> emission standards for different type of cars (absolute, related to specific performance properties, or related to the mean value of all cars sold by one company). 2) Make more stringent agreement with car and truck producers after 2008-2009.   | <b>28</b>                              | <b>4</b>                               | <b>12</b>                            |
| <b>13b</b>              | EU/MS to restrict unnecessary power of car engines by technical devices like maximum speed limiters and/or limitation of maximum acceleration. Or limit the maximum power related to   | <b>11</b>                              | <b>2</b>                               | <b>5</b>                             |

| <b>Option Reference</b> | <b>Option Description</b>  | <b>Potential Energy Savings (Mtoe)</b> | <b>Criteria Score (Major Criteria)</b> | <b>Criteria Score (All Criteria)</b> |
|-------------------------|--|--|--|--------------------------------------|
|                         | the vehicle weight (or maximum load) for new cars and trucks.  |  |  |                                      |
| <b>13c</b>              | EU/MS to decrease fuel use by making fuel more expensive. By making the differences between countries less, the incentive of buying cheap fuel across the boarder will decrease. Secondly a lower car tax can be introduced when an efficient car is bought or a financial penalty, which make the buying of a less efficient (second hand) car much more expensive. Thirdly a bigger difference in road tax related to the fuel consumption of a car can be introduced. Even a km charge can be fuel economy dependent. | <b>22</b>                              | <b>10</b>                              | <b>17</b>                            |
| <b>14</b>               | An EU broad policy for labelling fuel efficient tyres or minimum performance requirements for tyres, tyre pressure indicators (dashboard tyre pressure sensors mandatory on cars and freight vehicles, valve pressure indicators compulsory on existing vehicles tyres from 2010) and free facilities at service stations.   | <b>15</b>                              | <b>6</b>                               | <b>11</b>                            |

The aggregate primary savings potential for fully implemented policy options in the year 2020 are between 341 and 353 Mtoe below the baseline projection of 1885 Mtoe in 2020.

The impacts of the various options differ in terms of energy savings they can deliver, their cost-effectiveness, their impact on competitiveness and administrative costs and other effects. It is not possible to establish a definitive ranking of priorities, but nonetheless the following general conclusions should be noted.

For each action on the priority-list the savings potential has been estimated. This saving figure is valid for situations where the chosen action is applied in isolation of other actions.

However, in the Action Plan a large part of these actions will be present. This will probably cause interaction, meaning that the sum of the savings potentials of two separate actions is not the same as the combined savings effect. Often this implies an overlap, where the combination provides fewer saving than the two actions apart. However, in some cases two actions reinforce each other's effect.

For example, a preliminary analysis shows that Option 4 (extension of the Energy Performance of Buildings Directive) strongly overlaps and interacts with Option 4a (EU wide use of white certificates). It equally shows that Option 2 (Integration of energy efficiency in national school curricula) positively impacts on other awareness raising actions which aim at accelerating the rate of market transformation, such as labeling. Option 3 (inclusion of running costs on labels) and option 14 (labeling of tyres) provide for a reinforcing combination with a number of other actions.

Taking into account the separate policy options overlap the gross estimated aggregate energy savings potential estimate reduces by 26% to 262 Mtoe in year 2020.

This is approximately a 14% potential energy saving on the year 2020 projected primary energy consumption of 1885 Mtoe. However, this does not take fully into account the reinforcement effects of different policy options, especially the positive effects of incentives and enforcement of decisions. Time and budgetary constraint did not allow for a detailed assessment of the reinforcement effects. In addition, the Action Plan itself does not promise to reduce energy consumption by 20% in 2020. More actions will be necessary after the Action Plan period.

If the possible savings of the 54 options considered during the second phase of the impact assessment process were all added up, they would generate savings in the order of 700 Mtoe. It has to be noted, however, that the overlap between the 54 actions are necessarily much higher than between the 18 actions considered for more in depth analysis, and that implementation barriers are equally higher for many of these actions.

Any of the actions identified in the Action Plan that will be put on the Commission Legislative Work Programme, will be subject to a separate impact assessment.

The clear conclusion of the impact assessment process is that not one single policy, be it a regulatory, a voluntary approach, or an approach geared towards raising awareness, would be sufficient to reach the potential. On the basis of this Impact Assessment, the EU can now confidently move from problem and barrier identification to a vigorous pursuit of the solution: a balanced mix of policy options as formulated in the Action Plan.

The most important determining factor in the success of the implementation of the Action Plan is the full engagement of all policy<sup>9</sup>, and decision makers to make the step change in energy use necessary to reap the full benefits of improved energy efficiency.

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<sup>9</sup> A preliminary, yet conservative estimate for the Commission services alone would be a requirement of additional staff of 20 officials if a success is to be made of the Action Plan.