Brussels, 24 May 2019

Space and Combination heaters
Comments on preparatory study (Tasks 1-7)

The current review of the Regulations will be a lost opportunity to save energy and reduce the climate impact of heating, unless all ecodesign parameters are considerably strengthened, and the rescaling of the energy labels is considered. This is not the case with the proposals put forward so far and, therefore, we urge the European Commission and the review study authors to align the ambition of these revised regulations for boilers and water heaters with the international commitments of the Paris Agreement and the decarbonisation objectives recently adopted via the EU's Long-Term Strategy 2050. Considering the long lifetime of boilers and their slow replacement rate, stringent decisions need to be implemented now if we want to achieve the 2030 objectives.

On top of this paramount issue of lack of ambition, we also discuss other aspects of the review reports and present some proposals. The reports for Task 6 and 7 mention that the proposals presented are not final conclusions. We insist to be consulted and have the opportunity to provide our feedback on the final conclusions before these are submitted to the Commission.

Furthermore, these regulations should be complemented by actions taken at Member States level, for example regarding incentives to increase the replacement rate of old inefficient appliances and dimensioning of boilers and water heaters.

Horizontal Issues

Scenarios in Task 7 to be significantly enhanced and in line with EU decarbonisation strategy.

We regret that the scenarios presented in Task 7 only cover H_2 readiness as an option. We look forward to a revised task 7 report that includes scenarios showing the impact of stricter ecodesign requirements, higher conversion rate to efficient heat pumps, rescaled labels, and other improvements developed in this paper.

It is crucial that the main scenario in the review study takes into consideration **the scenarios in the EU's Long-Term Strategy (LTS) for decarbonisation**[1], which are projected to achieve the 1.5° C global temperature target – to which the EU is committed to as part of the Paris Agreement. This is currently not the case.

The only scenarios in the LTS which achieve decarbonization by 2050 are 1.5TECH and 1.5LIFE. In these scenarios, the overall gas use in buildings is below 600 TWh[2], while currently the projection of gas use for space heating in the Task 7 report is around 800 TWh (figure 7). Additionally, 1.5TECH and 1.5LIFE both estimate that the electrification of heating in residential buildings is in excess of 30%, and

[1] https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf

[2] All gas use in buildings in 2050 is 50 Mtoe = 580 TWh for the two 1.5°C scenarios in the EC decarbonisation strategy, according to figure 44 in:
https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf

considerably more than this in service buildings – such an outcome is not included in the analysis presented in Task 7.[3]

The scenario in the LTS with an emphasis on hydrogen, and which is closest to the analysis presented by the consultants, is the Hydrogen (H_2) scenario which only achieves a reduction in GHG emissions of 80% - and is therefore incompatible with the EU's global targets to climate change mitigation. Furthermore, even the H_2 scenario from the LTS only projects a maximum H_2 mix of 50% by 2050 - which is considerably less than the 100% switch to H_2 by 2040 modelled in the ECO scenario in Task 7. Evidence to support such a switch by 2040 was not identified in any other analysis – an over emphasis on H_2 therefore risks extended dependence on natural gas.

A scenario with considerably lower gas use needs to be included in the Task 7 report. The work must be aligned with the EU's commitment to keeping global warming within 1.5 degrees.

H_2 and biogas

We do not support a bonus in ecodesign or in energy labelling for boilers that are hydrogen-, biogas- or other renewable gas- ready. We are concerned that when such a bonus places the boilers in question in a better labelling class without having a higher efficiency, it confuses consumers, who do not see additional savings when buying boilers with a better energy label. Additionally, it is very likely that most of these boilers will never effectively function using hydrogen or renewable gases, which means that the investment in the alternative gas readiness is just an extra cost that will not necessarily result in granted savings.

We do, however, support that such boilers have a pictogram on the energy label that characterise them as hydrogen-ready, biogas- ready, etc. This will force the development of clear specifications for hydrogen readiness, biogas readiness etc. and will help countries that want to promote changes of gas networks to hydrogen or biogas.

Rescale label classes

The revision of the Energy Label Regulation for space heaters must consider a review of the label classes and consider alternative options, including the necessary re-scaling to a closed A-G scale, which anyway is expected in the future. Furthermore, we propose to revise the label in a way that would allow to phase out the least efficient technologies and the technologies relying entirely on fossil fuels by 2030. In practical terms, this means that:

- Electric and non-condensing boilers are in the G class, with a view to phase them out in 2025.
- All technologies relying on fossil fuels as a main energy source are placed on the F class, with a view to phase them out in 2030.

B1 and other non-condensing boilers

We are concerned with the existing loophole allowing the sale of non-condensing B1 boilers and we urge the review study authors and the Commission to analyse how the loophole could be further limited and to suggest proposals on how to do so. In our view, limiting the exemption to gas boilers only, and only for boilers with a maximum capacity of 10kW is necessary.

[3] Refer to Figure 43 in:
https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf

We are concerned that extending the possibility of installing non-condensing boilers to C4 and C8 boilers will considerably broaden the loophole as C-type boilers are more popular than B-type boilers. Thus, we propose that the European Commission engages in a dialogue with the Member States having issues with the conversion to condensing boilers to identify other options than lowering ecodesign requirements for C4 and C8 type boilers. If the Commission and Member States conclude that lower requirements are necessary for these boilers, this must be strictly limited to gas boilers below 10 kW.

While narrowing the existing loopholes through ecodesign is crucial, we believe that this measure alone is not sufficient to ensure that the least efficient technologies are eliminated from the market in the medium term. In our view, sunset dates should be foreseen for all non-condensing boilers, with a view to exclude these technologies from the market by 2030 at the very latest. Additionally, installation of B1 or C4-C8 boilers should be subject to a much stricter authorisation procedure, providing strong evidence that these are the only viable option.

Pilot Flame

We propose to ban the use of pilot flame, as this would minimise the standby losses and the energy consumption of over-sized boilers. The current ecodesign regulation allows this technology, although the number of appliances using it is decreasing. While boilers with pilot flame can meet the minimum efficiency requirements of the current regulation, the permanent pilot flame consumes more energy than their alternatives (electric ignition). In the many cases where the boiler installed is over-sized, the energy consumption from stand-by use including the pilot flame is a high fraction of the annual energy demand and the effective annual efficiency is lowered. This lower efficiency in real-life use of many installations is not captured by the ecodesign methodology. This could be implemented with a requirement to reduce stand-by losses during periods when there is no heat demand, similar to the stand-by loss of electric equipment. The limit could for instance be 0.5 W electric, which, converted with a PEF of 2.1, will give a limit of 1.1 W primary energy.

Extending scope to 1 MW

We support that the scope is extended to 1 MW to cover all boilers smaller than those covered by the Medium-Sized Combustion Plant Directive (MCP (EU) 2015/2193). As only a few test laboratories are able to test boilers above 400 – 500 kW, it will be necessary to define a test standard that includes testing 400 kW – 1 MW boilers after installation, as it is done for boilers above 1 MW.

Other scope issue: Radiators

We are also in favour of regulations that promote better sizing and better temperature controls of radiators. We welcome a new work item within the next ecodesign Working Plan, to tackle that issue.

Third Party Conformity Assessment

We support the proposal to have third party conformity assessment of heat pumps, of gas and oil boilers, and of other boilers. Our opinion on this topic is further developed in this document.

Passive Flue Heat Retention Devices

A draft standard for testing passive flue gas heat retention devices (PFHRD) is being developed, and according to the review study, PFHRD can save up to 31% of energy for water heating. Based on this, we support that the use of PFHRD is included in energy labelling of combi-boilers for the water heater label, but not in ecodesign. In ecodesign, the inclusion of PFHRD could create a loophole, allowing sub-standard combi-boilers to meet the requirements by claiming the savings from PFHRD, even though not all users will get this benefit. The benefit will only be fully realised if there is a regular use of hot water and a minimum, constant heat demand, which is not necessarily the case during the summer months: if the use of hot water is low or if the heat demand is below a certain minimum, the benefits of PFHRD are close to inexistent.

Verification tolerances and reproducibility

Tests (by LABTQ and others) show better reproducibility (2-4%) compared to the 8% currently allowed for market surveillance of boilers' energy efficiency. The ongoing ECO-test project should confirm this. If the final results from this project confirm an inter-laboratory reproducibility of 2-4%, then the deviation that is allowed ((in market surveillance) for the seasonal energy efficiency should be reduced from 8% to 4%.

Options for Single Products

Test temperatures and performances of boilers and heat pumps

According to the review study, the boiler efficiency is up to 9 % higher in tests than in real use, and for heat pumps the SCOP is 15% higher in tests than in real use. This can be explained by higher forward and return temperatures in real use compared to testing situations, over-dimensioned boilers, or problems with the test methods (for heat pumps especially, see below). While building regulations should promote lower return temperatures, the tests for ecodesign and energy labelling should be performed with higher temperatures. The preparatory study proposes to change nominal forward temperature from 55°C to 65°C. It could also be considered to change nominal forward temperature to 60°C. The regulation should be changed to impose higher testing temperatures enabling the test results (efficiencies) to be closer to real life. This way the labelling would be more realistic and would also provide an incentive for manufacturers to optimise to the higher forward and return temperatures.

The uncertainties regarding the data from Fraunhofer-Institut für Solare Energiesysteme ISE and others that were used in the preparatory study should be clarified before concluding on the test temperatures closest to typical real-life use of the boilers and heat pumps.

We disagree with that label classes should be the same for low-temperature heat pumps and for other heaters. In page 79 of the Task 4 report, it is explained that since the energy label has higher efficiency limits for the label classes for low-temperature heat pumps, there is no incentive to choose this product. The report recommends to introduce the same label classes for low-temperature heat pumps and for other heaters. We disagree with this recommendation: the higher efficiency in the label classes for low-temperature heat pumps is achieved because these are tested with lower temperatures (35°C inlet temperature to the heating systems instead of 55°C; see Annex VII in regulation EU/811/2013). A low-temperature heat pump is therefore not more efficient than a high-temperature heat pump in the same label class, it is simply tested in a way that hints at a higher efficiency, because it cannot deliver the temperatures needed for the test of normal heat pumps.

Test temperatures for hot water storages including storage water heaters

We do not support the introduction of minimum temperature requirements for water heaters. The review study discusses the possibility of a minimum storage temperature for domestic hot water to prevent legionella. On the one hand it is important that regulation does not conflict with reasonable national regulations to prevent legionella, for instance by setting energy efficiency requirements that cannot be met when temperature requirements set at national level are followed. On the other hand, by setting high temperature requirements, incentives to find design solutions to prevent legionella with other means than high temperatures are discouraged.

Heat pumps testing standard – Dynamic testing

There is an obvious need to improve the test method for heat pumps. German Environmental Agency (UBA) and the German Federal Institute for Materials Research and Testing (BAM) report that heat pump tests according to EN 14825 are not realistic, as the test method is made with a fixed speed of compressors. This is only possible when setting the appliance on a specific test mode that is not used or even available in normal use. Market surveillance is therefore made increasingly complicated, and according to a recent study from German BAM, the test shows higher efficiencies that what can be expected in real life. We share the concerns of BAM concerning EN14825 and we support that a more realistic test method is introduced, based on the proposal from BAM.

Change of Brine Temperatures for Ground Source Heat Pumps

Standardisation groups CEN/TC113/WG10 and CEN/TC113/WG7 have suggested to change brine temperatures for ground source heat pumps upwards: from 0/-3°C (average -1.5°C) currently to average temperatures ranging from 0°C to 10°C for different climate zones. We do not support this, as the proposed temperatures are not taking into account ground source heat circuits with shorter (non-optimal) coils and can give users an unrealistic picture of the performance of the heat pump. We propose to keep the current brine temperatures.

Micro-CHP

The current regulation of the micro-CHP, including transitional methods (TM2014) gives different seasonal efficiencies for the combination of CHP and a supplementary boiler depending on whether it is put on the market as one product or as a package (with a package label). The method also gives unrealistically high efficiencies for the package label. We therefore support the harmonisation between the methodology for package labels and the methodology used for micro-CHP + boiler sold as single products.

We also support that the credit for net electricity produced (electricity produced minus electricity consumed) is weighted with a factor 2.65 as suggested in the review task 6 report of page 27.

Air emissions limit values

With the present ecodesign regulation, combi-boilers are not tested for NO_X emissions during hot water production, even though the emissions are potentially higher. We propose that the revised regulation specifies that limits for NO_X emissions for combi-boilers cover both heating mode and hot water mode.

The review clause of Regulation 813/2013 states that the review shall include an assessment of (among others) ecodesign requirements for emissions of carbon monoxide, hydrocarbons and particulate matter that may be introduced. Hydrocarbons in the form of methane emissions significantly contribute to climate change. Some sources indicate that certain internal combustion engines that can be used in CHP plants can have methane emissions in the order of 4-8 g CH_4/kWh [4], which will give a global warming effect of 140 – 240 g CO_2e/kWhe. We are also concerned that the NO_X emissions from some equipment (such as cogeneration and heat pump space heaters using oil), where the limit is 420 mg NO_X/kWh, are unnecessarily high and can be lowered. In an example of a 10kW oil-fired combustion engine, NO_X emissions vary in the range of 130-450 mg/kWh[5]. It seems, from this and other examples, that a reduction to around 200 mg/kWh is feasible for all appliances. The review study overlooked these issues and we urge the European Commission to impose stricter emission limits for these very problematic air pollutants.

Some stakeholders propose higher NO_X limits for third family gases (propane, butane etc.) in the regulation. We are concerned with the extra NO_X emissions that this will cause, which the review study needs to estimate.

Ecodesign requirements for F-gases

It is proven that the use of lower GWP refrigerants does not negatively affect the efficiency of the heat pump6. Therefore, we propose that the review further explores existing options for use of low-GWP refrigerants, including their LLCC. In addition, we propose that the review explores a bonus system as was the case with Air conditioning units using low-GWP refrigerants (with GWP equal or minor 4) – and a malus system for those appliances using high-GWP refrigerants.

Circumvention

In line with the regulatory developments in other product groups under Ecodesign and Energy Labelling regulations, the regulation should include requirements to avoid appliances can be tested in a mode that deviates from the normal, regular use (specific test mode, or appliance programmed to recognize the test conditions and react specifically to them). Addressing circumvention is important as there can potentially be serious impact, such as compromising energy and environmental savings anticipated from policy and undermining the competitive market and genuine product improvement.

Options for Packages

The preparatory study concluded that package labels are not always correctly used, or used at all, by installers. We propose, however, to keep the package label with some modifications, as it can be an efficient measure to promote, *inter alia*, solar heating (the heating source with the lowest environmental impact) or the use of heating controls. The proposal should be reviewed 5 years after its introduction.

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[4] The following references an internal combustion engine with methane emissions of 0.2 g/kWh, which is 20-40 times lower than modern, state-of-the art dual fuel (gas + diesel) internal combustion engines that will then have emissions of 4-8 g/kWh

[5] Table 2, converted from ppm in https://www.agriculturejournals.cz/publicFiles/72_2015-RAE.pdf

[6] See for instance this report: http://ozone.unep.org/en/assessment-panels/technology-and-economic-assessment-panel

Heating controls

Given that control of flow and forward temperatures from boilers to the heating system can improve efficiency by 3% more than what they can gain according to the transitional measure (Official Journal, 2014/C 207/02, temperature control class V, modulating room thermostat controlling forward temperature and flow rate), we support that the gain in efficiency when calculating seasonal efficiency is increased. If the evidence supports the increase to 8%, as discussed in the review study, we support the increase to 8%. A smaller increase is also an option.

Regarding the possibility to regulate heating controls together with heaters or in a separate regulation, we support that heating controls continue to be included in the ecodesign and energy labelling regulations for boilers and other heaters.

The market analysis does not include data on sales of advanced controls of boiler water temperature. Advanced controls should be considered as part of the ecodesign and energy Labelling options. After a certain date, thermostats and controls of boilers should include advanced features and highly accurate inside and outside temperature sensors.

There is currently a difference between the way temperature controls are treated when they are part of a heater and when they are part of a package in a package label. This difference should be eliminated.

Solar heating – packages

We agree with the Task 1 report noting that the way solar heating is treated in the regulations is problematic, especially in the way it is dealt with in package labels. Thus, we support the adjustment of the method for calculating energy savings from solar heating and the development of a simplified and improved method for including solar heating in the package label. We find the proposals from Solar Heat Europe a good starting point, but we believe there is a need for further developments in order to represent in the best possible way the savings enabled by solar heating in different climate zones.

We support Solar Heat Europe's proposal for energy labels for solar heating combined with existing boilers to be similar to the package labels for solar heating combined with new boilers. We also support Solar Heat Europe's proposal to use the three solar climate zones in the package label.

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