CONSUMER RELEVANT ECO-DESIGN REQUIREMENTS FOR BOILERS AND WATER HEATERS

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Summary

In the context of the implementation of the Eco-design of Energy-using Products (EuP) Directive, the European Commission is proposing eco-design requirements for boilers and water heaters (Lots 1 and 2). These requirements are largely based on the findings of the relevant preparatory studies on boilers and water heaters.

This paper outlines the main consumer relevant issues related to the possible eco-design requirements for boilers and water heaters and recommends improvement options. We give specific, technical recommendations to increase the energy efficiency of these products and highlight the need for a well-designed labelling scheme to inform consumers.

Introduction

This paper outlines the main consumer relevant issues related to the possible eco-design requirements for boilers (Lot 1)[1] and water heaters (Lot 2)[2] and recommends improvement options. We give specific, technical recommendations to increase the energy efficiency of these products and highlight the need for a well-designed labelling scheme to inform consumers.

1. General remarks

Consumer organisations welcome and support the Commission proposal to introduce eco-design requirements for boilers and water heaters. Central Heating Boilers (CH-Boilers) as well as water heaters constitute one of the most relevant product groups covered by the EuP process due to their savings potential. Moreover, many other countries, such as New Zealand and Australia, have minimum efficiency standards at very stringent levels already in place. Dumping of inefficient water heaters from these countries to European consumers has to be avoided.

Consumers will benefit from energy efficient boilers. However, the phasing out of inefficient and often cheap appliances could be a burden for certain consumer groups. Consumer organisations therefore call on the Commission to encourage Member States to provide accompanying measures such as subsidies and tax reductions.

2. Scope and Definitions

According to the Commission Working Document, boilers operating in CHP plants (Combined Heat and Power; cogeneration) and boilers for district heating systems are exempted from the eco-design measures. From a legislative perspective CHP plants fall under the CHP Directive (2004/8/EC). However, this Directive does not apply any efficiency related minimum standards for CHP plants.

District Heating systems are subject to the Large Combustion Plant Directive (2001/80/EC) or the Emissions Trading Directive 2003/87/EC. Both Directives set minimum standards for the plant performance. However, smaller boilers (< 20MW) do not fall under any such regulations.

Moreover, electric storage heaters which are used for heating purposes but do not involve a water based distribution system (thus not including a boiler) are also not subject to the Working Document. However, these also produce space heat. Electric storage heaters are linked to negative environmental impacts. It is therefore recommended to also include electric non-hydronic storage heaters in the scope of the eco-design requirements.

[1] EuP preparatory study Lot 1 "Eco-design of Boilers", Final Report, Delft, 2nd of July 2007.
[2] EuP preparatory study Lot 2 "Eco-design of Water Heaters", Final Report, Delft, 30th of September 2007.

Furthermore, Indirect Cylinders are not covered by the Working Document yet, and were excluded from the scope of the preparatory study on water heaters because they are classified as a "component", not a water heater "product" under the 2005/32/EC Directive. In the meantime an addendum to the preparatory study has been prepared and the technical similarity to Storage water heaters suggests the coherence of measures for water heaters. The addendum recommends a labelling scheme, a minimum energy efficiency performance standard (MEEPS) and a CEN mandate – based on standing losses in dependence of the nominal capacity of the product. Indirect Cylinders should therefore be covered as proposed in the addendum to the preparatory study.

Recommendations

- We ask the Commission to include CH-boilers used in CHP plants and in District Heating systems with a thermal input below 20MW into the eco-design requirements.

- The same applies to non-hydronic electric storage heaters which should also be subject to eco-design requirements, either within Lot 1 on boilers or by an extra lot specifically addressing this type of heating technology.

- Indirect Cylinders should be covered by an addendum to the Working Document due to the similar demands on labelling and the necessary consistency with the Lot 2 measures for water heaters.

3. Minimum efficiency requirements (ANNEX I)

At the presentation of the preparatory study results at the Consultation Forum meeting on 18 December 2007, the contractor for Lot 1 and 2 proposed to take a three-step approach sharpening the minimum efficiency standards in 2009, 2011 and 2013. However, this has not been taken into account in the Working Document.

The energy efficiency minimum requirements envisaged in the Working Document to be implemented in 2011 are hardly more demanding than the "base case" (for boilers up to XL: 56% compared to a base case of 54%). We therefore ask for an earlier implementation.

For boilers a ban of the efficiency class G was suggested for 2009. This recommendation has not been taken up in the Working Document. However, we ask to phase out inefficient class G boilers already in 2009.

Concerning the overall heating system efficiency, a comprehensive system approach is required. In order to maximise the economical benefit of landlords and tenants resulting from the installation of an efficient eco-design heating system, measures to ensure well integrated overall systems should be adopted.
Moreover, the LLCC efficiency level (Least Life Cycle Costs) depends on the development of fuel prices[3]. It is therefore recommended to periodically revise the

[3] Higher fuel prices would result in stricter efficiency levels, because investments to increase energy efficiency would be rewarded. In contrast, lower prices would result in lower LLCC efficiency levels.

eco-design requirements concerning minimum efficiency standards in the light of energy price developments.

Recommendations

- A first tier of minimum efficiency requirements should be implemented in 2009, a second tier in 2010 (instead of 2011) and a third tier in 2012 (instead of 2013). Moreover we ask for the introduction of a fourth tier in 2015 in order to introduce a long term perspective.

- For boilers a minimum efficiency requirement corresponding to efficiency class F, or a higher efficiency class, should be included for 2009 in the implementing measure. Thus, class G boilers should be banned from 2009 onwards.

- A periodical adaptation of minimum efficiency standards in light of the development of energy prices should be envisaged in the implementing measure.

4. Emissions in use phase

We are disappointed that the Working Document does not establish minimum requirements for other emissions (except from NO_x), such as Carbon Oxide (CO), hydrocarbons and particulates.

Furthermore, a NO_x limit without a CO limit is potentially dangerous as one can reduce the emissions of NO_x at the expense of increasing CO tremendously. Hence, they need to be measured simultaneously. Otherwise there might be negative health effects.

Recommendations

- We ask for an implementation of NO_x limit values in 2010 instead of 2013. It is recommended to introduce these limit values already in 2010 and allow for a higher value (e.g. 40 ppm) for the first two years. NO_x limit values should be set at 40ppm for 2010 and at 20ppm for 2012.
- We do not support the option of higher NO_X limit values for devices with renewable input, because these products should be cleaner and more environmentally friendly as such.
- We stress the need to deal with CO emissions in terms of stringent limits in the eco-design requirements. Both appliance and installation/maintenance need to address the problem of CO concentrations in indoor air. Low CO concentrations can have negative long term health effects.
- Harmonised test methods for CO, hydrocarbons and particulate emissions from boilers are needed. However, as a measurement standard is currently not available and it would take several years to develop it, interim measures are necessary to protect consumers. We ask to include a CO limit based on existing legislation in EU Member States based on static measurements. This will prevent consumers from being potentially exposed and harmed by CO.

5. Consumer information

Consumer organisations support the inclusion of water heaters and boilers in the EU Energy Labelling scheme, because this ensures recognisability of the label for consumers. We strongly oppose however the introduction of classes A+, A++ and A+++. Also, only a certain percentage of the best products on the market should be able to obtain an A-class label. As soon as many products qualify for the best category, a timely reclassification in order to pull the market up might be necessary.
In general we refer to our comments regarding the revision process of the Energy Labelling Directive 92/75/EC[4].

The schedule regarding the labelling suggested by the Working Document is not in line with the recommendations of the Preparatory Studies and the recommendation of the consultant at the Consultation Forum meeting on 18 December 2007. Whilst the implementation of the labelling system is seen as feasible for the year 2009, the Working Document makes labelling compulsory only from 1 January 2010 onwards.

The efficiency classes of the label for boilers are based on the net efficiency values which the preparatory study defines as the ratio between the energy input (= primary energy input) and the net heat load of a building. The net efficiency is a good indicator for the energy efficiency of a specific boiler technology; however it does not provide the full picture of the environmental impact, notably concerning CO_2 emissions, of different boiler types. For instance, the net efficiency of a high-end gas-fired heat pump as defined by the preparatory study is well above 100%. In contrast, following the standard methodology, the net efficiency of a wood pellet boiler will be below 100%, although being associated to lower net CO_2 emissions than the fossil-fuelled heat pump. In other words, a boiler technology which might be best rated against net efficiency values does not necessarily represent the technology with lowest specific CO_2 emissions. Therefore we ask for information on the CO2 emission levels to be provided to consumers in a clearly understandable manner. In addition installers and retailers have a crucial role to play in informing consumers on energy efficiency and the environmental impact of different kinds of appliances. Member States should therefore also focus on the qualifications and training of installers and retailers.

Recommendations

- Inclusion of boilers and water heaters in the EU Energy Labelling scheme (this should also apply to solid fuel small combustion installations which are subject to lot 15).
- Introduction of mandatory labelling already from 2009 onwards.
- No introduction of A+, A++ and A+++ classes.
- The Commission should encourage Member States to introduce information campaigns to promote the labelling scheme to consumers and other important stakeholders such as installers and retailers. This should be introduced in the recommendations to Member States.

[4] See ANEC (ANEC-ENV-2008-G-001final) and BEUC (X/009/2008) position papers.

6. Verification of compliance:

According to the Commission Working Document a check for boilers up to size category XL is required "*that other elements at least meet default requirements*". A reference to such default requirements is missing which makes it difficult to asses whether this approach is sufficient or not.

For large boilers (XXL and above) compliance can be demonstrated according to the Commission Working Document by proving that (I) the boiler is of appropriate size for installation, (II) 'defined' components not delivered with the package are installed and (III) other system components at least meet default requirements. Also here further specifications are missing which does not allow for a proper evaluation.

Recommendation

- For water heaters it must be proven that extra energy losses (e.g. distribution losses outside the heated volume) have been taken into account. For both product groups we ask to add further specifications to the Working Document on how compliance shall be verified in detail.

7. Training and qualification

The preparatory study stresses the importance of the role of installers regarding the purchase and investment decision. Unfortunately the role of qualifications and training in order to choose the optimal appliances is not mentioned in the Working Document.

Recommendation

- We strongly believe that requirements for technical qualifications and training should be added to the Working Document.

8. ANEC/BEUC recommendations regarding ANNEX IV: Recommendations to Member States

To realise the full saving potential of the LLCC strategy, financial incentives such as tax reductions, subsidies and low-interest loans have to come into practice. We ask for a rewording of the Working Document into “Member States should initiate or further promote the introduction of subsidies, tax reductions, etc. (initially for A-class products)”.

We are convinced that instead of an early replacement also better replacement and phase out schemes are necessary for certain product groups. Cast iron heat exchangers need to be replaced with better products while electric storage heaters should be phased out.

Section 1 of Annex IV of the Commission Working Document states that "MS could consider incentives (such as tax credits) for manufacturer introducing new highly efficient models". We propose to rephrase and complete the recommendation as follows:

> *"Member States should consider incentives (such as tax reductions) for manufacturers and other key players introducing and promoting new highly efficient models. Also on the consumers' side incentives and subsidy programmes should be considered for specific product groups."*

In order to increase the pace of replacing inefficient systems in (semi-) public buildings, the Commission proposes the introduction of subsidies to Member States. We support this proposal but we would consider it beneficial to complement this recommendation by accompanying information activities for facility managers, technical staff and users in order to raise awareness for replacement programmes.

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