Bosch Thermotechnik comments on final report of Lot 1/2 preparatory study and discussion document for 1st WG2 meeting “Testing”

Bosch Thermotechnik as a world leading company of Heating and Domestic Hot Water Systems closely followed the ongoing Lot1/Lot2 review process. In this matter, we joined as well the web meeting on 02.04.2020 for the technical experts.

Thank you very much for the opportunity to give our comments in this Web Meeting and allow us to give some additional information in this letter to complete our position.

The order of our comments follows the numbering of the agenda of the meeting.

2.1 Assessing heat pump performance

Question 1a
What should test temperature regimes reflect? The average real-life temperature applications or test temperatures that are optimized for the product under test?
Are there alternative suggestions?

Bosch TT does not consider 65 °C as a reasonable testing temperature for heat pumps.
The existing testing temperatures at 35 °C and 55 °C are well established and deliver direct information for the different use-cases.
The cited study in the report is in our opinion not suitable to justify a higher temperature of 65 °C. Fraunhofer ISE, the authors of the document in question, confirmed this as well.
Furthermore, a raised temperature of 65 °C is giving wrong signals to the customers.

a.) The 55 °C medium temperature regime ensures high efficiencies for existing dwellings. It gives the guidance that heat pumps need to be operated at lowest possible differences between source and sink. The 65 °C would prevent actions for flow temperature reduction and by this decrease the efficiency of the whole system.

b.) 55 °C is an established testing point with some experience from the customers regarding the label. Changing now to higher temperatures would lead to lower efficiencies on the labels and a huge confusion for the customer.

Question 1b
If test temperatures should reflect real life situations, what are the actual seasonal average system temperatures for new built and existing dwellings? Do they differ from the ranges indicated in Table 1.

As mentioned above we consider the established temperatures as suited for the current situation.
We recommend sticking to these to keep the motivation to optimize the system.

2.4 Display $\eta_s$ on Energy Labels

Question 4
Do experts support the approach proposed here?

Bosch TT does not support the approach to show efficiencies in figures on the label.
The label shall give a quick overview of the main properties of a product.
In its existing form, each (unexperienced) customer can understand it intuitively.
Of course, some few customers urge for more information than what is available on the label. We consider the product fiche as the suitable tool for these customers.
Furthermore, we fear that additional information would overcrowd the label.
For heat pumps, 6 different efficiencies are of interest depending on heating system and climate zone (low temperature, mid temperature, average climate, cold climate, warm climate).
Especially in terms of the ongoing review, we see an additional risk of confusing the customer by the changes in $\eta_s$ due to PEF adoptions.
This can be easily covered for the existing label (see our comments for WG1), but would lead in case of shown $\eta_s$ on the label to new values (without any technical changes on the product).
2.2 Dynamic testing heat pumps

**Question 2a**

> Do experts in principle agree that the dynamic test method better represents the real-life performance of the heat pump?

To answer the question correctly the details of the method have to be defined exactly, which is not the case at the moment. We generally support the idea of the dynamic testing but think that it lacks some maturity. We see many challenges that have to be taken care of until the method can be finalized. We even see a risk that future investigations could show that the method cannot be used for heat pumps due to lack of reproducibility/accuracy or other reasons. Proving these is the unavoidable first step before any discussions of introduction can be held.

We were pleased to hear that BAM is focusing on the compensation method as we see better chances for an introduction. However, the criteria as mentioned above have to be fulfilled for the compensation method as well.

EN 14825 delivers already good results in terms of comparison to real life, because experts on this field developed it. We are convinced that a new test method should as well only be introduced by an official standardisation body. Bosch TT does not see any possibility to introduce such a big change in a test method within this review.

**Question 2b**

> Do experts agree that this dynamic test method must be further developed by standardisation bodies and eventually introduced as the new test method?

Yes, we agree that it should be developed by a standardisation body but not before it is proven that the quality of reproducibility, repeatability and accuracy is at the same level as EN 14825.
3.1 Assessing the energy performance of fuel boilers

Question 5
Do experts agree that there is no valid argument for using different test temperatures and load conditions for assessing the energy performance of a fuel boiler to heat the same dwelling with the same emitters (compared to a heat pump heating this dwelling)?

Bosch TT does not agree that the test methods have to be based on the same conditions.
Test conditions in the related standards are chosen to ensure comparability in condensing and non-condensing operation of fuel boilers. Emitter systems for fuel boilers are calculated/dimensioned according to these conditions.

Further arguments to keep the established standard test method:
- All efficiencies in between can be calculated if needed.
- Final circumstances at the customer are not known (system influence).
- Estimations show that the efficiencies of the suggested method only shows marginal deviations compared to the existing one.
- Reality can never be covered completely in any test method, but test conditions have to be easy, reliable and reproducible.
- Main market for boilers are existing buildings where the established methods are fitting fine.
- Most of the national implementations of the EPBD are using the 100 % and 30 % values.

Question 6
Do experts agree that a comparison between heat generators becomes more realistic and clearer for consumers and installers when harmonized test conditions are used?

See above

3.2 Inter- and extrapolation of test results for boilers

Question 7
Do stakeholders find it acceptable to limit boiler testing to the suggested 4 points and derive the missing points through inter-/extrapolation? Are there suggestions for alternatives, e.g. further simplification at lowest temperature test point of HT and LT?
As mentioned above, EN 15502 delivers good results regarding efficiencies calculations at different temperature levels. We assume that this could be transferred to other testing methods as well. However, we see no need for a new test method for boilers.

### 3.3 Boiler settings

#### Question 8

*Which conditions should be used regarding product settings according to the experts, and to define them?*

Bosch TT fully supports the out-of-the-box approach for domestic hot water. Coming to a fixed testing mode for this we strongly recommend to use the eco mode. Due to the fact that heating systems get less attention compared to electronic displays and the experience that factory settings are often not changed, this could make a valuable contribution to reduction of CO₂.

Worst case scenarios with low efficiencies are not suitable testing points. Additionally to the reason above, these would lead to the situation that very efficient and environmental friendly products or functions would become “invisible”.

### 4 Verification tolerances

#### Question 9

*What are experts opinions on the adjustments needed regarding verification tolerances?*

Bosch TT agrees that some of the verification tolerances have to be reviewed and can be changed. We would like to point out that a change in tests standards as discussed above would make the following answers obsolete.
Bosch TT suggests using the following verification tolerances:

<table>
<thead>
<tr>
<th>Technology</th>
<th>Current</th>
<th>Bosch TT position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel boiler</td>
<td>8 %</td>
<td>4 %</td>
</tr>
<tr>
<td>mCHP</td>
<td>8 %</td>
<td>8 %</td>
</tr>
<tr>
<td>Electric HP</td>
<td>8 %</td>
<td>8 %</td>
</tr>
<tr>
<td>Hybrid heat pump</td>
<td>Not covered</td>
<td>8 %</td>
</tr>
<tr>
<td>Inst. Gas WH</td>
<td>8 %</td>
<td>5 %</td>
</tr>
<tr>
<td>Gas storage WH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V40</td>
<td>3 %</td>
<td>3 %</td>
</tr>
<tr>
<td>NOx</td>
<td>20 %</td>
<td>Support the recommendation ((A \times x + B)) but not lower than 20 %</td>
</tr>
<tr>
<td>Sound power</td>
<td>2 dB</td>
<td>3 dB</td>
</tr>
<tr>
<td>Stand by heat losses</td>
<td>5 %</td>
<td>10 % but at least 6 W</td>
</tr>
</tbody>
</table>

5 Third party conformity assessment

**Question 10**
Do experts agree that third party conformity assessment should also become mandatory for the other (electric) appliances in the scope of the Ecodesign of space heating and water heating appliances?

Bosch TT agrees that in terms of a level playing field the TPCA should be introduced for all appliances for heating. Of course, the introduction needs clearly defined boarders. We consider the limitation to the efficiency and a free choice of the relevant modules as mandatory.

TPCA is not mandatory for any DHW systems so far and this should not be changed, because DHW is well applicable for very small power where the effort for TPCA would be too high.

Regarding DHW tanks: Standby losses are already covered by the heat generator (tanks do not transform energy itself).

All this is only valid under the consumption that no big changes within the measurement methods occur. This would make a re-investigation necessary.

**Question 11**
If yes, an assessment will be required (according to the Framework Directive art. 8.2) indicating that the proposed changes are duly justified and proportionate to the risk. Any suggestions from experts as to what should be evaluated and how to address this?
The level playing field is necessary and experiences from the boiler are comparable to the other heat generators. Free choice of modules makes the process flexible and easier to handle. A long transition period ensures sufficient time for the notified bodies and manufacturers to adapt to the new system. Additionally, the notified bodies should be trained equally.

6 Scope extension to 1 MW

Question 11
Do experts agree that extension of the scope to 1 MW boilers is a feasible method to address the currently not considered product group of virtually indestructible jet-burner boilers (80% oil-fired) in mainly public non-residential buildings and thereby addressing the huge saving potential in that sector?

Bosch TT does not support an extension of the scope of the ErP in this matter. The products between 0.4 and 1 MW are by far more complex than the products so far established in ErP. Many tailor made solutions, free choice of burner for different boilers, many different forms of applications are only a few aspects, which are not covered by the ErP today. An implementation within the MCPD (which is used to these complexity issues) would make much more sense, as the adoption to lower power is easier than an increase in the scope of ErP. Bosch TT has serious doubts that a cover of these boilers in ErP would have any effect on the customer, as the efficiency is most of the times not the main argument for them. We consider the necessary changes in the ErP as too big.

In case it should be included, the NOx values should be set to 100 mg/kWh gas and 200 mg/kWh all other fuels. A reduction in the thresholds is not reasonable, as this is technically possible but would reduce the efficiency dramatically. We cannot follow the arguments that a downgrade of the MCPD would be too burdensome for some countries. We even think the opposite. As the consultant made it very clear that an increase of the scope would not only cover boilers but as well e.g. heat pumps we consider the additional effort for market surveillance higher in case of an increase of the ErP. Furthermore following: In Europe we have the gap between 400 kW and 1 MW. But in national rules there exist no gaps (e.g. Germany up to 1 MW rule 1. BImSchV valid) and therefore exist often check rules e.g. by chimney
New ErP group: emitters and controllers

Question 12
Do experts agree that heat-emitters play a crucial role in achieving lower system temperatures in existing buildings and that there is insufficient knowledge and understanding as regards to how adequate radiator types and designs (including their hydraulic and temperature controls) can help lowering system temperatures?

Bosch TT can agree that there are possibilities of efficiency increase in theory. However, it is doubtful that the customer decision is influenced by label and eco-design. Especially in existing dwellings, we do not expect customers to change the emitters due to additional information from a new group. We see the benefits limited to new buildings.
We think that installers have the necessary know-how for emitters, but have to admit that sometimes other aspects seem to influence the decision for emitter systems.
An introduction of a new group would have to be accompanied by a big information campaign.
Otherwise, we see a risk that the consumer could get the impression that changed emitters would make a renovation of the heat generator obsolete.

Question 13
Do experts agree that a new Erp group ‘Emitters and Controls’ and related preparatory study can help further identifying bottlenecks and opportunities in achieving this large energy saving potential related to heat-emitters and their controls, for the existing building stock?

See above

Temperature Control factors in Regulation

Bosch TT fully supports the suggestions from the presentation by Mr. Bergemann.
Measurement conditions for Sound Power for HP

Bosch TT can agree to some of the suggestions made by vhk in the meeting. We as well consider 7 °C as the temperature to use for comparing tests.
The initial target of Bosch TT was as well to find settings, which represent the maximum noise of the heat pump.
However, our investigation showed that this is not possible due to the manifold influences on the sound and restrictions from the measurement equipment.
Anyhow, we still think that a review of the current method is necessary.
Our suggestion is to use a setting of A7/W55 +/-1K with the stated heat output from $P_{\text{rated}}$. The speed of the fan and pumps should be up to the control.
By this, the conditions are reproducible, repeatable and easy to implement.
Furthermore, these settings deliver more valuable information (sound power close eventually in the range of the night reduction mode) than the test point today.

Bosch Thermotechnik GmbH