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COMMISSION STAFF WORKING DOCUMENT

Summary Impact Assessment

Accompanying the document

Proposal for a Commission Regulation

**implementing Directive 2009/125/EC of the European Parliament and of the Council
with regard to ecodesign requirements for air conditioners and comfort fans**

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implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air conditioners and comfort fans

Lead DG: DG ENER

Associated DG: DG ENTR

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

EXECUTIVE SUMMARY

The Ecodesign Directive 2009/125/EC of the European Parliament and of the Council lays down a framework for the Commission, assisted by a Regulatory Committee, to set eco-design requirements for energy-related products.

Air conditioners are currently addressed in Commission Directive 2002/31/EC implementing Council Directive 92/75/EC with regard to energy labelling of household air conditioners. Unlike in other major economies, air conditioners are not subject to minimum energy efficiency requirements in the EU.

On comfort fans, the preparatory study showed that setting of ecodesign or energy labelling requirements was impossible due to insufficient quality of data. As a solution, minimum energy efficiency requirements were proposed on the basis of the requirements set in China. However, the impact assessment showed that required efficiency levels are unattainable when measured on the basis of the IEC60879:1986 (corr. 1992) standard; the levels proposed by the preparatory study would risk banning most of these appliances in the European market. However, it is possible to set information requirements on comfort fans for the indication of the measured efficiency of the appliance and the measurement standard used. The information generated thereby will help to overcome the knowledge gap in order to be able to set possible ecodesign and/or energy labelling requirements in the future. Also, it will help market surveillance. For these reasons, comfort fans are not dealt with further in this impact assessment summary.

The approach for developing the proposed ecodesign implementing regulation for air conditioners and its impact assessment was structured in four steps:

Step 1: assessment of the criteria for an ecodesign implementing measure as laid out in Article 15(2a)-15(2c) of the Ecodesign Directive, taking into account the ecodesign parameters

identified in Annex I of the Ecodesign Directive and the method for setting specific requirements laid down in Annex II of the Ecodesign Directive;

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

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

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

Step 1: Legal base for an implementing measure: compliance with the Ecodesign Framework Directive, Article 15

In order to assess the criteria for eco-design implementing measures as laid out in Article 15(2) of the Ecodesign Directive, the Commission has carried out a technical, environmental and economic preparatory study on air conditioners¹ following the provisions of Article 15(4a) and Annexes I and II of the Ecodesign Directive.

The study has shown that (1) air conditioners are placed on the EU market in large quantities, (2) the environmental impact related to the life cycle energy consumption and electricity consumption of air conditioners is significant, (3) there is a wide disparity in the environmental impacts of air conditioners currently on the market, and technical cost-effective solutions exist that could lead to significant improvements. The criteria are fully met by air conditioners. Appliances covered include movable and non-movable air-to-air split, multi-split and packaged units, including double duct, window, wall and single duct units, up to 12 kW output power. Furthermore the study and the stakeholder consultation showed that possible refrigerant leakages and sound power levels of air conditioners are relevant environmental parameters.

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

Table 1: Total air conditioners in EU-27 in 2005, 2020 and 2025

| | | |
|---------------|---|--|
| Article 5(2a) | Annual sales volume in the EU | 2005: 4.7 million units per year, representing an economic value of 7.9 billion EUR (total purchase cost). 2020: 9 million units per year, representing 16 billion EUR. |
| Article 5(2b) | Environmental impact: energy consumption of appliances (BaU) | 2005: 30 TWh/y or 14 Mt/a CO ₂ equivalent ² . 2020: 74 TWh/y or 37 Mt/a CO ₂ equivalent. 2025: 88 TWh/y or 46 Mt/a CO ₂ equivalent. |
| Article 5(2c) | Improvement potential of appliances (applying existing cost-effective technology) | 2 - 13 TWh by 2020 in comparison to BAU, depending on the sub-option considered. In 2025, the potential for energy savings increases to 3-16 TWh/y. |

¹ http://ec.europa.eu/energy/efficiency/studies/ecodesign_en.htm.

² This represents 1% of the total EU electricity consumption of about 2760 TWh in 2005.

Step 2: Existing initiatives and capacity of market forces to address the issue

Further to Articles 15(2) and 15(4c) of the Ecodesign Directive, relevant EU and national environmental legislation is considered. Voluntary initiatives are taken into account and barriers preventing market take up of technologies with improved environmental performance leading to market failures are analysed.

The current Commission Directive 2002/31/EC on air conditioners has achieved in the last six years an energy efficiency improvement of 32%³. However, due to the low efficiency level for 'A' for split units the label can not anymore guide consumers towards the most efficient appliances.

In the past, Eurovent Certification established a voluntary agreement but never implemented it, as almost all manufacturers of air conditioners are located outside the EU. The EU Ecolabelling scheme (2007/742/EC) has established criteria for air conditioners, but currently no air-to-air air conditioner has been awarded a label. Due to the outdated labelling scheme and non-existent voluntary action there are no market incentives to further improving energy efficiency of air conditioners.

Not all environmental costs are included in electricity prices. Consumer choice is made on the basis of the purchase price mainly and since the low electricity price is not reflecting environmental costs for the society, consumers are not able to consider the full life-cycle cost of the air conditioner (**negative externality**).

Most consumers base their choice of equipment rather on purchase price and other factors like availability, service and 'trusted' brand names than energy cost. Consumers do not realise that energy cost can be up to 70%-90% of total life cycle cost, which includes purchase, installation and maintenance (**asymmetric information**).

In addition, there are situations where the purchaser does not pay the electricity bill generated by the use of the appliance (such as landlord buying the appliance and tenant paying the electricity bill), which makes the purchase/selling price the first priority rather than the running cost (**split incentives**). Consequently, the improvement potential is not realized. This is further discussed in Section 2.

Although the energy consumption of an average air conditioner has decreased during the last 6 years, it remains modest in comparison with other markets. Stakeholders, including the industry and consumer organisations, have asked unanimously for a combined introduction of ecodesign requirements and a revised labelling scheme for air conditioners.

It is concluded from the first two steps that the criteria for ecodesign implementing measures as set out in Article 15(2) of the Ecodesign Directive are met, and air conditioners should be covered by an ecodesign implementing measure pursuant to Article 15(1) of the Ecodesign Directive complemented by an upgraded energy labelling scheme.

Step 3: Policy objectives and levels of ambition

³ In 1999 (EERAC Study), average efficiency of air conditioners (except single and double ducts) was EER 2.5. In 2010, the average efficiency is estimated to EER 3.3.

The Annex II of the Ecodesign Directive provides that the level of ambition for improving the environmental performance and electricity consumption be determined by an analysis of the least life cycle cost for the user of equipment. Furthermore, benchmarks for technologies yielding best performance are considered as developed in the preparatory study and the discussions with stakeholders during the meetings of the Ecodesign Consultation Forum⁴ on 22 June 2009 and 23 April 2010. The minutes of these meetings are attached in Annex 1. The results are reflected in the objectives that the proposed regulation aims to achieve.

The general objective of the proposed delegated Regulation on energy labelling is to correct the regulatory and market failures. The specific objectives are to remove least efficient products from market, to promote market take-up of more energy efficient air conditioners and to provide incentive for manufacturers for the investments on appliances with low-GWP refrigerants. The operational objectives are to address the problems resulting from the current labelling scheme and comply with the requirements laid down in the Ecodesign Directive, Article 15.

The options analysed are a revised energy labelling only, ecodesign requirements only and a combination of an ecodesign and energy labelling measure. The latter is considered in three different combinations of introductory dates building on stakeholder preferences. As to voluntary agreements, industry has stated its preference for regulatory measures.

The options take into account the criteria set out in Article 15(5) of the Ecodesign Directive and the impacts on manufacturers including SMEs. The considered options and sub-options are as follows:

- (1) **BAU: Business-as-Usual**, i.e. continuation of current policy measures at Member State and EU level and no further action at EU level with continuation of the current energy label;
- (2) **Energy Label-only**: i.e. revision of the existing Labelling Directive without ecodesign requirements. No stakeholder has expressed support to this option;
- (3) **MEPS⁵-only**: i.e. setting requirements for minimum energy efficiency, noise and information under the Ecodesign Directive. No stakeholder has expressed support for this option;
- (4) **MEPS 2011 + Labelling**: i.e. introduction of minimum energy efficiency requirements in 2011 and 2013 combined with the introduction of a revised energy label. This sub-option would start savings immediately but would leave no time for industry to re-test appliances. This sub-option is favoured in particular by environmental NGOs and some Member States and objected to by industry;
- (5) **MEPS 2012 + Labelling**: i.e. introduction of minimum energy efficiency requirements in 2012 and 2014 combined with the introduction of a revised energy label. This is a compromise in between the sub-options 4 and 6 with no particular opposition or support by stakeholders;

⁴ The Consultation Forum includes affected parties such as Member State representatives, industry, consumer and environmental NGOs.

⁵ The abbreviation 'MEPS' refers to 'minimum energy performance standards', which was used during the preparatory study to refer to minimum energy efficiency requirements.

- (6) **MEPS 2013 + Labelling:** introduction of minimum energy efficiency requirements in 2013 and 2015 combined with the introduction of a revised energy label. This option is favoured by most industry and objected to by environmental NGOs and some Member States.

Step 4: Environmental, economic and social impact assessment

The analysis of sub-options leads to savings as show in the below table.

| Table 2. | | | |
|---|--------------------|--------------------|----------|
| Electricity Savings 2020 in TWh vs. BaU: | | | |
| | Use | Savings | |
| | TWh/a | TWh/a | % |
| Baseline | 74 | | |
| Label_only | 72 | -1.9 | -2.6% |
| MEPS_only (2012-2014) | 64 | -9.4 | -14.6% |
| MEPS-11_Label | 61 | -12.9 | -21.3% |
| MEPS-12_Label | 62 | -11.3 | -18.1% |
| MEPS-13_Label | 64 | -9.3 | -14.5% |
| Expenditure Savings 2020 in EUR vs. BaU | | | |
| | Expenditure | Savings | |
| | bln. Euro | bln. Euro | % |
| Baseline | 45 | | |
| Label_only | 45 | -0.20 | -0.5% |
| MEPS_only (2012 - 2014) | 44 | -1.05 | -2.3% |
| MEPS-11_Label | 44 | -0.81 | -1.8% |
| MEPS-12_Label | 44 | -0.68 | -1.5% |
| MEPS-13_Label | 45 | -0.43 | -1.0% |
| Carbon (CO2 eq) Savings 2020 vs. BaU | | | |
| | Emissions | Savings | |
| | Mt CO2 eq/a | Mt CO2 eq/a | % |
| Baseline | 37,0 | | |
| Label_only | 36,3 | -0,7 | -2,0% |
| MEPS_only (2012-2014) | 33,9 | -3,1 | -9,3% |
| MEPS-11_Label | 32,7 | -4,3 | -13,3% |
| MEPS-12_Label | 33,2 | -3,8 | -11,6% |
| MEPS-13_Label | 33,7 | -3,3 | -9,8% |

The analysis shows that the combined MEPS_Label sub-options offer the best savings and the biggest turnover increase for the whole air conditioner sector with strongest reduction in CO2. The differences between the three MEPS_Label sub-options are small. While the MEPS-11_Label sub-option provides highest savings by 2020, its introduction sets a constraint on manufacturers manufacturing some 94% of the existing appliances. The reason is that the industry must re-test all existing and new appliances (except single ducts and double ducts - some 5-7% of total sales) with the new seasonal efficiency measurement method that has not yet been used by the industry or the test laboratories. Missing or insufficient efficiency information on appliances would risk leading to difficulties in CE marking products and in market surveillance. However, manufacturers have participated in the development of the new efficiency measurement method and have been aware of the possible forthcoming requirements since the start up of the preparatory study in 2006. Consequently, the MEPS-12_Label sub-option is considered to offer the optimal solution between fast savings and minimum strain for the industry.

Finally, most air conditioner manufacturers are global companies. SMEs are considered to be only significantly present in the wholesale and especially retail/installation sector (some 55% of all employees involved in the business is expected to be active in SME sized companies, mainly installers but also in OEM companies). The analysis shows that the policy options will have no negative impact on them. On the contrary, they would benefit from a stronger demand for new technologies and a higher turnover.

The comparison of options and sub-options shows that the appropriate policy option for realizing the improvement potential of air conditioners is a Commission Regulation setting ecodesign requirements combined with an Energy Labelling delegated Regulation to guide customers towards the most efficient appliances. This approach ensures that:

- The least energy efficient air conditioners will be removed from the market, increasing competition on energy efficiency instead on price and additional features;
- on-going energy improvements are fostered by setting a transparent legislative framework that will provide the industry with the long-term security needed to invest in innovative technology;
- information on product differentiation provides consumers with an effective and reliable tool to compare energy consumption of products;
- cost-effective potentials to improve the electricity consumption of air conditioners are quickly realized leading to at least 20%⁶ increase in average efficiency;
- by 2020, the annual electricity consumption and CO₂ emissions of air conditioners will be reduced by 11 TWh and almost 4 mtons of CO₂ equivalent compared to a business as usual scenario;
- possibility of a reduction of direct CO₂ emissions due to possibly lower levels of GWP in refrigerants used in the appliances due to the incentive provided for manufacturers (the savings depend on the uptake of low GWP refrigerants and will occur slowly due to the slow replacement of existing stock);
- a clear legal framework providing a level playing field for manufacturers, ensuring fair competition and free circulation of products;
- requirements for air conditioners are harmonized in the EU, leading to a minimization of administrative burdens and costs for the economic operators;
- disproportionate burdens for manufacturers are avoided due to transitional periods which duly take into account redesign cycles and the fact that the efficiency of most appliances must be re-measured when applying the seasonal energy efficiency method;

As laid out in Section 6 of the impact assessment, monitoring of the impacts will mainly be done by market surveillance carried out by Member State authorities ensuring that the requirements are met, whereas the appropriateness of scope, definitions and concepts will be monitored by the ongoing dialogue with stakeholders and Member States.

⁶ The average efficiency of air conditioners is SEER 3.6 in 2010. Introduction of measures will boost efficiency to over SEER 4.3, leading to savings of at least 20% on the short term and higher savings on the long term.