

## Working documents on ecodesign and energy labelling for boilers of March 2011

### - Notes -

Working documents on ecodesign and energy labelling of boilers were sent on 31 March to the "Ecodesign Consultation Forum" and Experts for views. They build on the results of earlier consultations, including the meeting of the Ecodesign Consultation Forum in June 2009. Elements related to sanitary water heating by combination boilers are to be complemented in accordance with corresponding elements of the measures on ecodesign and energy labelling for water heaters.

In the following, explanations on several issues are given, and suggested changes to the working documents released for the meeting of the Consultation Forum in June 2009 are highlighted.

### Ecodesign

#### 1. Scope

The scope of ecodesign is suggested to cover "self-standing" boilers, without taking into consideration their combinations with other parts such as controls. The technologies covered are fossil-fuel boilers, heat pumps and micro cogeneration up to electrical capacity of 50 kW, including combination boilers providing heat for heating sanitary water.

#### 2. Ecodesign requirements for energy efficiency

Ecodesign requirements are suggested to be set, product-specifically, for seasonal space heating energy efficiency. The second stage requirements correspond to "condensing" technology of fossil-fuel boilers above 15 kW power input, and to "low-temperature" technology below 15 kW power input. An additional product category "low-temperature heat pumps" is suggested, with higher efficiency levels.

Compared to the working documents discussed during the meeting of the Ecodesign Consultation Forum in June 2009 the following modifications are suggested:

- Energy efficiency levels are increased by 11 percentage points, because this value corresponds to distribution, fluctuation and stratification losses considered in the 2009 documents, but which are not considered in the current documents (see remarks on "testing and calculation method" below).
- The power input threshold is raised to avoid negative impacts on consumers where installation of condensing technology is not possible without changes to the building.
- The requirements address "self-standing" products, but not combinations of boilers with other parts (no "bundling").
- A separate product category "low-temperature heat pump" is suggested, because such heat pumps cannot always deliver heat for medium temperature (55°C) heat emitter applications, which is the basis for the efficiency assessment for all other boilers. Ecodesign requirements for such heat pumps are increased by 25 percentage points with

respect to the requirements for all other boilers, corresponding to the efficiency increase obtained when operating heat pumps at low-temperature application.

- In accordance with the concepts developed for ecodesign and energy labelling of air conditioners, a 15 percentage point bonus is foreseen for the use of refrigerants with a global warming potential below 150.
- "Installation requirements" are not foreseen, but will instead be set by Member States under Article 8 of the recast EPBD on the overall energy performance of technical building systems, including heating systems.

### 3. Ecodesign requirements for NOx emissions

The suggested ecodesign requirements on NOx emissions are 120 mg/kWh (200 mg/kWh for micro cogeneration), taking into account stakeholder input.

### 4. Ecodesign requirements for noise

Ecodesign requirements are suggested consistent with the implementing measure for air-conditioners.

### 5. Conformity assessment

It is suggested to foresee self-certification, because, taking into account the provisions of Article 8(2) of the Ecodesign Directive, no risks have been identified so far that would justify a conformity assessment procedure different from those set out in Annex IV and V of that Directive.

## **Energy labelling**

Energy labelling requirements are suggested for (i) boilers and (ii) their combinations with certain additional parts: controls, solar panels, storage tanks and passive flue heat recovery devices. Main elements are the "product" labels and the fiche for boilers with heat input up to 70 kW. The fiche includes a sheet for each individual boiler intended for offers of boilers combined with these additional parts and/or with a second boiler ("installer label"). For combination boilers, space heating and sanitary water heating are addressed by separate product and installer labels.

### 1. Product label

Product labels are suggested for fossil fuel boilers, heat pumps and micro cogeneration boilers. Main elements include the following:

- The label layout differs according to boiler type, that is, there are specific layouts for fossil fuel boilers (climate independent), heat pumps (climate dependent) and micro cogeneration (electrical efficiency).
- The label format is suggested to be "phased in" in two steps:
  - The format of the first step includes energy efficiency classes A+ to G, where class A corresponds to the performance of best technology without input of renewable

energy sources (RES), and A+ requires the input of RES. This choice is suggested on the following grounds:

- "devaluation" of the current financially most accessible energy efficient technologies should be avoided to foster quick market transformation;
  - it should be signalled that the efficiency level of best performing technology not using RES can be further enhanced to foster the uptake of heating using RES input.
- The label format is upgraded to A++ to E in a second step.
- The energy efficiency ranking scale is based on seasonal space heating energy efficiency, where for electric heat pumps the seasonal coefficient of performance (SCOP) is corrected by a factor of 2.5, reflecting the average efficiency of providing electricity from primary energy sources.
  - The label format for boilers using fossil fuels includes an indication of seasonal space heating energy efficiency, expressed as a percentage with respect to the gross calorific value of the fuel
  - The label format for heat pumps includes an indication of the seasonal space heating energy efficiency in primary energy terms, and the seasonal coefficient of performance (SCOP).
  - The ranking scale corresponds to the suggestions presented in June 2009, upgraded by 11 percentage points (see distribution, fluctuation and stratification losses above).
  - The ranking scale for low-temperature heat pumps is further upgraded by 25 percentage points (see "low-temperature heat pumps" above).

## 2. "Installer label"

It is suggested that suppliers of boilers provide a sheet that enables dealers to assess the seasonal space heating energy efficiency (and water heating energy efficiency of fossil fuel combination boilers) of combinations of boilers with other parts and/or a second boiler, as offered to the end-user. The sheet could also be used by suppliers to assess the energy efficiency of such combinations, e.g. for the purpose of advertisements.

The installer label was developed on the following grounds/rationale:

- The installer label should be easy to apply for dealers, while avoiding over-simplification in assessing energy efficiency.
- The coefficients for assessing the seasonal space heating energy efficiency of combinations of boilers with other parts and/or a second boiler suggested in the "installer label" are derived from results of the technical subgroup on "testing and calculation methods", that has developed a mathematical model for assessing the seasonal space heating energy efficiency of combinations of heat generators and/or further parts (available on the Circa system).
- The sheet of a specific boiler model as delivered by the supplier contains the data pertaining to that boiler, indicated by roman numerals in the sheets of the Annex specifying the fiches.

- Entries related to solar collectors, temperature controls and storage tanks will be provided by the supplier of these parts in the corresponding fiches.
- The fiche is to be completed by the dealer, as relevant for the combination offered, and is part of the offer to the end-user.

### **Testing and calculation methods**

Testing and calculation methods are based on the following considerations.

- Testing and calculation methods follow, where available and appropriate, testing and calculation methods used in standards or preliminary standards. The references and, where needed, additional elements for testing and calculations will be specified in a "transitional" Commission communication<sup>1</sup>, intended to be replaced by harmonised standards.
- Calculations for combinations of boilers with further parts and/or a second boiler are foreseen in the "installer label", which is based on the results of the technical testing and calculation expert group. No further "model" for evaluating the energy efficiency of boilers with other parts and/or a second boiler is foreseen, with a view to avoiding discrepancies of energy efficiency assessments of identical "system" configurations due to different calculation methods, and to reducing administrative burdens for suppliers.
- In the assessment of the seasonal space heating energy efficiency of fossil-fuel boilers a weighted average of part load conditions at 30% and 100% of the nominal energy input is used, with corrections to account for effects that are not covered by steady-state boiler tests, such as auxiliary electricity consumption and the effects of temperature controls (3 percentage point reduction of weighted average of part load conditions, that can be "recovered" adding certain types of controls, cf. "installer label"). In addition, for cogeneration units the electrical efficiency is taken into account.
- In the assessment of the seasonal space heating energy efficiency of heat pumps the SCOP as established by prEN 14825 is used, with corrections to account for effects such as the efficiency of electricity provision (electric heat pumps only) and effects of temperature controls (as for fossil fuel boilers).

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<sup>1</sup> see e.g. Commission communication (2010/C 16/09) related to household refrigeration appliances, OJ C 16, 22.1.2010, p. 19.