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Labelling Directive (2010/30/EC)

Water Heaters and storages

Comments on the working documents on possible energy labelling requirements and the draft Commission communication for the respective calculation and measurement methods

1. Introduction

BAM and UBA welcome and support the introduction of mandatory environmental requirements for water heaters.

Ambitious goals and a full realisation of efficiency potentials, e.g. through top runner approaches as demanded by the Council (Environment) on 28th of June 2007[1] are urgently necessary to reach the EU's common energy efficiency goal (20 percent improvement by 2020 across all sectors). To implement the top runner principle within the frame of the ecodesign directive the following elements are necessary:

- Ambitious requirements for which the best-performing products or techniques available on the market, including on international markets, should be taken as reference. The level of ecodesign requirements should be established on the basis of technical, economic and environmental analysis.
- Dynamic requirements by regular revision.
- Technology independent definition of requirements.
- Coupling of the Implementing measures with energy efficiency labelling and parallel adoption of labelling regulation wherever this is adequate.

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[1] "The Council STRESSES that substantial progress has still to be made and that concrete outcomes need to be delivered, particularly in the areas of climate change, and in this context RECALLS the EU's firm commitments, as decided at the Spring 2007 European Council, to ambitious targets in the context of an integrated climate and energy policy; LOOKS FORWARD to Community measures and to agreeing on an internal burden-sharing and to the proposals for implementing the Energy package, in particular in relation to energy efficiency; (…) STRESSES that governments should act to provide the adequate framework and incentives to overcome barriers that prevent Europe from fully tapping the potential of eco-efficient technologies; EU and national Environment policy must provide industry with environmental legislation setting ambitious and realistic standards, which take into account small-scale industry, and that provide benchmarks and trigger innovation, while using a creative mix of push and pull instruments that support energy and resource efficient innovations on a broad basis; POINTS TO (…) environmental regulation with lead standards such as supported by "top runner approaches" that take into account that industries need reliable and appropriate framework conditions, inter alia through implementing the Directive on eco-design requirements for energy using products" (Doc. 10796/07)

2. General Comments

2.1 Scope

We agree with the scope of labelling requirements.

In our understanding, the currently proposed measurement methods are only suitable for water heaters up to a certain heating demand. In extremely large multi-family houses with dozens or hundreds of apartments, the current measurement method does not make sense any more and we thus suggest to include an upper limit for the scope of the labelling regulation similar to the proposal under Lot 1. Also, we would like to see a calculation methodology developed for these larger housing units which should then be integrated into this regulation at the next revision at the latest.

While products using liquid and gaseous biofuels only are currently not on the market it should be checked again at the revision.

We also agree with the proposal to deal with water heaters as parts of central heating systems in lot 1. When doing so, it should be considered that no 24h test cycles are anticipated for the water heating function of (bundled) boilers; this would reduce the flexibility and feasibility of the "installer label" and increase the manufacturers' testing efforts.

We support to issue a mandate for the standardisation of the measurement and calculation methods.

2.2 Labelling requirements for water heaters

2.2.1 General

Beyond the following comments, we support the proposals on energy labels, the proposed introduction of the installer label and the common primary energy label.

Renewable energies

Classes beyond A should only be reached with the use of renewable energies (according to our estimations, good electronic gas instantaneous water heaters of the size-classes S and M could reach an efficiency class better than A).

⇨ *We ask the Commission to ensure that the "+"-classes can only be achieved with the use of renewable energies.*

Data for solar combinations (**Installer label**)

Generally, an installer label should always be issued once an installer installs a system – irrespectively of the size of the boiler or other components.

⇨ *Thus we ask the Commission to foresee an installer label for all size classes.*

We suggest to extend the scope of the installer label :The current proposal uses the lower boundaries of the efficiency classes for calculating the combinations provided by installers ("installer label"; Annex X) and thus leads to different results compared to pre-assembled solar water heaters. This is not desirable. For both the combination of solar preheat systems with water heaters by manufactures as well as by installers and/or dealers, the same measurements and calculations have to be applied.

To avoid disadvantages for individual solar combinations compared to pre-assembled solar combinations, the efficiency *etawh* of the finally installed backup heater could be used instead of the conservative standard figures as presented in Annex X of the labelling WD.

⇨ *Change labelling WD, Annex X, 3. as follows: "For the purposes of this Annex, the energy efficiency* etawhbu *of water heaters with energy efficiency classes A+++ - G shall be as follows**, as far as no individual data for* **etawh** *according to Annex VIII 4a are available**: […]"***

In order to provide legal clarity, it should be clarified in the product fiche that the values indicated on the label and in the product fiche are determined in accordance with the European requirements for standardised measurement methods in laboratories and that the real values in the installed system in the house may thus deviate from the values in the product fiche and the installer label.

delegated act on water heaters.

⇨ *We ask the Commission to add in the labelling WD, Annex III 1., 2. and 3.: "The product fiche shall include the indication: 'The values indicated on the label and in the product fiche are calculated only for standard laboratory conditions and thus may deviate from the real-life energy-consumption of the individual installation.' "*

Indication of load profiles

We would like to stress that the load profile on the Label is *declared* by the supplier of the specific device. The supplier has to ensure that that the measurement procedures and the assignment of the energy efficiency class relate to the specified load profile of the specific device.

In order to avoid oversizing, both the declared and the maximum load profile should be indicated in the product fiche. In contrast to this, for the ecodesign requirements the *maximum* load profile should be used.

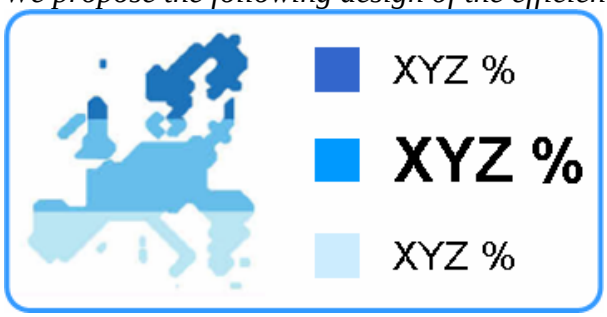
⇨ *We ask the Commission to change the WDs in a way that the* maximum *load profile is used for the ecodesign requirements and indicated in the product fiche and the* declared *load profile is used for labelling.*

Please see also our comments on noise and greenhouse gas emissions below.

2.2.2 Solar water heaters and heat pump water heaters

In view of the suggested label for solar water heaters and heat pump water heaters, we kindly ask the European Commission to review indications on the label since they seem too complex from the perspective of consumers. Furthermore is the symbol η (Eta) usually unknown to consumers and may not be the best option for declaring the average efficiency level.

⇨ *We propose the following design of the efficiency information:*



2.2.3 Refrigerants: Indication of CO_2 emissions (green house gas emissions)

Most heat pump water heaters use fluorinated refrigerants with a high global warming potential. In case of heat pump water heaters for household applications, the use of refrigerants with GWP ≤ 20 (R744, CO_2) is state of the art since they have been used for several years, notably in Asia. Furthermore, these devices offer increased energy efficiency.

⇨ *Germany requires to include information on greenhouse gas emissions (CO_2 equivalent) in the label in order to take leakages of refrigerant into account. The calculation should be based on the TEWI approach (Total Equivalent Warming Impact according to EN 378-1).*

(As far as the development of requirements within the TEWI approach needs more time and could only be realised in the revision, we support to provide a malus of 10% in energy consumption for heat pump water heaters using refrigerants with a GWP above 20 till then.)

2.2.4 Noise

Declaration and scaling of noise emissions

The noise of heat pump water heaters is considered as important and should be indicated on the label. As consumers can hardly assess the meaning of the absolute numbers of noise emission and in accordance with the labelling scheme we proposed for air conditioning appliances (Lot 10), we suggest to discuss as one possible option the introduction of noise classes. These classes could be identified with letters (coloured or uncoloured) or, in order to avoid confusion with the energy efficiency classes, with numbers or other items. However, the indication of noise on the label should be discussed in general and introduced for all product groups in the same way where noise is of relevance.

⇨ *We request the declaration of the noise emission in the label, in the product fiche and in the technical documentation. The declaration of noise emissions is necessary for every product unit which emits noise, i.e. indoor units as well as outdoor units.*

⇨ *According to the "German Comments on possible ecodesign requirements for air conditioning appliances and comfort fans" (Lot 10) we suggest to discuss the introduction of noise classes as one possibility for the indication of noise on the label. The noise classes shall be independent of technology and the different classes shall represent short-term up to long-term health and environmental aims. The gradual differentiation shall be set up as an incentive scheme to stimulate the technological progress achieved by the*

manufacturers. For deepened discussions, Germany will be pleased to present a draft for a possible set of noise classes.

2.2.5 Measurements: temperature setting

The reason for introducing the minimum storage temperature of 55 °C is not clear; Legionella protection could be an issue. In view of Annex VI we kindly ask the European Commission to explain why there is a need for a minimum temperature of 55 °C since there might be a need for differentiation between different load profiles.

2.3 Labelling of Storages

In general Germany welcomes the inclusion of storage tanks into the suggested labelling regulation. We know that four storages with a volume between 500 and 1,000 litres (compliant with the the Blue Angel label RAL UZ 124 – ENV 12977-3) fulfil the requirements. As storange tanks were not part of the preparatory study, we kindly ask the Commission to inform Member States and stakeholders in more detail about the current market situation of storage tanks. Due to a lack of market data, it is hardly possible to assess the suggested labelling scheme. This would also enable us to check if there is room to enhance the differentiation of the products in the classes above the ecodesign minimum requirements (Storages of class A cause only half as much standing losses as storages in class C which is a very large difference).

On the measurement methods:

We ask the Commission to explain, in which cases the four proposed measurement methods for calculating the standing losses actually may be used and if there is a free choice to use any of the measurement methods. Germany would like to avoid a situation where different calculation methods lead to different calculation results – opening up a regulatory "loophole". This is also important to establish a level playing field for industry and to ensure that all calculations lead to the same results. We especially would like to ask the Commission to explain the scope of the four measurement methods, i.e. if one measurement method is valid only for one type of device or applicable to various types of devices.

The ecodesign minimum requirements will ban storages in the classes G…D after three years. These classes will remain empty and will not have any useful function although the label has been introduced recently. The three remaining classes A to C cover a very broad range of storage losses where a Water Storage of class A causes only the half the standing loss of a water storage of class C (minimum requirements). Thus we would like to ask the Commission for data about the current market situation so to see, if there is scope to reduce the number of "empty" classes.

⇨ *We ask the Commission to fo data about the current market situation in order to assess if there is room to reduce the number of storage classes G…D and to use the freed space for a better product differentiation with five classes above the ecodesign minimum standards.*

3. Technical/specific Comments

<u>Ambient heat source temperatures for heat pumps</u>
There are heat pump water heaters using different kinds of air as heat source:

a) outdoor air,
b) indoor air for example from non-heated (cellar) rooms[2],
c) ventilation exhaust air (with heat recovery within the ventilation system),
d) ventilation exhaust air (without heat recovery within the ventilation system[3]).

For type a), the energy consumption for the defrosting of the outdoor air heat exchanger is not considered, because the heat exchanger starts freezing at about 3 °C and below. Further, 10 °C as average annual temperature is not representative for combinations with solar thermal systems (lower average annual temperature for the heat pumps because at high temperatures in the summer the solar system is working). In both cases, the efficiency would be overestimated. Hence, a lower outdoor air temperature or a method for the determination of the defrosting energy consumption is to be set.
For type b), non-heated (cellar) rooms are in average colder than 20 °C especially during the operation of an indoor air heat pump– this would also lead to an overestimation of the efficiency. The German standard DIN V 4701-10 which is applied for the energy efficiency rating of heating and ventilation systems sets an ambient temperature of 15°C.
For type c), the proposed ventilation exhaust air temperature (Tex) 20 °C is not applicable: Ventilation heat recovery (that means extracting the heat from the exhaust air and transferring it to the fresh air through a heat exchanger; and after that extracting more heat from the exhaust air for water heating through a heat pump) reduces the mean air temperature significantly below 20 °C; 10 °C is more applicable. Only if there is no additional heat recovery function (type d) 20 °C can be applied.
For other heat sources, standard temperatures should be used, for example according to the Ecolabel 2007/742/EC or the standard rating conditions for the EHPA quality label[4].

⇨ *We suggest to set the following source temperatures for heat pumps (labelling WD Annex VI, table 5, communication WD part 2, 2.2.3 table 5):*
0 °C: brine heat pumps,
2 °C : outdoor air heat pumps,
10 °C: water heat pumps and exhaust air (with heat recovery) heat pumps,
15 °C: indoor air heat pumps,
20 °C: exhaust air (without heat recovery) heat pumps.

Exhaust ventilation air heat pumps

We appreciate the limitation of ventilation exhaust air for heat pump water heaters (ecodesign WD Annex II, table 6). The operation of exhaust air heat pumps holds other difficulties if there is no need for ventilation but a need for water heating, for example during summer periods: The heat pump needs ventilation exhaust air and makes warm outdoor air flow into the building which warms up – in the worst case an air conditioner would be installed to make the building as cool as it was before. Such problems would be avoided if an ventilation exhaust air heat pump is operated “ventilation-led”: it only uses the air that is provided from the ventilation system independently from the water heating need.

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[2] See for example http://www.stiebel-eltron.de/en/privatkunden/erneuerbare-energien/produkte/waermepumpe/warmwasser-waermepumpen/basis-baureihe-wwp/

[3] See for example http://www.stiebel-eltron.de/en/privatkunden/erneuerbare-energien/produkte/lueftung/lueftungsgeraete-mit-warmwasser-waermepumpe/lwa-252-sol/

[4] http://www.ehpa.org/uploads/media/20100215_EHPA_TestReg_AW-HP_V13.pdf
http://www.ehpa.org/uploads/media/20100215_EHPA_TestReg_BW-WW_HP_V13.pdf
(and http://www.ehpa.org/uploads/media/20100215_EHPATestReg_DX-HP_V13.pdf)

⇨ *Introduce the declaration of the manufacturer "The heat pump water heater uses ventilation exhaust air as heat source only if there actually is a ventilation need; in other times the water heater makes use of outdoor air or is not operated." in the product fiche (labelling).*

Waste heat recovery

The proposed equations give a bonus on recovered waste heat (mainly storage losses and heat radiation losses). But this waste heat contributes to the space heating demand (and probably to a certain extent to the energy efficiency of a boiler), **not** to the water heating demand and not to the energy efficiency of a water heater. Hence, the bonus for waste heat recovery is misleading and gives wrong incentives. For the assessment of the overall building efficiency within the framework of the EPBD, the information on recoverable waste heat could be useful and should be kept in the product fiche.

⇨ *Delete the recoverable heat Q_{Rwaste} in the equations for etawh, AFC, AEC (labelling WD, Annex VIII, 4. + 5.) and Q_{distr}, (communication WD Part 2, 3. Calculation of…).*

Storage temperature for "flow-through storage systems"

There is a number of storages and storage water heaters which produce hot water in heat exchangers and contain only storage water, no drinking water. Due to the small amount of hot (drinking) water compared to the water flow there is no legionella risk. By nature, storage losses are lower, efficiencies for water heating are better. Those products could be tested with a lower storage temperature of, for example, 50°C (for the mean temperature setting and in the load profiles).

⇨ *We ask the Commission to implement this option in the follow-up working documents.*

Distribution losses for 3XS

In the communication WD, part 2, table 7, no figures for the determination of distribution losses of the load profile 3XS are defined.

⇨ *Add the figures for the determination of distribution losses of the load profile 3XS in the draft commission communication, part 2, table 7.*

4. Editorial Comments

In the communication WD Part 2 9.1 it should be "[…]Where the measurement results from the applicable standards are expressed in kWh/24h, the result will be ~~multiplied~~ **divided** by (1000/24) to arrive at values for S and Psbhp in W. […]"

In the labelling WD Annex I, the definition should be "(21) **Rated** input power […]" to be in accordance with the ecodesign WD.

In the labelling WD Annex VI, table 3, the values for warmer and colder climate have to be swapped (2nd line states "colder climate conditions" but provides warmer temperature values and vice versa).

In Annex VI of the labelling WD and in Annex II of the ecodesign WD the numeration needs to be corrected.

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