Technical position paper

Draft ecodesign and energy labelling regulations for water heaters and storage tanks

Brussels, October 2021

Highlights

ECOS, EEB and the Coolproducts campaign followed both the preparatory study and the follow-up study for the review of the water heaters and storage tanks Ecodesign and Energy Labelling Regulations initiated in 2018. We have provided written comments all along the process.

The following comments refer to the draft ecodesign and energy labelling regulations for water heaters and storage tanks.

We are particularly concerned by the **weakened ecodesign requirements for water heaters and storage tanks**. They need to be more ambitious especially regarding the energy classes of electric water heaters. We strongly support to raise the efficiency of classes XXL, 3XL and 4XL with higher ecodesign requirements set at a minimum of 110%, applicable no later than 2025, as recommended by the IEA[1]. The efficiency of 3XL and 4XL must not be reduced compared with the current ecodesign requirements, and this is not clear in the current draft.

Furthermore, we are **concerned about the inclusion of the hydrogen readiness on the label** for water heaters and storage tanks because consumers should not be misled to choose a gas-fired water heater by the indications of H_2 readiness.

Ecodesign Regulation

Article 1 – Subject matter and scope

The sales for water heaters that deliver **boiling water** for domestic use (hot drinks, cooking) are increasing. We support their inclusion in the scope so that they can be covered by the energy

[1] https://www.iea.org/reports/net-zero-by-2050

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efficiency and information requirements. If this is not possible within this revision cycle, these water heaters should at least be included in the review clause.

Article 2 - Definitions

We propose to define 'circulation water heaters' (definition 10) combined with storage tanks as water heaters if they are marketed as such. For other circulating water heaters, they should be included in the scope with NOx emission limits and information requirements. If these appliances are made for outlet temperatures below 80°C, they should also be tested as space heaters and comply with the energy efficiency requirements for space heaters.

Article 4 - Conformity assessment

We support a third-party assessment for water heaters, but not only for internal quality control as mentioned in the current draft. This assessment shall determine the energy efficiency and the load profile with the largest reference energy (Q_{ref}) that can be supplied by the water heater.
For solar water heaters, we support that the existing de-facto third-party assessment, Solar Keymark, is maintained, and if needed supported. We propose that countries can make Solar Keymark tests a requirement for solar products that are not produced by SMEs.

Article 8 - Review

If water heaters delivering boiling water are not included in the scope of this regulation these should be included in this review clause.

Annex I – Definitions applicable for Annexes II to V

Definition (7): the definition includes "heat from other energy systems" as opposed with 'renewable sources'. Heat from other energy systems should also be coming from a renewable source, otherwise the earlier reference is useless and the efficiency calculation becomes incorrect as the heat input of the non-renewable is not taken into account.

Definition (10): The definition of 'peak temperature (T_{peak})'should be harmonised with the definition included in the ecodesign regulation for combination heaters and renamed as 'draw-off temperature T_{draw}'. We propose that it should be the average temperature achieved during draw-off.

Annex II – Ecodesign requirements

1. Ecodesign requirements for water heaters

1.1. Energy efficiency requirements

This revision of the ecodesign regulation for water heaters should be much more ambitious to be in line with the climate and decarbonisation objectives for 2030.
Fuel-fired and electric water heaters for the XXL, 3XL and 4XL sizes should be phased out. All XXL and above water heaters should have higher efficiency limits. We propose to set the efficiency requirement at 110% for XXL sizes and above to get rid of most of the fossil appliances.

We propose to increase efficiency requirements for heat pumps to the level of instantaneous water heaters for size class S and M, and for co-generators for size L and XL. There is no rationale to keep these more advanced technologies on the market if they are less efficient than instantaneous water heaters.
We propose to introduce energy efficiency requirements for circulating water heaters which shall follow the requirements of heat pump heaters operating in MT regime.

1.3. Requirements related to emissions

We propose that the allowed emissions for tests with G30 and G31 reference gases are reduced by 30% for boilers instead of increasing the NOx limits using 'normal' gas and testing with G20 test gas.
We do not support the proposed emissions limit of 420 mg/kWh and propose to reduce NOx emission limits of all cogeneration heaters to 200 mg/kWh and to 160 mg/kWh for cogeneration heaters above 400 kW, in line with the Medium Combustion Plant Directive[2]. For engines that cannot meet this limit, the manufacturers shall equip them with flue-gas NOx reduction technologies.
We strongly oppose the requirement for all gas-fired water heaters to be able to operate with a blend of fossil gas and up to 20% hydrogen. There will not be enough green hydrogen produced to replace the amount of gas currently used for water heating. Burning hydrogen in gas-fired water heaters is extremely inefficient and costly, and direct electrification should be the preferred option[3].
The requirement for gas fired water heaters to be able to operate with at least 20% biomethane might not be needed, as already today the gas networks provide up to 100% biomethane without any change of water heater needed.

1.4. Functional requirements

For electric heat pumps tested using 'indoor air' we propose that they have the same limits of use of indoor air as heat pumps using ventilation air.
After the last tapping of a load profile, the water heater should have at least one cut-out of the thermostat before the first tapping of the following day. If that is not the case, the ability of the appliance to fulfilling the declared load profile on the second day should be checked.

1.5. Material efficiency requirements

- (1) Availability of necessary spare parts

The replacement of parts and repair & maintenance information should be available during the lifetime of the appliance.

- (2) Maximum delivery time of spare parts

15 working days to deliver spare parts is too long for water heating appliances as consumers cannot be expected to live without a functioning appliance for over 3 weeks during the coldest season.

- (3) Access to repair and maintenance information

[2] The Medium Plant Directive, (EU) 2015/2193 sets the limit for NOx emissions for engines above 1 MW fuelled with gasous and liquid fuels to 190 mg(m3, which is equal to 163 mg/kWh. This is except gas engines fired with natural gas, where the limit is only 95 mg/m3.
[3] https://theicct.org/publications/hydrogen-heating-eu-feb2021

The access to spare parts and information for repairs that do not impact critical functions for safety or operation shall be available for all repairers (not only for registered but also professional repairers).

2. Ecodesign requirements for hot water storage tanks

2.1. Requirement for standing loss

While we support the proposal to allow higher losses for multivalent tanks, we are do not support this to be used to increase the allowed losses. Instead, we propose that the standing losses currently allowed are reduced from the class C to the class B for simple tanks, while multivalent tanks can have 15-Watt higher losses. Thus, we propose the following formula for standing heat loss, S: $S \leq mvc+12+5{,}93*V^{0.4}$.

Annex III – Measurements and calculations

3. Test conditions

- We support that water heaters shall be tested in normal or comfort mode, not in eco-mode or other modes that limit the supply of hot water or increase the time to start providing hot water.

- In Table 3, the 'indoor air' needs to be removed.

- In section (3) g: the 'random sequence' is problematic as it cannot be verified and should be avoided.

- In section (3)k, a procedure should be added in the case of an infinite V40 (as it is the case in latest working draft of EN 16147:2020).

- The regulation should contain specifications for NOx measurements:
  - Weighing factors 0.7 at 90% load and 0.3 at 40% load.
  - In case of multiple gas family water heaters, NOx values of all the gas families need to be tested.

- For the ventilation exhaust air in Table 4, we find that the allowed volume of exhaust (ventilation) air is unrealistic high. We propose to reduce the volumes to 2/3 of the volumes currently allowed. The remaining airflow needed for the heat pump should be supplied at outdoor temperature. For instance, an M-size heat pump water heater is allowed to use 160m^3 ventilation air per hour. The typical ventilation in a dwelling is 0.5 times the volume of the dwelling. With 2.5-meter-high rooms and 80% of air exchange via a ventilation system, the 160m^3 of ventilation air corresponds to a dwelling of 160 m^2, which typically would have a larger water heater than M-size. If the ventilation air volume is reduced to 2/3, i.e.,106m^3/h, it will correspond to a dwelling of 106m^2, which is more likely to have an M-sized water heater installed. The same applies for the test conditions for the energy labelling regulation.

- For circulating water heaters, it does not seem justified to have different temperature regime for different technologies, neither for the inlet temperature of 15°C. A hot water circulation system typically will give as inlet a mix of cold water of 10-15°C and circulated hot water of 45-50°C, on average 30°C. The supply temperature will typically be 55°C for hot water. Thus, we propose an inlet temperature of 30°C and an outlet temperature of 55°C.

- A verification is required to check whether the maximum load profile is indeed the maximum load profile that the water heater can achieve.

4. Calculation methods

We do not support the inclusion of $Q_{cor\ and}$ $F_{crtl.,}$ and we do not support the inclusion of the 'smart control coefficient' either because the testing is not straightforward and seems open to loopholes.

Annex IIIa – Transitional methods

We support that all water heaters shall be tested in normal or comfort mode, not in eco-mode or other modes that limit their supply of hot water or increase time to start providing hot water.
For hot water storage tanks, there is no need to have more choices of standards to determine storage volume and standing loss. We propose to include only EN 15332:2019 as the standard to determine these parameters.

Annex IV – Verification procedure for market surveillance purposes

A solution needs to be found to lower the uncertainty in the measurement for the efficiency of air-to-water heat pumps (8%) and the measurement for NOx emissions (20% uncertainty), as these are currently very high. We propose to reduce the tolerance for the NOx measurement in the regulation from 20% to 10% to incentivise manufacturers to reduce the emissions.

Energy Labelling Regulation

Article 7

We support the proposal to have third party conformity assessment. This assessment should cover the water heater energy efficiency and the load profile with the largest reference energy (Q_{ref}) that can be supplied by the water heater.

Annex I – Definitions applicable for the Annexes

Definition (16): The definition of 'peak temperature (T_{peak})'should be harmonised with the definition included in the ecodesign regulation for combination heaters and renamed as 'draw-off temperature T_{draw}'. We propose that it should be the average temperature achieved during draw-off.

Annex II – Energy efficiency classes

1. Energy label classes for water heaters and packages of water heaters with solar devices, hot water storage tanks and/or drain water heat recovery devices

The very low energy efficiency values for the S-size water heaters will result in a much higher energy class for an S-size water heater than for a M-size water heater, which is misleading for consumers. We propose the energy efficiency for the classes for S-size water heaters to be 25% lower than the values for M-sized water heater and that the energy efficiency for 3XS-XS-size water heaters is 25% lower than for S-size water heaters.

2. Energy label classes of hot water storage tanks

We propose that the G class is set at the ecodesign limit, which is similar with the current C-class. The energy label classes should be rescaled accordingly.

Annex III – Label for water heaters, storage tanks and packages of water heaters with solar devices and/or storage tanks and drain water heat recovery devices

5. Label gas-fired water heater, H_2-ready

We find the inclusion of information on H_2-readiness on the energy label to be highly misleading for consumers. Should there be a strong push in favour of mentioning H_2-readiness on the label from other stakeholders, we could only support this inclusion if it came with the current proposal to accompany it with an energy efficiency scale, and for the efficiency to be clearly displayed. The proposed PEF should absolutely be kept as it accurately shows the inefficiency to burn hydrogen in boilers. On a side note, we also want to highlight that a recent study has shown that the type of hydrogen that is considered here ('blue-hydrogen' based on 95% methane steam reforming) could have a higher environmental impact than directly burning methane (i.e., 'natural gas')[4].

[4] How green is blue hydrogen ? https://onlinelibrary.wiley.com/doi/full/10.1002/ese3.956

Annex IIIa – Transitional methods

For hot water storage tanks, there is no need to have more choices of standards to determine the storage volume and standing losses. We propose to include only EN15332:2019 as the standard to determine these parameters.

Annex IV – Product information sheet

1. General

We support that the Product Information Sheet shall be combined with the similar sheet required for ecodesign to a common sheet, to simplify and clarify the information.

Annex VI – Information to be provided in visual advertisements, in technical promotional material or other promotional material, in distance selling on the internet

The simple arrow with climate indication should include the word 'climate', so that it reads for instance 'Average climate' instead of only 'Average'.
For sales on the internet, the black and white arrow should not be used, only the colored one.

Annex VII – Information to be provided in the case of distance selling through the internet

There is no need for a black and white arrow for distance selling on the internet.

Annex VIII – Measurements and calculations

4. Solar device efficiency for water heating

We support to include the tank factor in the calculations, missing in the current regulation.

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