EHPA comments on final report on water heaters (Lot 2) and discussion paper for WG4 meeting

February 2020

Introductory note: EHPA would like to thank the study team for the work already carried out and welcome the opportunity given to comment on the options proposed in the final reports as well as the discussion paper for WG4 meeting. Please find below EHPA’s comments on several options and recommendations addressed during the experts meeting of 20th January 2020.

1. SCOPE (SINGLE REGULATION)

Combination heaters that provide both space heating and water heating are in the scope of regulations 813/2013 and 811/2013 while the water heaters are covered by regulations 814/2013 and 812/2013. In addition, regulations 814/2013 and 812/2013 also cover storage tanks.

The content of regulations 813/2013 and 811/2013 regarding definitions, measurements and calculations for water heating energy efficiency is similar to the part of regulations 814/2013 and 812/2103 for water heaters. VHK proposed in the discussion paper for the first WG4 meeting to merge the water heating function related requirements of all appliances in the water heater ErP Regulation. EHPA is not supportive of such option as it would create confusion for industry, authorities and consumers, it could also trigger double regulation and double labelling.

However, EHPA has been considering other options on the table as “food for thought” and alternatives to be further discussed and thoroughly assessed by all stakeholders involved in this revision.

One option for further assessment is to merge 813/2013 and 814/2013 in one single regulation. We see this proposal for a merger as a simple format change, that should not lead to further changes to the content of those regulations, except the ones derived from the outcome of the review study. This new regulation could include:

- An Annex for definitions for space heaters, water heaters and combination heaters;
- An Annex on the requirements for these different products and characteristics which are already submitted to thresholds values in the current regulations;
- An Annex on measurements and calculations for the space heating energy efficiency;
- An Annex on measurements and calculations for the water heating energy efficiency;
- A dedicated Annex for storage water tanks including definitions, requirements, measurements and calculations for these products.

There could be some benefits to such a merger:

- Avoid the duplication and a possible non-alignment in case of revision of water heating part of the two regulations;
• Simplification of the formatting: due to the fact that most of the definitions, methods and calculations of the water heating function of combination heaters are already included in regulation 813/2013, this shall not increase much the number of pages for such a combined new regulation. Same goes for the merging of EL regulations 811/2013 and 812/2013;

• Merging the regulations may highlight some differences in the way some technical parameters are calculated. For example, the water heating energy efficiency for water heaters takes into account an ambient correction \( Q_{\text{cor}} \) which is not included in the calculation of the water heating energy efficiency of combination heaters.

Merging regulations could benefit to the consistency of measurements and calculations approaches for the declaration of the same performance parameters for both the two types of products.

However, such merger could also entail some challenges and drawbacks, even if it conducted from a pure formatting point of view. This could also create complex and lengthy ErP and EL legislations. This will require for manufacturers to change all compliance, marketing and product-related documentation. It will also increase the risk of misinterpretation of scope, definitions, methods and harmonized standards and requirements if they are combined, this could create some confusion on the market for quite a while, not only for manufacturers, but also for consumers, authorities etc.

Therefore, EHPA highlights that such option should be carefully assessed and if pursued should only focus on a re-formatting exercise and not to be used as an opportunity to amend both legislations with non-study related outcomes and recommendations. In addition, sufficient time should be given to the market, authorities and industry to adapt to such a change.

EHPA suggests that such an option could be further debated at the next WG4 meeting in April.

2. DEFINITIONS

2.1. Drinking water

EHPA supports the inclusion of the definition from Council Directive 98/83/EC for drinking water. In addition, EHPA suggests that the definition for drinking water should be complemented by the clarification of the term “domestic”.

As to clarify the term “domestic”, the definition could build upon the following definitions:

• **Residential water use** (also called domestic use, household use, or tap water use) includes all indoor and outdoor uses of drinking quality water at single-family and multifamily dwellings. These uses include a number of defined purposes (or water end uses) such as flushing toilets, washing clothes and dishes, showering and bathing, drinking, food preparation, watering lawns and gardens, and maintaining swimming pools.
• **Drinking water**, also known as potable water, is water that is safe to drink or to use for food preparation.

• **Tap water** (running water, city water, town water, municipal water, sink water, etc.) is water supplied to a tap (valve). Its uses include drinking, washing, cooking, and the flushing of toilets. Indoor tap water is distributed through “indoor plumbing”.

In this respect, EHPA proposes the following definition: “Water supplied to a tap from an indoor plumbing for indoor end uses such as flushing toilets, washing clothes and dishes, showering and bathing, drinking and food preparation. Outdoor uses such as watering lawns and gardens and maintaining swimming pools are excluded”.

### 2.2. Peak temperature

EHPA believes that $T_{\text{peak}}$ should be measured as a mean temperature over the draw off and not as a minimum temperature to be achieved during the entire draw-off (definition and measurement defined by EN16147). Clarification on the definition and on the aim of this $T_{\text{peak}}$ is needed. However, the regulation shall not describe any method nor calculation; it is the subject of a standard. The current framework - i.e. the definition in the Regulations together with the elements provided in the 2015 and 2018 Guidelines - is sufficiently clear. These should be the basis for drafting a clear definition in the regulation. For instance, the definition provided by the 2015 and 2018 Guidelines is: “the peak temperature $T_p$ shall be calculated as a mean value over the water draw-offs with a minimum value as specified in the tapping cycles”.

### 2.3. Off-peak product or hours (from 2018 Guidelines)

EHPA supports adding the definition but it should be considered to complement it by a definition of “smart” targeting e.g. DSM or self-consumption of on-site electricity generation. Indeed, an off-peak product is not a smart product.

According to EN16147, an off-peak product is a “water heater that is energised during specific periods of the 24h-day defined by the electricity contract with the end-user”. For the purpose of the regulation, off-peak products are energised for a maximum period of 8 consecutive hours between 22:00 and 07:00 of the 24-hour tapping pattern.

Concerning smart control products, these can be defined as a water heater that automatically adapts the water heating process to individual usage conditions by means of internal optimised controls with the aim of reducing energy consumption.

### 3. STORAGE TANK TEST & MINIMUM STORAGE TANK TEMPERATURE

#### 3.1. Storage tank test standard
EHPA believes that all standards should be accepted for the moment. The newly published version of EN15332 is mirroring of the heat loss test requirements in EN12897. However, in the future, it could be interesting to develop a single standard for the determination of the heat losses of storage tanks only, that will fit all technologies.

3.2. Minimum storage tank temperature

EHPA strongly believes that there is no need for a minimum storage temperature. The tapping profiles have been defined in order to better assess the comfort to end-users that is provided by domestic hot water appliances. The defined tapping profiles allow for smart control of domestic hot water production and thus allow for better efficiency. Making mandatory to store water or achieve during testing 65°C will be detrimental to energy efficiency and without any benefit to the consumer. Legionella protection requirements are formulated on national level, implying different usage patterns that cannot be mapped into one single harmonized provision. Therefore, legionella protection cannot be taken into account in ErP. Heating the water to 65°C does not constitute the unique mean to achieve water disinfection and ErP regulations shall not be technology prescriptive.

There is also another reason why a minimum storage temperature should not be required: some DHW systems have “direct heated” DHW where the sanitary (fresh) hot water is not stored, tanks where the energy is stored using system water, radiator water or boiler water. The “stored” sanitary (fresh) water in those cases may be very small volumes 1-2 litre (e.g. for plate heat exchangers), also having quite high-water flows during tapping. The legionella risk for these kind of products is minimal (or neglectable).

4. NEW CRITERIA FOR STRATIFICATION

EHPA supports the consideration of stratification, however, at the moment, there are no technical solutions to consider stratification, either correction on test method. If considered, EHPA believes that stratification should be considered as an information on the technical documentation. In this regard, stratification should not be considered as an additional requirement and threshold values should not be proposed.

5. TECHNOLOGY-SPECIFIC ECODESIGN REQUIREMENTS

Introductory remark: The following proposal applies to electrically driven heat pumps only. A proposal for thermally driven heat pumps will be submitted in parallel.

In addition, the following proposal is based on the data gathered on a French national level. The proposed values reflect the energy efficiency of products which are currently available on the French market. This market amounts for 2019:

- 116930 HPWH
- More than 100 000 COMBI HP on a market of 178 800 HP
The French market is the first market in EU, especially regarding DHW (HPWH and COMBI HP) representing more than 30% of the EU market in 2018. The market is mainly covering M, L, XL, XXL tapping profiles.

In this regard, EHPA proposes the following thresholds for electrically driven heat pumps (HPWH and COMBI HP):

<table>
<thead>
<tr>
<th>Water heating energy efficiency per tapping profile</th>
<th>HPWH</th>
<th>COMBI HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>3XS-XXS-XS-S tapping profiles</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>M tapping profile</td>
<td>85%</td>
<td>80%</td>
</tr>
<tr>
<td>L tapping profile</td>
<td>95%</td>
<td>90%</td>
</tr>
<tr>
<td>XL tapping profile</td>
<td>105%</td>
<td>100%</td>
</tr>
<tr>
<td>XXL tapping profile</td>
<td>120%</td>
<td>115%</td>
</tr>
<tr>
<td>3XL-4XL</td>
<td>120%***</td>
<td>115%***</td>
</tr>
</tbody>
</table>

*Non applicable because of the limit of storage volume of 36L

**No product (even if no limit for storage volume); proposed value based on the other values for other profiles; to be checked with EPREL database

***For 3XL and 4XL there is currently no data available to support a threshold proposal. For this reason, EHPA suggestion is to take to XXL tapping proposal as a reference value.

The proposals are based on a panel of about 150 HPWH and about 220 COMBI HP with all heat sources and on the following assumptions:

- Minimum values on the available performance data because HPWH and COMBI HP are already best technologies;
- A margin for limiting the exclusion of products designed for the warmer climate and thus showing lower efficiency at average climate, that are not identified on the French market;
- The current impact of the F-gas regulation: the change to a lower capacity unit because of refrigerant properties and/or safety regulation affects the energy efficiency of the unit;
- Due to the technology, combi heaters have lower efficiency than HPWH and consistency between the 2 types of products has been considered with regards to the tapping profiles.

It is important to note that, in the upcoming years, the heat pump industry will face new challenges which may have an impact on the performance of the products. These challenges include:

- The revision of the F-gas requirements and/or safety regulation;
- The change of tests conditions for ‘ambient air’, now called ‘unheated space air’, products (replacement of 20(15)°C by 15(12)°C) to be representative of the use of these products.
However, such a change will of course lead to a decrease of performance of these products, not visible on data provided by manufacturer, for example in EPREL database;

- Possible evolution of sound power level regulations; reduction of sound is often against efficiency improvement;
- Requirements linked to resource efficiency in the revised 811-814/2013 regulation and moreover circular economy regulation at European and/or national level.

Therefore, such unquantifiable impacts should be considered and integrated when setting technology dependent water heating energy efficiency requirements.

6. WET BULB TEMPERATURE

EHPA supports that the wet bulb temperature of exhaust air heat pumps should be raised to 20(15)°C and indoor air (non-heated space air) defined as 15(12)°C.

7. NOx REQUIREMENTS (FOR 3rd FAMILY GASES)

EHPA supports the introduction of the difference in NOx emissions per family by maintaining the NOx requirement as it is (56 mg/kWh) and recalculated on the methane basis for 2nd family gases. In this regard:

- Propane: measured value / 1.2
- Butane: measured value / 1.3

EHPA believes that all NOx emissions requirements shall be considered in a similar way for all products using gas.