INFORSE-EUROPE
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ECOS

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Comments from INFORSE Europe and ECOS (*on behalf of Environmental NGOs*)

on the latest version of the methodology for the Ecodesign measures on Boilers (EuP Lot1)

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The following are comments on behalf of Environmental NGOs on the Working Document from the European Commission entitled "***Boiler testing and calculation method Nov.09***", in the context of the discussion of Ecodesign measures for boilers (EuP Lot1).

We welcome the general improvements and simplification made to the methodology in this document. However, we would like to point out the following issues:

- **Approach to the Required Installed Power**

We are still concerned that the model requires the installation of larger boilers than needed to cover the heat load at design temperature if the benefits of night set-back is taken into account and the re-heating therefore included.

Boilers should be able to cover the design load, i.e. the heating needed to cover the load at the outside design temperature, which is -10°C for the average climate and varies among countries.

We suggest that boilers covering the design load should be able to qualify for the "re-heating benefit", within practical limits, as explained in the following example:

Within the average climate (design outdoor temperature of -10°C), for an average temperature re-heating of 1°C the required power to maintain a +17°C temperature indoor (with internal heat sources adding 3°C to reach 20°C indoor) is (17-1)/(17- -10) = 59% of the power needed to ensure the heating during the design outdoor temperature of -10°C. This leaves an excess capacity of 41% in the heat source for re-heating. If the temperature drop during the 8 hours of night set back is 8°C (equivalent to savings of 13.6% with re-heat with endless re-heat capacity), the savings of using the night set back with a boiler just fulfilling the design capacity is about a half of the savings with a boiler with endless capacity.

Thus, it is possible to have a boiler with capacity just fit to cover the design capacity of the building and still using night set-back. This will, however, require an intelligent control of the night set-back, as the set-back period must be regulated according to outdoor temperature.

The effect of this is that "*hrsmax*" should be the same with and without reheat (TIM = 1 and TIM = 0), but then *ctim* cannot be a default value, but should rather be a function of the ratio between the boiler capacity and the design heat load.

The avoidance of over-sized boilers must also be seen in the light of less precise modelling of low-load, suggested in the new model (no measure of cycling).

It is important that the re-heating is calculated with the efficiency of the full load, which might be lower than the efficiency at lower loads.

- **Declaration of efficiencies**

It is not clear from the methodology if boilers can be declared with a lower capacity than their rated power. This would improve the usefulness of the labelling, so users could see the effect of over-sizing. In some cases, there might be an efficiency gain through a small over-sizing.

- **Buffers**

The controllability "*cband*" is a factor of a system buffer. It must be specified that only a buffer above a certain size qualifies to be used in this formula.

In the formulas for the heat losses from system buffer and solar buffer, the losses for both are based on the heating period and a tank temperature of 60°C as default (but can be varied). This is far from true for a solar tank that would only be a smaller part of the heating system. Either the period should be shortened, or the average temperature lowered for the solar tank.

The use of buffer can reduce losses of cycling by allowing longer cycling periods. That seems not included in the model.

- **Heat Pumps**

It seems questionable that the heating powers *Php1* - *Php4* are declared and not measured values. They should be measured.

The decision not to include the energy efficiency degradation with low load for heat pumps for floor heating seems unjustified, the degradation should be included.

The default degradation factor of 0.25 seems too low. Data from real heat pumps in the bottom-end of market should be included in the discussion. Also, the default degradation of fixed and staged capacity heat pumps seems too low, at least for bottom-end products. A comparison with data from products on the market would be useful.

The lack of measurement of cycling could lead to series of over-evaluation of certain heat pumps, mainly in the bottom-end of the market. Therefore, we propose that measurement of efficiency in cycling is included.

The proposed system temperatures are low for heat pumps. The Danish standard for the most popular floor heating is 50/40°C (at design temperature for wooden floor), and it would give the wrong signal to consumers to give the proposed lower temperature of 30/34°C at -7°C equal to about 31/35°C at -10°C (design temperature, average climate).

The proposed reduction in temperatures should only be allowed if the heating system is equipped with regulation of system temperatures, which is not the case in most Danish detached houses for instance, and not even in many new houses.

The accepted temperature variation of +/- 1°C in measurement of air temperature seems too high, as it could lead to significant variations. A range of +/- 0.3°C should be achievable.

Finally, the methodology only covers standby losses during the heating season, while in the EuP Lot 10 (air-conditioners) the full year standby is included. We recommend using the yearly overall standby losses in both methodologies, and we also call for a mandatory 0 Watt mode on reversible air-conditioners / heat pumps for off-season periods.

- **Fossil boilers**

There is no measurement of boilers cycling at low load. This should be included.
In an initial phase, a default degradation can be included (comparable to boilers with large degradations).

- **Electric Backup**

It seems in the model that electric backup can only work with solar and heat pumps, not with fossil boilers and CHP. It seems to be an unnecessary limitation in the evaluation methodology.

- **Pumps**

External pumps are included in the model but with higher consumption than internal pumps. This is only correct if they are not controlled by the boiler control. In case they are controlled by the boiler control, they could rather be included with same consumption as internal pumps.

END.