Brussels, 28 July 2020

WG4 - Water heaters – Interim report

ECOS, the EEB and the Coolproducts campaign followed the preparatory study for the review of the water heater Ecodesign and Energy Labelling Regulations and provided written comments on the preparatory study in May 2019 and on the discussion document for WG 4 in March 2020.

The following comments refer to the interim report and the discussions which took place at the stakeholder meeting on 25/06/2020.

We are particularly concerned by the **weakened energy efficiency requirements for large size electric water heaters** (from XXL to 4XL). While we see a rationale for an increase of the efficiency requirements for fossil fuel and heat pump water heaters, we see no rationale for weakening the requirements for electric water heaters and allowing these large electric water heaters on the market again. There are more energy efficient and cost-effective alternatives available than electric water heaters in this class size[1] - see 2.6.1.

The proposed revised energy label for water heaters is not acceptable. We support a thorough rescaling of the energy label for water heaters now, also taking the opportunity to change the PEF from 2.5 to 2.1 and to **revert to an A-G scale**, so as to avoid consecutive changes in the label in 2021 or 2022, and then again a rescaling to an A-G scale in 2026. The proposal to add A++ and A+++ classes while there are three empty classes (E, F and G) simply to avoid a rescale of the label is not sensible. A clear signal needs to be sent to consumers to drive them towards the most efficient technologies as soon as possible and changing the scale twice will be extremely confusing.

2.1. Scope

2.1.1 – 3XL-4XL Alignment labelling and ecodesign

We agree with the proposal to add the 3XL and 4XL load profiles in the scope of the labelling regulation to align it with the scope of the ecodesign regulation. This will increase the scope to 400 kW heat output and 2000L storage tanks.

2.1.2 – Regulation scope based on function rather than product type

All relevant solutions should be covered in the combined scope of ecodesign and energy labelling regulations, and which product is covered in which regulation is a secondary consideration. We therefore can accept to keep the current division between combi-boilers and other water heaters. We support the inclusion of waste-water heat recovery devices (WWHRD) in the package label for water heaters and the inclusion of passive flue-gas heat recovery devices (PFHRD) for combi-boilers.

1See Least Life Cycle Costs - Special review study on Water Heaters - 2016 page 29 - https://www.ia-wh-art7.eu/downloads/Special%20Review%20Water%20Heaters%20FINAL%20REPORT%2020160711__.pdf

Scope – additional remark

As we previously commented in the stakeholder process to the review study in 2019, we are concerned that the load profile of a water heater is declared by the manufacturer, but no test allows to verify whether a load profile higher than the maximum declared one can be met. Such tests should be developed to avoid misclassifications, as lower load profiles may have slightly lower efficiencies but also lower thresholds on the energy label. If the load profile declared by the manufacturer is below the maximum load profile that can be reached by the appliance, then this appliance could be misclassified on the energy label.

2.2. Definitions

2.2.2 – Hydrogen and biofuel fired

As we previously pointed out in the stakeholder process to the review study in 2019, we do not support a bonus in Ecodesign or in energy labelling for boilers that are hydrogen, biogas or other renewable gases ready. We are concerned that when such a bonus gives the boilers in question a better label class without having a higher efficiency, it will confuse consumers. We do, however, support that such boilers have a pictogram (an icon) on the energy label to inform consumers of the hydrogen/biogas readiness.

2.2.3 – Off-peak (also: 'smart' functions)

We support the proposal to include an icon on the energy label for "smart grid" and "smart control" as we are convinced that smart grid operation of water heaters will be important in the near future. A condition to get the "smart grid" icon shall be that data connection to the water heater is open access and with a standard connection hardware (such as wifi, ethernet RJ45, USB).
We do not support the inclusion of an icon for "smart monitoring" on the energy label as we are concerned that more "smart" icons will confuse consumers.
We accept that the current bonus for smart control remains and it is our opinion that the other "smart" features shall not give a bonus.
The design of the logos should be harmonised across all appliances for which those smart functions will be available. The Commission should make sure that the selected logos are understood by consumers through specific studies.

2.2.4 – Solar energy in 'heat generator'

We agree with the proposal to include solar energy and fuel cells in the definition of heat generators.

2.2.5 – Peak temperature (and definition of water heater)

We agree that an improvement of the currently unclear definition of "peak temperature" is necessary, and we agree with the suggestion that the peak temperature should be the minimum average temperature over the tapping. The peak temperature should however not be reached theoretically with a fictitious electric heating element, but rather, the water heater should actually supply the hot water with the peak temperature. We agree with the proposal to add to the definition of water heaters that a heat generator for water heating together with a housing shall be considered to be a water heater.

2.3 – Storage tanks

2.3.1 – Storage tank temperature

We agree with the proposal of defining a minimum storage tank temperature for testing for standing losses. We can accept that this minimum temperature is set to 65°C, as it is the case in EN 15332. A lower temperature, such as 55°C, is also an option, as this is a closer temperature to the one used in real-life for storage tanks. As previously stated, anti-legionella requirements should be aligned across the EU. Until then, we support the introduction of a voluntary test to assess the suitability of storage appliances for legionella thermal disinfection, indicating the additional annual energy consumption. We do not support the introduction of a minimum storage temperature requirement as it would discourage energy friendly anti-legionella innovations.

2.3.2 – Which storage tank test standard?

We support that testing for standing losses is done according to EN 15332 and for solar storage tanks EN 12977-3. In addition, we propose to include that heat exchangers shall be filled with water during tests. EN 15332 is used to test hot water tanks and in principle not for buffer tanks, but we propose to also test buffer tanks according to EN 15332. We believe that the standing loss test described in EN 15332 can also be used for buffer tanks.

2.3.3 – Correction for multivalent tanks

We support the proposal to give a bonus of 15W to tanks with more than one heat exchanger. Such appliances running partly on renewable heat sources should be given an advantage even if the additional connections increase the standing losses.

2.3.4 – Correction for stratification tanks

We support the inclusion of an evaluation of the stratification performance of tanks in the Review Article, and we urge the Commission to issue a standardisation request for the development of a test method to measure it. A good stratification is important for certain applications, including smart grid applications and solar storages, but the current lacking of a standard to measure it makes the inclusion of a stratification sign on the energy label difficult.

2.4 – PFHRT – passive flue heat recovery devices

We support the proposal to include an additional calculation in the package calculation of the water heating energy efficiency of combination heaters to account for the savings allowed by PFHRT.

2.5 – Solar devices

2.5.1 – Simplification of solar fiche calculation

We support the proposal for simplified solar heater calculations, as proposed by Solar Heat Europe and VHK, where manufacturers provide look-up tables for installers.

Regarding the need to include the storage tank size in the calculations, as presented by Assotermica during the stakeholder meeting, we do not consider that this is needed. We propose instead to state the recommended size of the hot water storage tank or buffer tank on the product fiche and to provide technical information to reduce the risk of consumers accepting installations with tank sizes that are not remotely close from the optimal size.
Regarding the inclusion of a "storage tank factor" for the energy efficiency of the tank, we support that this is included as proposed by VHK and Solar Heat Europe. In addition, **we propose** that for installations where the back-up heater and the solar installation share the same tank, and where the losses of this tank are included in the determination of the back-up water heater efficiency, **that the storage tank factor is set to the highest level** (1.3 according to the proposal in the report). We find that the method can be adapted to space heating and combi-boilers, and we would like to see specific proposals for these two applications for stakeholder meetings for these products.
We support that thermosyphon and PV-thermal systems are included in the scope, and also that the efficiency of PV thermal systems is based on a simple addition of the thermal and electric outputs of the solar collectors. If needed, the calculation method can be dealt with in a transitional method until a standard is ready.

2.5.2 – Solar water heater – label design

We support the proposal for solar heating label to include three climate zones, but we prefer to keep the simple map on the label, as in previous designs. We support that thermosyphon and PV-thermal systems are included in the scope of the labelling regulation. A simplified calculation method can be dealt with in a transitional method for the time being.

2.6 – Ecodesign requirements

2.6.1 – Technology specific requirements

We support the higher requirements for fuelled heaters and HP heaters, but we **do not support the reduction of efficiency requirements for large (XXL class and above) electric water heaters**. There are cost-effective alternatives to the low efficiency electric water heater as the special review report 2016 documented, including for the cold climate zones[2]. **We see no rationale for weakening the requirements for electric water heaters** and allowing these large electric water heaters on the market again.
Similarly, we do not support the lower efficiencies proposed for fuel HPWH than for FIWH as proposed for size class M according to table 10 and figure 5. We propose that the requirements for fuel HPWH are increased to 70%, which is the proposed requirements for FIWH. It would be a direct contradiction to the LLCC criteria for ecodesign requirements to have a technology on the market with a lower efficiency than a cheaper technology using the same fuel.

Proposal to delete reference to ambient (temperature) correction Qcor
We propose the deletion of the correction factor Q_{cor} for space heating gains from heat losses from water heaters of size XL and smaller. With the Q_{cor}, 23% of the heat loss is removed from the energy demand to compensate for assumed space heating gains from the heat loss. For a fuel fired water heater with an efficiency of 50%, this will increase the stated efficiency between 10% and 60%. For

[2] In the special review of water heaters, available at https://www.ia-wh-art7.eu/ it is documented in table 23 that for size "XXL" electric storage water heaters LCC is 20273 € while for heat pump water heaters of the same size LCC is 16170 €, i.e. some 20% lower. For heat pump water heaters that can use ventilation air, the LCC is lower and for larger water heaters than XXL, the economic benefit of heat pump water heaters will be larger. Overall for the EU, the special review found large savings of LCC by moving from electric water heaters to more efficient technologies for size class XXL and larger.

more efficient water heaters, the increase in the stated efficiency will be lower. We believe that the efficiency gain is not well documented and that for efficient water heaters it will be minimal. The factor also does not treat space heating gains equally for different types of water heaters, favouring fuel-fired water heaters over heat pump water heaters, where only 23% of the standby losses are included.

2.6.2 – Phase out pilot flame

We support the proposal to increase efficiency requirements for fuelled water heaters to the level proposed in 2.6.1, which we find will effectively ban permanent pilot flames. We agree that this is a good alternative to directly banning pilot flame.

2.7 – Information requirements (Ecodesign and Energy Labelling)

We appreciate the more logical information system proposed. We however propose that the product fiche and the technical information is combined into one technical document containing the information that will also be available in the EPREL database.
For the different types of information, we believe:

- Smart control or smart monitoring icons should not be included on energy labels.
- We support the introduction a smart grid icon.
- We support to introduce of a repairability and recyclability score on the label and on the product fiche and product information.

For the package label and fiche, see our comments to 2.9

2.8 – Product labelling of water heaters

As previous stated in the comments shared before the meeting in June, **we support a thorough rescaling of the energy label for water heater**, taking the opportunity to change the PEF value from 2.5 to 2.1 to revert to an A-G scale, so as to avoid consecutive changes in the label in 2021 or 2022, and then again a rescaling to an A-G scale in 2026.
The proposal to add A++ and A+++ classes simply to avoid a rescale of the label is not sensible. A clear signal needs to be sent to consumers to drive them towards the most efficient technologies as soon as possible. Changing the scale twice within less than 5 years will be extremely confusing for consumers. The new A-G labels for washing machines, tumble dryers, fridges etc. will be introduced in the shops as of 2021, and reintroducing A++ and A+++ classes for water heaters at the same time will defeat all the efforts made by the Commission and Member States to educate consumers on the new labels.

In the Annex 1 of the report a proposal is made for a rescaling of the label, which includes a logical distribution of label classes, but that also has three empty classes in the bottom of the scale (E, F, and G) as well as use of three classes above "A". Introducing such an imbalanced label is not acceptable. **We propose instead to rescale to a closed A-G label scale, where the proposed "A+++" is replaced with "A" and the proposed "D" is replaced with "G".** This will be a logical label scale that will be understandable for consumers and that will follow the decision to rescale all energy labels to avoid label classes above "A".

2.9 – Package fiche (and package label) of water heaters

We support an update of the design of the package label, but in accordance with our position on the label discussed in 2.8, we do not support the proposal provided in Annex E (page 128) with a scale from A+++ to G. Just like for the regular label, there should be a rescaling of the package label to a A-

G scale. We support the inclusion of three temperature zones for packages that include heat pumps or solar heating, but we preferred the previous design displaying a simple map of Europe even though it will require a different label for heat pumps and solar heating.

2-10 – Test conditions for heat pump water heaters

2.10.1 – Ambient temperatures for heat pump water heaters

For the exhaust air, we find that the allowed volume of exhaust (ventilation) air is unrealistically high and we propose to reduce the volumes to 2/3 of presently allowed volumes. The remaining airflow needed for the HP should be supplied at the outdoor temperature. For instance, an M size HPWH is allowed to use 159 m^3 ventilation air per hour and the typical ventilation in a dwelling is 0.5 times the volume of the dwelling (with 2,5m height of rooms and 80% of air exchange via a ventilation system, the 159 m^3 ventilation air corresponds to a dwelling of 159 m^2, which typically would have a larger water heater than size M. If the ventilation air volume is reduced to 2/3, i.e. 106 m^2/h, it will correspond to a dwelling of 106 m^2, which is more likely to be equipped with a M size water heater.

We are against the introduction of a heat pumps class for unheated spaces, as we find it has little practical use and can confuse consumers. If heat pumps are operating in a non-heated space with a limited amount of air, the air will automatically cool down below 15°C (for example in a garage) and a supply of air of 15°C will have to come from a heated space, and therefore should not be considered to be renewable because the cooling effect from the heat pump needs to be compensated by heating.

We welcome the introduction of temperature zones for the ground source heat pumps, but we do not see a good justification for the chosen temperatures. Unless the proposed temperatures of 5/2°C for the average zone is supported by independent evidence, we propose to only increase the brine temperatures for the average zone to +3/0 °C, which we find is a reasonable adjustment for all year operation, compared with 0/-3°C for heating season operation for space heaters.
The report does not indicate which climate zones are to be used for brine temperatures - the ones for solar heating or the ones for air source heat pumps ? This must be clarified. Given that the annual average ground temperatures are more related with insolation that with winter air temperatures, it might be preferable to use the solar heating climate zones.

2.10.2 – Heat pumps without storage tanks

We support the proposal to include these heat pumps in the scope without labelling, but with information requirements that allow them to be included in package labels. With this, the package label should include an icon for a such a heat pump heater used together with a hot water tank.

2.10.3 – Heat pumps for low temperature heat sources

We support the proposal to introduce ecodesign and information requirements for heat pumps for low-temperature district heating (40°C) and for floor heating return (25°C). At this stage we think however that introducing a label for these would be confusing for consumers.

2.10.4 – Thermodynamic heat pump water heaters and PVT water heaters

We support the proposal to include thermodynamic heat pump water heaters in the scope and to introduce information requirements for these appliances. The development of test methods should also start as soon as possible.

We support the inclusion of PVT water heaters in the scope of both ecodesign and energy labelling. As mentioned in 2.5, we support the use of a simplified calculation method that could be included as a transitional method.

2-12 – Verification tolerances

We do not support the increase of verification tolerances.

2-13 – Third party conformity assessment procedure

We support the proposal to have third party conformity assessment of water heaters. Regarding solar water heaters, we support that the existing de-facto third party assessment, Solar Keymark, is maintained, and if needed supported. We propose that this includes countries making Solar Keymark tests a requirement for solar products that are not produced by SMEs. This is in line with the proposal to subject other solar water heaters to third party conformity assessment.

2-14 – DWHRD – Drain water heat recovery device

We support to include drain water heat recovery devices in the package label. It is however unclear how the energy saved with the device is measured or calculated, and a robust method must be developed.

2-15 – Material efficiency

We support the inclusion of more ambitious material efficiency requirements in the revised regulation. Horizontal methods allowing to measure the repairability and recyclability of energy related products are available, and we urge the Commission to issue a **standardisation request to develop specific methods to assess the repairability and recyclability of water heaters**.

Recyclability

It has come to our attention that recycling the storage tanks is a very complicated operation, mainly due to the fact that the insulating foam must be removed from the internal wall of the tank, but **this foam is usually glued.** Recyclability of water heaters must be improved, and this entail no longer gluing the insulating foam to the tanks.

A specific mention of this issue should be added to 5.a. which so far only states a generic requirement to design the products so that the parts listed in Annex VII of the WEEE Directive (Directive 2012/19/EU) can be removed with the use of commonly available tools. This could be stated as follows: "*The insulating foam of water heaters shall not be glued to the inner wall of the storage tanks*".

Repairability

1. Availability of spare parts.

Spare parts should be available for a minimum of 20 years, which is the average basic lifetime reported in the preparatory study (Task 7) for several types of water heaters.

All spare parts listed in sections 1.a and 1.b shall be made available **to both professional repairers and end users.**

2. Maximum delivery time of spare parts

Section 2.b should be deleted, as no spare parts should be made available solely to professional repairers.

3. Access to Repair and Maintenance Information

This information should be available to both end users and repairers, free of charge, and without the need to register to a website to access this information.

Information requirements for refrigerant gases

The information requirement for F-gases is necessary but not sufficient, and the wording of the clause should be improved as follows:

> *"Without prejudice to Regulation (EU) No 517/2014 of the European Parliament and of the Council, for water heaters equipped with a heat pump, the chemical name of the refrigerant, shall be displayed as a commonly used and understood symbol, label or logo. Additionally, the GWP and charge of the refrigerant should be described using a standard text as follows: 'Refrigerant leakage contributes to climate change. Refrigerant with lower global warming potential (GWP) contribute less to global warming than a refrigerant with higher GWP, if leaked to the atmosphere. This appliance contains a refrigerant fluid with a GWP equal to [XXX]. This means that if 1 kg of this refrigerant fluid would be leaked to the atmosphere, the impact on global warming would be [XXX] times higher than 1 kg of CO_2, over a period of 100 years. Never try to interfere with the refrigerant circuit yourself or disassemble the product yourself and always ask a repairer.'"*

- **Low GWP refrigerants should be promoted by an energy efficiency bonus** granted to appliances using such refrigerants. Ecodesign is essential to complement the F-gas Regulation and to provide a clear market signal to support and accelerate the implementation of the F-gas Regulation.

- A **malus scheme on the energy efficiency requirements to penalise those appliances using refrigerants with the highest GWP allowed in the market** should be introduced. Based on the "polluter pays" principle appliances using refrigerants of GWP>150 should have a 10 to 15% malus on the energy efficiency requirements from the entry into force of the Ecodesign Regulation to steer the market towards the use of refrigerants with reduced harmful impact on the environment.

- **A pictogram in the energy label indicating if a product contains a natural refrigerant and/or lower-GWP (GWP ≤ 150) or a higher-GWP refrigerant (GWP > 150)** should be introduced. It is our opinion that the refrigerant information label required by Regulation (EU) 517/2014 on fluorinated greenhouse gases does not properly reach consumers due to the fact that it is displayed on parts of the product that are not visible. Hence, consumers are unlikely to receive any information to allow comparison with more environmentally friendly appliances.

- **Ban the use of HFOs**. These refrigerants – which are not covered by Annex I of the F-Gas Regulation nor affected by the Kigali Amendment to the Montreal Protocol - do not have an ozone depletion potential and some of them have the same order of magnitude as that of natural refrigerants such as CO_2 or Hydrocarbons. However, HFOs pose substantial potential risks which should not be neglected. These can include environmentally harmful and toxic by-products on production and decomposition, environmental persistence, toxic flammability and potential recycling challenges.[3]

[3] On environmental impacts of HFOs and their byproducts see for instance:

- **Other issues not covered by the report**

Real-life representativeness of test conditions and Circumvention

In the draft ecodesign regulation proposed in the report p. 118 is it stated that for the test "….*the setting to be used shall be the one that gives preference to energy efficiency rather than better comfort or lower noise or reduced running costs*….". It is important that the setting used is the default setting, and that it can be chosen easily by the user. It is also important that all tests are made with the same setting.

Low flow

Some water heaters cannot deliver hot water with flows below 5L/sec. This is not acceptable because with certain types of taps or showers designed specifically to save (hot) water, this minimum flow is not reached, and the water heater does not heat the water. It must therefore be requested that in the test method, the stated flows in the tapping profiles are kept within a maximal variation of 10%, also for tapings with flows of 3L/min. This must be introduced with the amendment of the ecodesign regulation and can later be introduced in standards.

Boiling water heaters

We see an increase in the sales of water heaters that, in addition to hot water, delivers boiling water for domestic use (hot drinks, cooking). We propose that they are included in the scope and regulated with energy efficiency requirements. If this is not possible, these should be included in the regulation for kettles that is under development at the moment.

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