



EUROPEAN COMMISSION

25.05.2012

**Explanatory Memorandum accompanying**

**COMMISSION REGULATION (EU) No .../...**

**implementing Directive 2009/125/EC of the European Parliament and of the Council  
with regard to ecodesign requirements for space heaters and combination heaters**

## EXPLANATORY MEMORANDUM

### 1. CONTEXT OF THE PROPOSAL

#### **Grounds for and objectives of the proposal**

The Ecodesign Framework Directive 2009/125/EC establishes a framework for setting ecodesign requirements for energy-related products. It is a key instrument of EU policy for improving the energy efficiency and other aspects of the environmental performance of products in the internal market. The Directive lists products identified by the Council and the European Parliament as priorities for the Commission for implementation, including heating equipment (Article 16). Heaters are therefore priority product groups considered for implementing measures under the Ecodesign Directive.

Space heaters and combination heaters, hereafter referred to as heaters, are widely used in the European Union to provide heat to water-based central heating systems for space heating purposes. Whereas space heaters are only used for space heating purposes, combination heaters also provide heat to deliver hot drinking and sanitary water. The scope of the proposed Regulation includes heaters with a rated heat output of up to 400 kW. Types of heaters are boilers, cogeneration units and heat pumps. The scope excludes water heaters providing heat to deliver hot water only. Water heaters are covered by a separate proposal.

As many inefficient heaters continue to be placed on the market, despite lower life cycle costs for heaters with higher efficiencies, the proposed Regulation aims to correct this market failure.

A technical, environmental and economic analysis ('preparatory study') has shown that (i) heaters are placed in large quantities on the internal market; (ii) the main environmental impacts in the life cycle of heaters are energy consumption (electricity or gaseous/liquid fuels), the sound power level and, for heaters using fuels, emissions of nitrogen oxides, carbon monoxide, particulate matter and hydrocarbons. These impacts are considered significant; (iii) there is a wide disparity in the environmental impacts of the heaters currently on the market; and (iv) technically cost-effective solutions exist that could lead to significant improvements. Under Article 15 of Directive 2009/125/EC, heaters should therefore be covered by an ecodesign implementing measure.

Directive 2010/30/EU<sup>1</sup> of the European Parliament and of the Council on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products establishes a framework for the Commission to develop Delegated Regulations for the labelling of energy-related products. In this context, the proposed Ecodesign Regulation is accompanied by a proposed Delegated Regulation for the energy labelling of heaters, including packages of heaters, temperature controls, solar devices and/or passive flue heat recovery devices, establishing a harmonised scheme for the indication of energy efficiency and energy consumption by labelling and standard product information for the benefit of consumers. The labelling requirements also provide a dynamic incentive for manufacturers to improve energy efficiency and to accelerate the market take-up of energy-efficient models.

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<sup>1</sup> OJ L 153, 18.6.2010, p. 1.

It is proposed that the ecodesign and the energy labelling requirements be introduced at the same time to facilitate implementation of the two measures and to guarantee the longest possible validity for the energy label.

### **General context**

The total annual energy consumption of heaters was estimated at about 12 089 PJ (289 Mtoe) in the European Union in 2005, corresponding to some 16% of the total gross energy consumption of the EU-27 (equivalent to the annual gross energy consumption of France). This corresponds to CO<sub>2</sub> emissions of 698 Mt per year. If no specific measures are taken, the annual energy consumption is predicted to be 10 688 PJ in 2020. The annual emissions of nitrogen oxides, expressed in terms of their contribution to acidification, were estimated at 821 kt SO<sub>x</sub> equivalent in the European Union in 2005. If no specific measures are taken, it is predicted that the annual emissions will be 783 kt SO<sub>x</sub> equivalent in 2020. The impact assessment shows that use-phase energy consumption and the nitrogen oxides emissions of heaters can be reduced significantly below business as usual in a cost-effective way.

On the other hand, it is too early to set requirements on carbon monoxide, particulate matter and hydrocarbons, as no suitable European measurement methods are available. The Commission has mandated the European standardisation bodies to develop appropriate European measurement methods for the review of this proposal. National rules for emissions of carbon monoxides, particulate matter and hydrocarbons from heaters may be maintained until such ecodesign requirements enter into force.

The main reasons for the persistent sales of low-efficiency heaters are market failures to provide incentives for manufacturers to place high-efficiency heaters on the market (regulatory failure) and to guide end-users away from purchase decisions based on purchase costs rather than on the life cycle cost of the product (asymmetric information and negative externality). Also, persons installing and sometimes buying a heater (for example the building owner) do not bear the operating costs, which are incurred for example by a tenant paying the electricity bill (split incentive). Potential cost-effective improvements for the end-user are therefore often not realised.

Energy efficiency requirements for space heaters and for the space heating function of combination heaters are set on the basis of seasonal space heating efficiency, which considers the energy inputs to satisfy the space heating demand for a designated heating season under defined conditions.

Energy efficiency requirements for the water heating function of combination heaters are set on the basis of load profiles, namely a certain sequence of water draw-offs representing the function of water heating, in accordance with the proposed Regulation introducing ecodesign requirements for water heaters.

Apart from energy efficiency, the preparatory study also identified sound power levels and nitrogen oxides emissions as significant environmental aspects for certain heaters. Accordingly, maximum sound power level requirements are proposed for heat pumps. For heaters using fuels, the proposed Regulation sets maximum nitrogen oxides emission levels.

The objective of the proposed Regulation is to trigger the market transformation needed to realise the improvement potential. Compared to a business-as-usual scenario it is expected that the proposed Regulation together with the proposed Commission Delegated Regulation on energy labelling will lead to annual use-phase energy consumption savings (EU-27) of

about 1 900 PJ (45 Mtoe) by 2020, corresponding to an annual reduction in CO<sub>2</sub> emissions of about 110 Mt, a reduction in annual nitrogen oxides emissions of about 270 kt SO<sub>x</sub> equivalent, and savings in consumer expenditure of €26 billion by 2020. The energy savings are close to the annual gross energy consumption of the Czech Republic and are therefore considered significant. Furthermore, taking into account the lifetime of the product and the replacement of the stock, it is expected that 15 years after the entry into force of the ecodesign and energy labelling measures annual savings of about 3 100 PJ (74 Mtoe) will be achieved.

### **Consistency with other policies and objectives of the Union**

The Ecodesign Framework Directive 2009/125/EC is an important instrument for achieving the objective of 20% energy savings compared with projections for 2020, and its implementation is one of the priorities in the Commission's Communication on Energy 2020 and Energy Efficiency Plan 2011. Furthermore, implementation of Directive 2009/125/EC will contribute to the EU's target of reducing greenhouse gases by at least 20% by 2020, or by 30% if there is an international agreement that commits other developed countries to comparable emissions reductions. The proposed Regulation is a concrete contribution to this process and is in line with the Commission Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy.

The Energy Labelling Framework Directive 2010/30/EU provides the framework for the Commission to adopt delegated acts for the labelling of energy-related products. The proposed Delegated Regulation for the energy labelling of heaters, including packages of heaters, temperature controls, solar devices and/or passive flue heat recovery devices, complements the minimum energy efficiency requirements of the ecodesign implementing measure.

## **2. CONSULTATION OF INTERESTED PARTIES AND IMPACT ASSESSMENT**

### **Consultation of interested parties**

#### *Consultation methods, main sectors targeted and general profile of respondents*

Stakeholders were consulted as part of the preparatory study as well as within the Ecodesign Consultation Forum.

Ecodesign Consultation Forum meetings on heaters and water heaters were held on 29 February 2008, 8 July 2008, 24/25 June 2009 and 23 June 2010. Building on the results of the preparatory study, Commission staff presented working documents suggesting ecodesign requirements and an energy labelling scheme for heaters and water heaters<sup>2</sup>. The documents were sent to the members of the Consultation Forum, and to the secretariats of the ENVI (Environment, Public Health and Food Safety) and ITRE (Industry, Research and Energy) Committees of the European Parliament for information. The working documents were published on DG ENER's ecodesign website and placed on the Commission's CIRCA portal alongside the stakeholder comments received in writing before and after the meeting. The working documents were also discussed at a meeting of the Ecodesign Regulatory Committee on 11 April 2011.

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<sup>2</sup> Water heaters are covered by a separate proposal.

During the meeting of the Ecodesign Consultation Forum of 24 June 2009 it was agreed that an ad hoc technical working group should finalise the transitional testing and calculation methods to be used until harmonised standards are available. This working group, consisting of experts of the affected industry sectors, consumer organisations and environmental NGOs and Commission staff, met in December 2009 and February 2010. The relevant documentation, including the contributions of the experts, is available on the CIRCA system.

An additional written consultation of the Ecodesign Consultation Forum and at expert level was launched in March 2011 on updated working documents for ecodesign and energy labelling measures for heaters and water heaters, which build on the input/feedback provided during the earlier consultations of the Consultation Forum.

### Summary of responses and how they have been taken into account

In general an ecodesign measure for heaters is well supported by stakeholders and Member States. The responses of the main stakeholders on crucial features of the working documents and how they have been taken into account can be summarised as follows:

#### *Product scope*

Most Member States and stakeholders agree that the products to be covered are boilers and heat pumps, as both space heaters and combination heaters, with a rated heat output up to 400 kW and cogeneration with an electrical capacity up to 50 kW. The heaters should be able to use gas or oil fuel, including from biomass (unless predominantly), electricity or ambient/waste heat.

Member States and stakeholders suggested discarding the previously proposed lower limit of 4 kW, due to the market introduction of heat pumps, and referring to the rated heat output instead of the rated input.

Regarding biomass there were different views: some Member States and stakeholders called for requirements to be set for all heaters using gaseous and liquid biomass fuels, whereas others were against this. There are no data available to set energy efficiency and NO<sub>x</sub> requirements for heaters designed specifically for gaseous and liquid biomass. However, there is the risk that fossil fuel heaters capable of using gaseous and liquid biomass to some extent are unintentionally exempted from the measure, so it is proposed that only heaters specifically designed for using predominantly biomass fuels be exempted.

A Member State questioned the way the scope was defined for cogeneration based on electrical capacity. However, other stakeholders agreed as this is the definition of micro-cogeneration, as set out in Directive 2004/8/EC.

Some Member States and stakeholders questioned the exemption for equipment distributing heat from district heating. As the preparatory study confirms that this equipment is not equipped with a heat generator, the exemption is removed.

Some stakeholders raised the concern that sometimes heat generators and heater housings are placed separately on the market and in that case would be exempted from the measure. Such heat generators and heater housings are therefore considered a heater and the notion 'putting into service' is introduced, whereas heat generators and heater housings placed on the market as spare parts for existing heaters are exempted until 1 January 2018.

Based on the comments received from several Member States and stakeholders the terminology is further clarified with regard to heaters, space heaters, combination heaters and supplementary heaters.

Several Member States and stakeholders were confused by the term ‘boiler’, covering conventional boilers and new and renewable heating technologies such as cogeneration and heat pumps. The term ‘boiler’ was therefore replaced by ‘heater’. Moreover, it was not clear which ecodesign requirements apply to space heaters, combination heaters or both. The proposed Regulation therefore sets ecodesign requirements for space heaters (boilers, cogeneration units, heat pumps) and combination heaters (boilers, heat pumps).

Some stakeholders remarked that a ‘supplementary heater’ was named ‘back-up heater’ for certain technologies. It is clarified that a supplementary heater is a non-preferential heater that generates heat in cases where the heat demand is greater than the rated heat output of the preferential heater, whereas a back-up heater generates heat only when the external heat source is disrupted, including during maintenance periods, or out of order.

### *Definitions*

A Member State and manufacturers asked for the heat pump definitions to be adjusted to include heat pumps using fuels. The proposed Regulation addresses heat pumps using electricity and fuels.

### *Ecodesign requirements for energy efficiency*

Several Member States and boiler manufacturers raised the issue that there are almost 5 million dwellings in the European Union with shared open-flue systems. For technical and economic reasons it is not possible to replace existing non-condensing boilers by efficient condensing boilers in dwellings where such a shared open-flue system exists. The requirements should therefore allow non-condensing boilers specifically designed for such a configuration, so-called B11 boilers, to remain on the market. Combination boilers used in dwellings connected to shared flue systems require a rated heat output up to 30 kW due to the water heating function, whereas space heaters used in dwellings connected to shared flue systems require a rated heat output up to 10 kW. At the same time, some Member States and stakeholders pointed out that the requirement that all boilers  $\leq 15$  kW be limited to the non-condensing technology is superfluous due to the B11 exemption. Consequently, ecodesign requirements are proposed for B11 boiler combination heaters  $\leq 30$  kW and B11 boiler space heaters  $\leq 10$  kW at 75% (non-condensing technology) and other boilers  $\leq 70$  kW at 86% (condensing technology).

One Member State welcomed the level of ambition suggested for boilers above 70 kW, close to the physically possible limit, whereas other Member States and manufacturers objected. A lower ecodesign requirement is proposed (at 86% for the useful efficiency at 100% of the rated heat output, and at 94% for the useful efficiency at 30% of the rated heat output).

Some Member States requested that minimum requirements be set for electric heaters providing heat to a water-based central heating system. To avoid the market share of  $< 5\%$  of these heaters increasing, ecodesign requirements are proposed (30% two years after entry into force, 36% four years after entry into force).

Some Member States remarked that the draft proposal lacked ambition for heat pumps. Tougher ecodesign requirements removing the worst heat pumps from the market are suggested (100% two years after entry into force, 110% four years after entry into force).

Member States and stakeholders accepted separate minimum efficiency requirements for low-temperature heat pumps (115% two years after entry into force, 125% four years after entry into force).

Regarding greenhouse gas emissions attributable to refrigerants, several Member States called for the bonus for low GWP refrigerants to be removed from the energy efficiency requirements due to the non-significant contribution (in average 7%) of refrigerants to the environmental impact of heating equipment. The bonus is therefore removed but the significance of refrigerants used in heat pumps should be re-assessed in the review of the legislation.

Stakeholders requested that the minimum requirements for the water heating energy efficiency of combination heaters should be the same as the water heating energy efficiency suggested for water heaters in the proposed Ecodesign Regulation on water heaters.

#### *Ecodesign requirements for sound power levels*

One Member State and stakeholders pointed out that the proposed sound power levels for heat pumps would remove most heat pumps  $\geq 12$  kW from the market. Revised ecodesign requirements for heat pumps  $\leq 70$  kW are proposed.

#### *Ecodesign requirements for nitrogen oxides emissions*

The proposed NO<sub>x</sub> limits for heaters with external combustion using gas were accepted. Some Member States and manufacturers stressed that the limit of 120 mg/kWh for boilers using fuels cannot be lowered, although one Member State would have preferred a limit of 105 mg/kWh. Several Member States and stakeholders pointed out that the proposed NO<sub>x</sub> limits were not appropriate for cogeneration units and heat pumps using internal combustion engines. Higher NO<sub>x</sub> limits are proposed to avoid the risk of stopping innovation in the field of cogeneration and heat pumps.

#### *Product information*

Several stakeholders remarked that the product information requirements should not duplicate the standard product information requirements of the proposed Delegated Regulation for the energy labelling of heaters. The ecodesign product information is therefore limited to information for market surveillance purposes.

#### *Timetable*

Manufacturers requested that the energy labelling timelines be aligned with the ecodesign timelines for ensuring compliance of heaters and implementing the energy labelling scheme with suppliers and dealers. At the same time, several Member States and stakeholders questioned the level of ambition of the first stage of the ecodesign requirements. Instead of the two-stage approach to introducing condensing technology in gas/oil fired boilers, it is therefore proposed that condensing technology be introduced in one stage applicable two years after entry into force of the Regulation.

On the other hand, Member States requested only in the stakeholder consultation in May 2011 that minimum requirements should be introduced for electric boilers and heat pumps to remove the most inefficient appliances from the market. These minimum requirements should be introduced four years after entry into force of the Regulation, with a transitional step after two years, to give manufacturers sufficient time to comply. In addition, water heating energy efficiency requirements are introduced for combination heaters four years after entry into force of the Regulation, with a transitional step after two years, in line with the two-stage approach taken in the proposed Ecodesign Regulation on water heaters.

Some Member States and environmental NGOs requested that the NO<sub>x</sub> requirements be introduced three years after entry into force of the Regulation, instead of five years. The timetable is therefore adapted for boilers. However, for new technologies such as cogeneration and heat pumps the timing of five years is considered appropriate.

#### *Measurement and calculation*

Views differed on the conversion coefficient of 2,5 to be used for the purposes of harmonised calculations of seasonal space heating energy efficiency and water heating energy efficiency at EU level. Some Member States and stakeholders would have preferred a lower conversion coefficient of 2,2 due to the increased use of renewables in the electricity grid; others argued that the conversion coefficient should rather be 2,8 as the calculations are based on the Gross Calorific Value. Commission staff stressed that a conversion coefficient of 2,5 is referred to in Directive 2006/32/EC on energy end-use efficiency and energy services, reflecting the estimated 40% average EU generation efficiency. There is no evidence yet that the value has changed. The proposal for an Energy Efficiency Directive COM(2011) 370 and the proposed Ecodesign Regulations therefore also refer to a conversion coefficient of 2,5. The review of the proposed Ecodesign Regulation should assess the validity of the value.

Several Member States and stakeholders requested that the turndown ratio penalty for non-modulating boilers be removed from the calculation of the seasonal space heating energy efficiency, as modulation is already considered in the efficiency testing at 30% part load, and evidence was provided that modern heaters can achieve high efficiencies at low heating loads without modulation.

Several Member States and stakeholders requested the Commission to reconsider the penalty percentage for temperature controls integrated in heaters, as compatibility with an open communication protocol would not change the energy efficiency of the device as such. The 0,5 % advantage for a product which is supplied with an open communication protocol is therefore removed from the transitional measurement and calculation method.

A stakeholder pointed out that the energy consumption of groundwater pump(s) used for water-/brine-to-water heat pumps should be included in the energy efficiency calculation to create a level playing field between air-to-water and water-/brine-to-water heat pumps. A penalty of 5% is therefore introduced in the transitional measurement and calculation method.

#### *Third-party verification*

Industry suggested using third-party verification instead of self-assessment as a tool to support market surveillance, given the risk of not achieving the high environmental improvement potential of heaters and since third-party verification is established under the Boiler Directive 92/42/EEC.



However, these reasons do not duly justify third-party verification and are not proportionate to the risk, as required under Article 8(2) of the Ecodesign Directive. Moreover, third-party verification under Ecodesign alone does not make sense, considering that third-party verification is legally not possible under the Energy Labelling Directive under which third-party verification was considered as most useful.

To support the industry and Member State authorities in market surveillance, the Commission has launched an annual market surveillance monitoring action in January 2012 and will continue reinforcing the administrative cooperation between, and with, the Member State market surveillance authorities through the Ecodesign and Energy Labelling ADCO groups. Furthermore, specific studies on the efficiency of market surveillance (focusing in particular on priority products, such as heaters, motors and lighting) will be launched in 2012 in the context of the preparation of the reviews of the Ecodesign and Energy Labelling Directives in 2014.

#### *Measurement tolerances*

Stakeholders remarked that the proposed tolerance of 10% for NO<sub>x</sub> measurement is not realistic; a much higher value of 30-40% would be more appropriate. Based on tests for products emitting 70 mg/kWh a tolerance of 20% is proposed.

#### *International stakeholders*

The proposed measure was notified to the WTO/TBT on [date after ISC] to ensure that no barrier to trade was introduced.

### **Collection and use of expertise**

#### *Scientific/expertise domains concerned*

External expertise was mainly gathered through the preparatory study providing a technical, environmental and economic analysis, which was carried out by a consortium of external consultants on behalf of the Commission's Directorate-General for Energy. Additionally, a scenario analysis of various policy options was developed for the impact assessment by an external consultant.

#### *Methodology used*

The methodology followed the provisions of the Directive, in particular Article 15 and Annexes I and II. The technical, environmental and economic analysis followed the structure of the 'Methodology Study Ecodesign of Energy-using Products' devised for the Commission's Directorate-General for Enterprise and Industry and endorsed by stakeholders.

#### *Main organisations/experts consulted*

The preparatory study was conducted in an open process, taking into account input from stakeholders, including manufacturers, installers, retailers and their associations, environmental NGOs, consumer organisations, EU/EEA Member State experts and experts from third countries.

#### *Summary of advice received and used*

The technical, market and economic analysis carried out for the preparatory study resulted in recommendations for ecodesign requirements for heaters. These recommendations were used, in conjunction with the most recent available data from the industry, for suggesting possible ecodesign requirements for heaters to the Consultation Forum. The comments of members of the Consultation Forum were addressed during the impact assessment, which involved continuous collaboration with various individual stakeholders and experts.

No potentially serious risks with irreversible consequences were mentioned by any stakeholder, nor were any identified during the preparatory work.

#### Means used to make the expert advice publicly available

The preparatory study was accompanied by a dedicated website where interim results and further relevant materials were published regularly for timely stakeholder consultation and input. Written inputs from stakeholders are listed in the final report of the preparatory study. The study website was publicised on DG ENER and DG ENTR specific ecodesign websites. Open consultation meetings for directly affected stakeholders were held on the premises of the contractor to discuss the preliminary results of the study.

The written input received during the Consultation Forum process is available on the Commission's CIRCA portal. The minutes of the Forum meetings on heaters are available on the DG ENER website.

#### **Impact assessment**

An impact assessment of the possible policy measures was carried out, taking into account the criteria set out in Article 15(5) of the Ecodesign Directive, and the impacts on manufacturers, including SMEs.

Several policy options for achieving a market transformation fulfilling the appropriate level of ambition are considered, including the business as usual case, self-regulation, energy labelling only, an ecodesign regulation only, a combination of the latter two, and requirements for heating systems set under the Energy Performance of Buildings Directive only.

However, due to the clear mandate given by the legislator for establishing ecodesign requirements and energy labelling for heaters, the depth of the analysis of other options is proportionate for a legal implementing act, and the focus is on assessing the proposed implementing regulations.

The impacts of several policy scenarios involving the establishment of ecodesign requirements as an important feature have therefore been assessed against the 'business as usual' scenario (scenario 1):

- Scenario 2: Ecodesign minimum requirements  
This scenario means that ecodesign requirements would be set in an implementing measure pursuant to the Ecodesign Directive, without establishing an energy labelling scheme for heaters pursuant to the Energy Labelling Directive.
- Scenario 3: Minimum requirements, labelling and energy performance of buildings  
This scenario means that ecodesign requirements for heaters would be set in an implementing measure pursuant to the Ecodesign Directive, in combination with an energy labelling scheme for this product group established by an implementing measure pursuant

to the Energy Labelling Directive, and minimum performance requirements for technical building systems set in the EPBD.

- Scenario 4: Minimum requirements, labelling and energy performance of buildings/ reduced standards for the smallest heaters

This scenario means that ecodesign requirements for heaters would be set in an implementing measure pursuant to the Ecodesign Directive, in combination with an energy labelling scheme for this product group established by an implementing measure pursuant to the Energy Labelling Directive, and minimum performance requirements for technical building systems set in the EPBD. Compared to scenario 3, the minimum efficiency requirements for the smallest heaters are less ambitious.

- Scenario 5: Minimum requirements, labelling, energy performance of buildings and NO<sub>x</sub> requirements

Like scenario 4, this scenario means that ecodesign requirements for heaters would be set in an implementing measure pursuant to the Ecodesign Directive, in combination with an energy labelling scheme for this product group established by an implementing measure pursuant to the Energy Labelling Directive, and minimum performance requirements for technical building systems set in the EPBD. In addition, limits for NO<sub>x</sub> emissions are set as ecodesign requirements for heaters. Three sub-scenarios 5a, 5b and 5c reflect different levels of ambition of such ecodesign requirements.

Sub-options for the timing of ecodesign requirements for the energy efficiency of heaters have been taken into account, but due to a delay in the consultation procedure, alternatives in timing have become irrelevant. As a result only single-stage and two-stage implementation of the main minimum requirement to introduce condensing technology was taken into account for the various policy options. Single-stage implementation entails ecodesign requirements for heaters becoming effective two years after entry into force of the Regulation. These ecodesign requirements correspond to a 20-30% improvement on today's average energy efficiency of heaters.

Based on the assessment of costs and benefits, a combination of scenarios 4 and 5b (minimum requirements, labelling, energy performance of buildings, reduced standards for the smallest heaters and NO<sub>x</sub> requirements) is the preferred option to solve the problem of market failure for the take-up of heaters with improved environmental performance, as it optimally fulfils the requirements of the Ecodesign and Energy Labelling Directives. The reduced requirements for the smallest heaters reflect the above-mentioned discussion on B11 boilers used in open share flue systems in collective buildings. The main ecodesign requirement to introduce condensing technology for the energy efficiency of heaters should be laid down in one stage becoming effective two years after entry into force of the proposed Regulation. Additionally, Member States argued in the stakeholder consultation of May 2011 in favour of introducing minimum requirements for electric boilers and heat pumps, having together a current market share of < 10%. These requirements are introduced two and four years after entry into force, so that the market introduction of heat pumps is not hindered and electric boilers are allowed to remain on the market for certain niches, e.g. second homes, while the sale of low-quality products is prevented.

This combination of ecodesign requirements and energy labelling has the following results:

- the ecodesign requirements achieve potential for cost-effective improvements in the energy efficiency of heaters;

- the labelling scheme creates market transparency for consumers and provides incentives for manufacturers to innovate/invest in energy efficiency;
- the life-cycle environmental impact of heaters related to the use-phase energy consumption and NO<sub>x</sub> emissions (see section 1) is significantly reduced;
- the consumer will have to pay more for the heater and its installation but will save significantly in energy costs, resulting in a pay-back time of less than four years, whereas the lifetime of a heater is estimated to be 15-17 years. Overall, the savings in consumer expenditure are expected to be € 26 billion by 2020;
- a clear legal framework is created which ensures fair competition;
- there will be positive impacts on the competitiveness of industry, including SMEs;
- there will be a positive impact on employment in the EU;
- requirements for the placing on the market of heaters relating to for energy efficiency and NO<sub>x</sub> emissions in the EU are harmonised, leading to the lowest possible administrative burdens and costs for economic operators;
- no disproportionate burdens and only small additional costs for manufacturers are created due to transitional periods which duly take into account re-design cycles, the pace of innovation and return on the associated investments.

### **3. LEGAL ELEMENTS OF THE PROPOSAL**

#### **Summary of the proposed action**

##### **1. Definition of the scope of the proposed Regulation**

The scope of the proposed Ecodesign Regulation covers boilers and heat pumps, as both space heaters and combination heaters, with a rated heat output up to 400 kW and cogeneration with an electrical capacity up to 50 kW, as defined in Directive 2004/8/EC. The heaters covered use gas or oil fuel, including from biomass (unless predominantly), electricity and ambient/waste heat. Heaters using solid or predominantly biomass fuels are not covered by the proposed Regulation.

##### **2. Phased implementation of ecodesign requirements**

It is proposed that requirements on minimum seasonal space heating energy efficiency, minimum water heating energy efficiency, maximum sound power level, maximum nitrogen oxides emissions and information to be provided by manufacturers will enter into force as follows:

###### **1) From two years after entry into force:**

- Space heaters and combination heaters must comply with the requirements for minimum seasonal space heating energy efficiency/useful energy efficiency, maximum sound power level for heat pump heaters and provision of information indicated in Annex II, points 1(a), 3 and 5.

- Combination heaters must in addition comply with the requirements for minimum water heating energy efficiency indicated in Annex II, point 2(a).
- 2) From three years after entry into force:
- Boiler heaters must comply with the requirements for maximum nitrogen oxides emission levels indicated in Annex II, point 4(a).
- 3) From four years after entry into force:
- Electric heaters, cogeneration units and heat pump heaters must comply with the requirements for minimum seasonal space heating energy efficiency/useful energy efficiency indicated in Annex II, point 1(b).
  - Combination heaters must comply with the requirements for minimum water heating energy efficiency indicated in Annex II, point 2(b).
- 4) From five years after entry into force:
- Cogeneration and heat pump heaters must comply with the maximum nitrogen oxides emission levels indicated in Annex II, point 4(b).

These requirements are aimed at realising the potential for reducing the use-phase energy consumption, nitrogen oxides emissions and sound power level, while fulfilling the criteria for ecodesign implementing measures set out in the Ecodesign Directive.

This push strategy meets the stakeholder requests for ambitious requirements and corresponds to the levels of ambition proposed by the preparatory study and supported by the Member States and stakeholders in the Consultation Forum and Regulatory Committee meetings on 29 February 2008, 24/25 June 2009 and 11 April 2011 and the written consultation in May 2011.

The main ecodesign requirement is the setting of minimum seasonal space heating energy efficiency at the level of condensing boilers (86%) in the first stage after two years, with the exception of B11 boilers used in dwellings connected to shared flue systems ( $\leq 10$  kW for space heaters,  $\leq 30$  kW for combination heaters also having a water heating function). This date takes into account the time manufacturers need to test existing heater models, adapt product capacities and provide the new energy label and standard product information introduced simultaneously in the proposed Delegated Regulation on energy labelling of heaters and packages comprising a heater, temperature control, solar device and passive flue heat recovery device.

Additionally, Member States and stakeholders called for requirements to be set for electric boiler heaters, cogeneration units and heat pump heaters, to remove the most inefficient heaters from the market without placing a burden on manufacturers, and for the same requirements to be set for the water heating energy efficiency of combination heaters as for the water heating energy efficiency of water heaters in the separately proposed Ecodesign Regulation on water heaters. These requirements will be introduced in a first stage two years after entry into force and a second stage after four years.

Manufacturers are encouraged to place more efficient and more silent heaters on the market. This pull strategy will be encouraged through the new energy label providing consumers with comparative information on the efficiency of heaters.

In order to allow heater manufacturers to adapt products and/or production lines for the maximum nitrogen oxides emission levels, the requirements are introduced three years after entry into force for boiler heaters and five years after entry into force for cogeneration units and heat pump heaters, which reflects the state of development of emission reduction technologies for the different types of heaters.

### 3. Measurements and calculations

Measurements and calculations of the relevant product parameters should be performed using generally recognised state-of-the-art calculation and measurement methods. In this context, manufacturers may apply reliable, accurate and reproducible measurement and calculation methods and harmonised standards established in accordance with Article 10 of Directive 2009/125/EC, as soon as they are made available and published for that purpose in the *Official Journal of the European Union*. Requirements for calculation and measurement methods are specified in Annex III.

For the purposes of calculating the seasonal space heating energy efficiency and water heating energy efficiency, electricity consumption is to be multiplied by a conversion coefficient of 2,5. The coefficient reflects the estimated 40% average EU generation efficiency, as referred to in Directive 2006/32/EC on energy end-use efficiency and energy services.

### 4. Conformity assessment procedures

As required in Article 8(2) of Directive 2009/125/EC the proposed Regulation specifies the applicable conformity assessment procedures, which should be either internal design control as set out in Annex IV to that Directive or the management system set out in Annex V to the Directive.

### 5. Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the Member States' authorities must apply the following verification procedure for the requirements set out in Annex II:

- a) The authorities of the Member State must test a single unit and provide the information about test results to the authorities of the other Member States.
- b) The model is considered to comply with the provisions set out in the proposed Regulation if the value declared by the manufacturer meets the requirements set out in Annex II and if the measured values meet the value declared by the manufacturer within the tolerances specified in Annex VI. These tolerances are 8% for energy efficiency parameters, 2 dB for sound power level and 20% for nitrogen oxides emissions.
- c) If the result referred to in point b) is not achieved, the market surveillance authority must randomly select three additional units for testing and provide the information about test results to the authorities of the other Member States and to the Commission within one month of the testing.
- d) The model is considered to comply with the provisions set out in the proposed Regulation if the value declared by the manufacturer meets the requirements set out in Annex II and if the average of the measured values for the three

additional units meets the value declared by the manufacturer within the above-mentioned tolerances.

- e) If the results referred to in point d) are not achieved, the model is to be considered not to comply with the proposed Regulation.

## 6. Information requirements

In order to facilitate compliance checks, manufacturers are required to provide information in the technical documentation referred to in the conformity assessment procedures. Further standard product information to the end-user is set out in the separately proposed Delegated Regulation on energy labelling.

## 7. Benchmarks

Based on the currently available technologies, benchmarks for high energy efficiency, low sound power levels and low nitrogen oxides emissions are provided for best performing products.

## 8. Date for evaluation and possible revision

The main issues for a possible revision of the proposed Regulation are:

- the appropriateness of setting ecodesign requirements for greenhouse gas emissions related to refrigerants;
- on the basis of the measurement methods under development, the level of the ecodesign requirements for emissions of carbon monoxide, hydrocarbons and particulate matter that may be introduced;
- the appropriateness of setting stricter ecodesign requirements for energy efficiency of boilers, the sound power level and nitrogen oxides emissions;
- the appropriateness of setting ecodesign requirements for heaters specifically designed for using predominantly biomass fuels;
- the validity of the conversion coefficient value for electricity.

Taking into account the time necessary to collect, analyse and complement the data in order to properly assess technological progress with space and combination heaters, a review can be presented to the Consultation Forum five years after entry into force of the proposed Regulation.

## 9. Transitional provisions

For the energy efficiency requirements the proposed Regulation allows, during the first two years after its entry into force, the placing on the market and/or putting into service of heaters which are in conformity with the national provisions on energy efficiency in force when the proposed Regulation is adopted.

For the nitrogen oxides emissions requirements the proposed Regulation allows, during the first three years after its entry into force, the placing on the market and/or putting into service

of boilers which are in conformity with the national provisions on nitrogen oxides emissions in force when the proposed Regulation is adopted. The same transitional provision applies for heat pumps and cogeneration units during the first five years after entry into force of the proposed Regulation.

National provisions for emissions of carbon monoxides, particulate matter and hydrocarbons from space heaters and combination heaters may be maintained until corresponding ecodesign requirements enter into force.

#### 10. Repeal

Council Directive 92/42/EEC is repealed without prejudice to the obligations of the Member States relating to the transposition into national law and application of this Directive until the ecodesign requirements set out in Annex II of this Regulation start to apply.

#### **Legal basis**

The proposed Regulation is an implementing measure pursuant to Directive 2009/125/EC, in particular Article 15(1) thereof. The Directive is based on Article 114 of the Treaty.

#### **Subsidiarity principle**

The adoption of ecodesign measure for heaters by individual Member States' legislation would lead to obstacles to the free movement of goods within the EU. Such measures must therefore have the same content throughout the EU. In line with the principle of subsidiarity, it is thus appropriate for the measure in question to be adopted at EU level.

#### **Proportionality principle**

In accordance with the principle of proportionality, this measure does not go beyond what is necessary in order to achieve the objective. It offers requirements which act as an incentive for technology leaders to invest in high-efficiency heater technology. It also leads to higher savings than any other conceivable option with minimum administrative costs.

#### **Choice of instrument**

Proposed instrument: Regulation.

Other means would not be appropriate for the following reason(s):

The proposed form of action is a Commission Regulation implementing Directive 2009/125/EC, because the objectives of the action can be achieved most efficiently by fully harmonised requirements throughout the EU (including the date of entry into force), thus ensuring the free movement of complying heaters. No costs arise for national administrations for transposition into national legislation.

#### **4. BUDGETARY IMPLICATION**

The proposal has no implications for the EU budget.



## **5. ADDITIONAL INFORMATION**

### **Review/revision/sunset clause**

The proposal includes a review clause.

### **European Economic Area**

The proposed act concerns an EEA matter and should therefore extend to the European Economic Area.