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**COMMISSION STAFF WORKING DOCUMENT**

**EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT**

*Accompanying the document*

**Proposal for a Commission Regulation**

**implementing Directive 2009/125/EC with regard to ecodesign requirements for water pumps**

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### EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT

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#### **Proposal for a Commission Regulation**

#### **implementing Directive 2009/125/EC with regard to ecodesign requirements for water pumps**

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**Lead DG:** ENER

**Associated DG:** ENTR

**Other involved services:** SG, LS, ENV, COMP, ECFIN, INFSO, MARKT, SANCO, TRADE, RTD

#### **EXECUTIVE SUMMARY**

The Ecodesign Framework Directive lists products identified by the Council and the European Parliament as priorities for the Commission for implementation. The Spring Council 2007 called for thorough and rapid implementation of the five priorities<sup>1</sup> set by the Energy Council on 23 November 2006<sup>2</sup>, based on the Commission's Action Plan on Energy Efficiency. One of those priorities is to 'dynamically and regularly improve and expand the scope of minimum efficiency requirements for energy-related products' by fully utilising the Ecodesign Directive, to include appliances in motor-driven systems, such as motors, drives, pumps and fans (Article 16). Pumps are thus one of the priority product groups considered for implementing measures under the Ecodesign Directive. The need to quickly come up with minimum energy performance requirements for these devices was emphasised in Article 16(2) of the Ecodesign Directive and supported by Member State representatives and stakeholders in the Consultation Forum.

The approach to developing the proposed ecodesign implementing measure for water pumps and its impact assessment was structured in four steps:

Step 1: assessment of the criteria for an ecodesign implementing measure as set out in Article 15(2)(a)–(c) of the Ecodesign Directive, taking into account the ecodesign parameters listed in Annex I to the Ecodesign Directive;

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<sup>1</sup> Brussels European Council 8/9 March 2007, Presidency Conclusions, 7224/07.

<sup>2</sup> TTE (Energy) Council on 23 November 2006, 15210/06.

Step 2: consideration of relevant EU initiatives, market forces and disparities in the environmental performance of equipment on the market with equivalent functionality, as set out in Article 15(2) of the Ecodesign Directive;

Step 3: establishing policy objectives, including the desired level of ambition, the policy options to achieve the objectives, and the key elements of the ecodesign implementing measure as required by Annex VII to the Ecodesign Directive;

Step 4: environmental, economic and social assessment of the impacts on the environment, consumers and industry, with a view to the criteria for implementing measures set out in Article 15(5) of the Ecodesign Directive.

## 0 Step 1

In order to assess the criteria for ecodesign implementing measures as set out in Article 15(2) of the Ecodesign Directive, the Commission has carried out a technical, environmental and economic analysis ('preparatory study') of water pumps<sup>3</sup>, following the provisions of Article 15(4)(a) of the Ecodesign Directive and its Annexes I and II. The study has shown that (1) water pumps are placed in large quantities on the EU market, (2) the environmental impact of their life-cycle energy consumption and their electricity consumption is significant, (3) there is a wide disparity in the environmental impacts of water pumps currently on the market, and technical cost-effective solutions exist that could lead to significant improvements. The criteria are fully met by the water pumps considered in this impact assessment.

The water pumps covered are used in clean water pumping. The preparatory study excluded pumps used in other applications, such as chemical and petrochemical processes, high-temperature heating systems with water or oil as a heat transfer liquid, energy production, etc. Small domestic shower, garden pond and rain water pumps are also excluded. Glandless heating circulators are excluded but are covered by the separate Lot 11 Circulator study. Only glanded<sup>4</sup> water pumps are considered in this impact assessment, as glandless pumps ('circulators') used in heating applications and in the secondary circuits of cooling distribution systems were part of a separate impact assessment.

With regard to the criteria set out in Article 15(2) of the Ecodesign Directive, the preparatory study has established the following results for water pumps covered by this impact assessment, within the EU:

**Table 1: Criteria of Article 15(2) of the Ecodesign Directive as applied to water pumps**

<b>Article 15(2)(a):</b>	<b>Annual sales volume in the EU</b>	<b>1.6 million units in 2005 1.9 million units in 2020</b>
<b>Article 15(2)(b):</b>	<b>Environmental impact: energy consumption of pumps (BaU)</b>	<b>109.1 TWh in 2005 136.2 TWh in 2020</b>

<sup>3</sup> 'Preparatory studies for Ecodesign Requirements of Ecodesigns — Lot 11 on electric motors, water pumps, pumps in buildings and fans for ventilation in non-residential buildings. Appendix 6: Lot 11 — 'Water Pumps (in commercial buildings, drinking water pumping, food industry, agriculture)' Issue Number 6, 8 April 2008, available on Eco Motors website: [http://www.ecomotors.org/files/Lot11\\_pumps\\_1-8\\_%20issue6\\_110408\\_%20final.pdf](http://www.ecomotors.org/files/Lot11_pumps_1-8_%20issue6_110408_%20final.pdf).

<sup>4</sup> 'Dry running' pump (the rotor of the pump is outside the pumping medium).

<b>Article 15(2)(c):</b>	<b>Improvement potential (savings by applying cost-effective existing technology). Sub-option 2</b>	<b>2.8 TWh in 2020</b>
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The latest Europump<sup>5</sup> data on sales volumes from 2005 show an annual sales volume of 1.6 million units. A relatively small increase of 1.5 % per year is expected, leading to a sales volume of 1.9 million units in 2020.

The most significant environmental aspect of water pumps is their life-cycle energy consumption. However, impacts due to production and distribution are minor compared to the impact during use. The use-phase electricity consumption of water pumps can be reduced significantly and cost-effectively.

Compared to a business as usual (BaU) scenario, it is estimated that the proposed regulation (sub-option 2) will lead to annual use-phase electricity savings of about 2.8 TWh by 2020 in the EU, corresponding to an annual reduction of 1.3 million tonnes in CO<sub>2</sub> emissions. These savings must therefore be considered significant.

The improvement potential is due to the fact that cost-effective technical solutions and products already exist on the market, but their market share is low (20% of all water pump models in 2005).

## 0 Step 2

Further to Articles 15(2) and 15(4)(c) of the Ecodesign Directive, relevant EU and national environmental legislation is considered. Related (voluntary) initiatives at both EU and Member State level are taken into account and market failures preventing the market take-up of technologies with improved environmental performance are analysed.

The Ecodesign Directive implies that legislative action on water pumps cannot be taken at Member State level, and the Member States expect a harmonised legislative framework to be set, the legal basis being Article 95 of the Treaty.

Several market failures have been identified to explain why cost-effective technologies leading to energy efficiency improvements are not penetrating the market to a satisfactory extent as a result of market forces alone. Firstly, not all environmental costs are included in electricity prices. Consequently, consumer (and producer) choices are made on the basis of lower electricity prices that do not reflect environmental costs for society (negative externality).

Moreover, the main barrier preventing consumers opting for energy-efficient water pumps is the fact that they are not in a position to take into account the full life-cycle cost of the pump. The purchase price is quite visible and typically higher for energy-efficient water pumps. On the other hand, information on running costs and cost savings is not explicit and can be obtained only with difficulty (asymmetric information).

As a result, manufacturers have no incentive to reduce the energy consumption of these devices, even though this could be done at a reasonable additional cost to the manufacturer and would bring about significant savings for the consumer and reduced CO<sub>2</sub> emissions.

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<sup>5</sup> The European Association of Pump Manufacturers.

Finally, practically all water pumps are installed by professional installers, who do not pay the electricity bill for the use of the pump, which makes the purchase or selling price the main priority rather than the life-cycle cost (split incentives).

Due the identified market failures, the cost-effective improvement potential is not realised. This is further discussed in section 2.

## 0 Conclusions of Steps 1 and 2

Over the coming years, the number of water pumps sold in the EU and the associated energy consumption will continue to grow modestly. However, their energy consumption will remain high due to the high number of pumps in use. Existing cost-effective solutions to reduce the energy consumption of these devices are not applied because of the market failures outlined above. In the light of the significant savings potential, and in the absence of EU action, there is a risk that possible future initiatives at Member State level could hamper the free circulation of these products within the internal market.

It is concluded that the criteria for ecodesign implementing measures as set out in Article 15(2) of the Ecodesign Directive are met, and that water pumps should be covered by an ecodesign implementing measure in accordance with Article 15(1) of the Ecodesign Directive.

## 0 Step 3

Annex II to the Ecodesign Directive provides that the level of ambition for improving environmental performance and electricity consumption is to be determined by an analysis of the least life-cycle cost (LLCC) for the end-user. Furthermore, benchmarks for technologies yielding best performance, as developed in the preparatory study and in the discussions with stakeholders during the meeting of the Ecodesign Consultation Forum<sup>6</sup> on 29 May 2008, are considered. The minutes of this meeting, where relevant for this product group, are attached in Annex I. The results are reflected in the objectives that the proposed regulation aims to achieve.

The objective of the proposed implementing regulation is to trigger a market transformation to realise the improvement potential. Several policy options have been considered, including **self-regulation, mandatory energy labelling** and **mandatory minimum energy performance requirements**. This is discussed in section 3. However, given the mandate from the legislator to establish ecodesign requirements for pumps, the depth of the analysis for options other than an ecodesign implementing measure is proportionate; the focus is on assessment of the proposed implementing regulation. This is discussed in the first part of section 4.

## 0 Step 4

An assessment of the proposed implementing measure has been carried out. In particular, sub-options for ecodesign requirements in several stages are analysed, taking into account the criteria set out in Article 15(5) of the Ecodesign Directive, and the impacts on manufacturers,

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<sup>6</sup> The Consultation Forum is a balanced grouping of Member State representatives and stakeholders, such as industry, consumer bodies and environmental NGOs, called upon to express their views.

including SMEs. This is discussed in section 5. The four sub-options considered relate to cut-off levels<sup>7</sup>, following the preparatory study and stakeholder comments, and are as follows:

Sub-option 1. Cut-off level 10 % by 2013 and 30 % by 2014;

Sub-option 2. Cut-off level 10 % by 2013 and 40 % by 2014;

Sub-option 3. Cut-off level 20 % by 2013 and 50 % by 2014;

Sub-option 4. Cut-off level 40 % by 2013 and 70 % by 2015.

The tables below show the life-cycle costs and level of savings with the sub-options as against the discarded BaU.

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<sup>7</sup> 'Cut-off level' refers to the proportion of current pump types (not of actual pumps) to be removed from the market by the given dates.

**Table 2: Savings from sub-options**

Electricity savings 2020 in TWh vs BaU			
	Use	Savings	
	TWh/a	TWh/a	%
BaU	136.2	-	-
Sub-opt. 1: 10% cut-off in 2013, 30% cut-off in 2014	<b>133,7</b>	<b>2,5</b>	1.8
Sub-opt. 2: 10% cut-off in 2013, 40% cut-off in 2014	<b>133,4</b>	<b>2,8</b>	2.1
Sub-opt. 3: 20% cut-off in 2013, 50% cut-off in 2014	<b>133,0</b>	<b>3,2</b>	2.3
Sub-opt. 4: 40% cut-off in 2013, 70% cut-off in 2015	<b>131,6</b>	<b>4,6</b>	3.4
Expenditure savings 2020 in EUR (inflation-corrected) vs BaU <sup>8</sup>			
	Expenditure <sup>9</sup>	Savings	
	bln EUR/a	bln EUR/a	%
BaU	<b>19.4</b>	-	-
Sub-opt. 1: 10% cut-off in 2013, 30% cut-off in 2014	<b>19.1</b>	0.3	1.5
Sub-opt. 2: 10% cut-off in 2013, 40% cut-off in 2014	<b>19.1</b>	0.3	1.5
Sub-opt. 3: 20% cut-off in 2013, 50% cut-off in 2014	<b>19.1</b>	0.3	2.0
Sub-opt. 4: 40% cut-off in 2013, 70% cut-off in 2015	<b>19.0</b>	0.4	2.6
Carbon (CO <sub>2</sub> equivalent) savings 2020 vs BaU			
	Use phase	Savings	
	Mt CO <sub>2</sub> eq/a	Mt CO <sub>2</sub> eq/a	%
BaU	62.4	-	-
Sub-opt. 1: 10% cut-off in 2013, 30% cut-off in 2014	<b>61,2</b>	<b>1,2</b>	2.1
Sub-opt. 2: 10% cut-off in 2013, 40% cut-off in 2014	<b>61,1</b>	<b>1,3</b>	2.1
Sub-opt. 3: 20% cut-off in 2013, 50% cut-off in 2014	<b>60,9</b>	<b>1,5</b>	2.4
Sub-opt. 4: 40% cut-off in 2013, 70% cut-off in 2015	<b>60,3</b>	<b>2,1</b>	3.4

<sup>8</sup> Weighted average electricity price in the EU in 2005: €0.082/kWh (consists of €0.075/kWh for industry and €0.135/kWh for domestic use.). Weighted by 89% sold to industry and 11% sold for domestic use.

<sup>9</sup> Includes capital and operating costs, plus installation costs.

**Table 3: Life-Cycle Cost (LCC)**

<b>Scenario</b>	<b>LCC in 2025 in EUR billion</b> (total consumer expenditure 2005-2025, inflation-corrected)
BaU	357,3
Sub-opt. 1: 10 % cut-off in 2013, 30 % cut-off in 2014	354,1
Sub-opt. 2: 10 % cut-off in 2013, 40 % cut-off in 2014	353,8
Sub-opt. 3: 20 % cut-off in 2013, 50 % cut-off in 2014	353,4
Sub-opt. 4: 40 % cut-off in 2013, 70 % cut-off in 2015	352,5

The highest savings are with sub-option 4. However, to achieve the additional savings of 2.0 TWh by 2020 compared to sub-option 2, sub-option 4 would more than double the redesign costs for industry. In the present economic situation, this is considered too expensive for the additional savings to be gained. Instead, a significant part of these additional savings could be achieved by sub-option 2 plus a requirement to provide information on the relative efficiency of pumps, in particular given the low increase in purchase price. Sub-options 3 and 4 only slightly improve the LLCC compared with sub-option 2 and have no further positive impact on employment.

## 0 Conclusions of Step 3 and 4

A comparison of options (sub-options of the option for an ecodesign implementing measure) shows that the appropriate policy choice for realising the improvement potential of pumps is the sub-option 2 with a Commission Regulation setting ecodesign requirements in two stages, with requirements entering into force about one year and then two years after adoption of the regulation. This approach ensures that:

- cost-effective potentials to improve the electricity consumption of pumps are quickly realised, leading to significant electricity and CO<sub>2</sub> savings in the EU as well as reduced life-cycle costs of these devices for consumers;
- by 2020, the annual electricity consumption of pumps will be reduced by 2.8 TWh compared to a business-as-usual scenario and with annual electricity savings reaching 4.2 TWh by 2025, when the pump life of 11 years has yielded the full savings. CO<sub>2</sub> emissions will be reduced by 1.3 Mtoe,;
- enough time, until the end of 2012, is provided for pump manufacturers to increase the production of more efficient pumps, leading to the phase-out of 10 % by 2013 and 40 % by 2014 of pump models currently on the market;
- a marketing tool for high-efficiency pumps is provided for the forerunner industry in the form of an information labelling requirement, which will help guide end-users and installers towards more efficient pumps;
- the specific mandate from the legislator is respected;
- a clear legal framework providing a level playing field for manufacturers is put in place, ensuring fair competition and free circulation of products;



- requirements for pumps are harmonised in the European Union, minimising administrative burdens and costs for economic operators;
- disproportionate burdens for manufacturers are avoided due to transitional periods which duly take into account redesign cycles;
- by 2020, employment will grow marginally from 67 400 to 67 500 workers compared with BaU;
- additional energy savings outside the EU27 are possible given that other economies may decide to follow the EU example (such a development has already been triggered by the minimum requirements introduced in China in 2005);
- increased competitiveness of EU industry on the global market due to more efficient water pumps;
- no negative impact on trade given the level playing field for the global pump industry in the EU market.

As explained in section 6, the impacts will be monitored mainly through market surveillance carried out by Member State authorities to ensure that the requirements are met, whereas the appropriateness of the scope, definitions and concepts will be monitored through an ongoing dialogue with stakeholders and Member States.