Position paper on ESWH energy efficiency thresholds proposed at WG4 meeting 20200120

In the scope of eco-design regulation 814/2013, and because of the foreseen reduction of CC from 2.5 to 2.1, VHK proposed, at the last WG4 meeting held on the 20\textsuperscript{th} of January 2020 the following revised water heating energy efficiency thresholds:

> It was understood that the goal is not to ban more ESWH than as of today and at the opposite, to reintroduced ESWH achieving XXL, 3XL and 4XL tapping profiles.

To ensure that ESWH will achieve the proposed thresholds, the new threshold values must be adjusted to one decimal, otherwise some appliances will be phased out, just because a digit will be missing.

1. New threshold for XL tapping profile

The proposed threshold for XL tapping profile is 45\% which correspond to 37.8\% (using present CC=2.5). However, as of today, the threshold for XL is only 37\% and is the same as the threshold defined for L tapping profile according to EU Regulation 814/2013. The reason for increasing the threshold for XL tapping profile from 44\% to 45\% is not understood. In addition, it is quite likely that appliances achieving XL tapping profile will be banned. One percentage unit may not seem worth arguing about but considering that the theoretical limit is 47.6\% it makes a tremendous difference. From our perspective 45\% seem almost impossible to reach, for the reasons explained in the following section.

2. Thresholds for XL, XXL, 3XL and 4XL

2.1. Production considerations

The will to reintroduce ESWH having a high tapping profile is highly appreciated. However, test shows that the proposed limit for XL, XXL, 3XL and 4XL being 45\% (new) is very close to the maximum that can be reached and thus leaves very limited room for maneuver in production.

As a matter of fact, ESWH’s must be optimized at their maximum for the tapping profile in order to reach the energy efficiency threshold. It is not only the insulation that is optimized but also the tank volume itself that must be perfectly adjusted to the tapping profile.

For ESWH’s in stainless steel, the current tank volumes are perfectly adapted to the width of the steel "mother coils" produced at the steel mills.

However, this does not necessary mean that the tank volumes are perfectly adjusted for the tapping profiles.

The steel mills produce their "mother coils" in different standard widths and slice them in to coils that are used in the production, any scrap has to be paid for.
Our main purpose is to avoid scrap. Scrap is expensive and is not environmentally appropriate.

If we are to change our coil widths in order to design tanks that fits the tapping profiles better, it could create some environmental challenges. It could result in more scrap at the steel mill, and/or at our factory.

- More scrap wastes energy
- More scrap results in more transport on the roads.
- Scrap results in more expensive products.

In addition, in Norway the ESWH’s must be produced with a mixing valve in order to avoid burn injuries from hot water.
The mixing valve is considered as a part of the ESWH, because the ESWH can't function without it. Both cold and hot water runs through the valve during a tapping. With a closed mixing function, the hot water will lose 1 - 3°C temperature through the valve, depending on the flow rate. This affects the energy efficiency and the performance of the ESWH.

Therefore, in Norway, the proposed limits will be even more difficult to achieve because of the mandatory mixing valve.

So if the intention is to get the ESWH achieving high tapping profiles back on the market, it is advised to lower the limit to 44%.

2.2. Standard considerations

The proposed new thresholds are based on the existing testing standard. Would the testing standard be revised; the thresholds may be impossible to fulfil and ESWH may be banned from the market.

In EU Regulation 814/2013, and for ESWH in standard EN_50440: 2015, the $T_{peak}$ is defined as the temperature to be achieved at least at one point over the draw off, it is a Peak value.

However, for HPWH, in standard EN_16147: 2017, $T_{peak}$ is defined as a mean value to be obtained over the draw-off.

Changing $T_{peak}$ in EN_50440 by a mean value, would result in lower energy efficiency and thus would ban appliances from the market.

We therefore believe that current practices where $T_{peak}$ for ESWH is a Peak value, and for HPWH a mean value, should continue to apply so that ESWH can meet the defined energy efficiency thresholds.