ehi
association of the
European Heating Industry

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EHI position paper on the Consultation Forum meeting for the review of the ecodesign and energy labelling regulations for space and water heating.

This document provides comments of the European Heating Industry on the working documents for the ecodesign and energy Label review on space and combination heaters in follow up of the consultation forum meeting of 27 and 28 September 2021. In comparison to the previous document we sent to the European Commission, it includes updated proposals on the basis of discussions at the Consultation Forum meeting as well as our position on new topics. This document is not ordered according to the importance of the topics.

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1. General – Applying to all products

1.1. An energy label fit for 55

The new energy label scheme for space and water heaters should be synchronised with the fit for 55 package. The concepts of the current scheme, developed in the early 2000s, have to be reviewed to reflect the challenges of the transition to a net-zero economy. The new energy label should be useful for end-users and investors for faster and deeper modernisation of their heating appliances according to their individual needs in support of the renovation wave and implementation of the Energy Performance of Buildings Directive.

To better understand the role of the energy label and other aspects regarding the purchasing decision of the consumer, CentERdata, commissioned by EHI, performed a Consumer study on purchase decisions regarding heating appliances (hereafter referred to as 'the consumer study'). The consumer study confirms that the energy label is considered by consumers as not effective in its current format. It shows that people are aware of the label, but that it does not trigger a switch to another heating technology.

A main reason for this phenomenon is that purchasing decisions decisively depend on the building characteristics and financial capabilities: in practise the decision to invest into A+++ instead of A or B depends on many factors which cannot be covered by an integrated primary energy scale. This situation for space and water heaters is fundamentally different compared to e.g. white goods, where the choice between models with "good" or "not so good" energy efficiency ranking implies almost always "like-for-like" choices for product characteristics beyond energy efficiency class, with price differences of order tens or hundreds of EUR, compared to thousands of EUR in case of heating.

As such, there is a huge potential for improvement (more details can be found in the detailed reasoning below). In our view, the impact assessment study should look into how the energy label can:

- differentiate energy performance between products of the same product family
- maximise the potential of incentives, matching national decarbonisation strategies and choice of energy carriers
- considering the greening of energy carriers, including green gaseous and liquid fuels
- incentivise smartness and digitalisation to empower the consumer and optimise sector coupling and actual energy use

What do we suggest?

- At least 2 years after entry into force, i.e. 2026 or 2027 (Energy labelling space heaters, Articles 3 and 4; Energy labelling water heaters, Articles 3 and 4) (see detailed reasoning below):
  - introduce a rescaled energy label that allows differentiation products from the same product family and incentives for more than only 1 product categories
  - An example of such an energy label is an energy label with 2 scales (Energy labelling space heaters, Annex II and III; Energy labelling water heaters, Annex II and III):
    - the first scale: an energy carrier specific scale[1]; this would allow:
      - differentiation of products within the same product family (see also detailed reasoning below)
      - incentives for some important products for the transition (e.g. hybrids, fuel driven heat pumps) with high upfront costs (see detailed reasoning below)
    - the second scale: a multi-energy scale[2]; this would still allow the comparability of products of other product families.

[1] Energy carrier specific scale: separate energy efficiency scale for (1) electricity (including electric heat pumps and electric boilers), (2) liquid and gaseous fuels (including fuel driven heat pumps, fuel driven boilers). Hybrids could either end up in (1) or (2) or on a separate scale for combined fuels.

[2] Multi-energy scale: scale as in the current regulation, i.e. including all energy carriers.

- apply a conversion factor for electricity of 2.1, as proposed by VHK in their interim report on Central Hydronic Space Heaters WG 1/2/3
- introduce a pictogram for the greening of energy carriers, including green gaseous and liquid fuels (Energy labelling space heaters, Annex III; Energy labelling water heaters, Annex III) (see detailed reasoning below and Section 1.2 of this paper)
- introduce a pictogram for smart appliances and digitalisation to empower the consumer and optimise sector coupling and actual energy use (Energy labelling space heaters, Annex III; Energy labelling water heaters, Annex III) (see detailed reasoning below)
- no longer compare micro-CHPs , i.e. products that generate electricity and heat at the same time, with space heaters either by removing them from the scope of the energy labelling regulation (Energy labelling space heaters, Article 1.2; Energy labelling water heaters, Article 1.2) or by including a separate energy labelling scale on the basis of a method that allows a fair comparison of the different types of micro-CHPs (Energy labelling space heaters, Articles 3 and 4, Annexes II, III and VIII; Energy labelling water heaters, Annexes Articles 3 and 4, Annexes II, III and VIII); this is to avoid that these products are misrepresented to consumers (see detailed reasoning below)
- remove the PEF for hydrogen, since it is contra productive (See Section 1.2 of this paper) (Energy labelling space heaters, Annex III, Labels 6 and 7; Energy labelling water heaters, Annex III, Point 5)

- We ask the European Commission for a thorough evaluation of the above proposals during the further development of the energy labelling measures for space and water heaters.

Detailed reasoning

From our original two-step approach (pre-Consultation Forum meeting) to a one-step approach

The timing presented by the European Commission Services at the Consultation Forum would not allow for a step in 2023. A two-step approach with a first step in 2025 and a second step in 2027 would be too close together to have effect in the market. As such, we would like to propose a one-step approach instead at least two years after entry into force, i.e. 2026 or 2027.

Our proposed timing would allow for synchronisation with the fit for 55 package. This is because our energy label proposal in full support of the upcoming fit for 55 legislations would be introduced at a time when those legislations would start to apply.

Differentiation between products of the same product family

Buildings and financial capacities of households are very heterogeneous – both on national level and across the Union. This makes greenhouse gas emissions from buildings hard-to-abate both from a technical and a social perspective. There is no one-size fits all solution to decarbonise heating and the supply of hot water in the home, different efficient and renewable solutions will be needed to offer suitable and affordable solutions to all EU citizens[3,4]. The optimal choice of space and water heating system will depend on specific local and individual personal circumstances such as the availability of local renewable sources, the availability and feasibility of the energy infrastructures, the building's properties, technical building systems, their link with the energy system and individual plans for e.g. staged renovation pathways - individual preferences and economic resources play an important role.

This is also indicated by the consumer study, which shows that the majority of consumers do not switch to more efficient technologies. Consumers who planned to replace their heating appliances were more likely to switch

[3] In-depth analysis in support of the Commission Communication A clean planet for all COM (2018) 773, Section 4.3.1
[4] Commission Staff Working Documents Impact assessment for the EU 2030 climate target plan COM(2020) 562 final, Section 2.2.2.

technologies than those whose appliances broke down. An effective energy label should give information about the most efficient product for all consumers: those who switch technologies and those who do not switch.

The recently published European Commission consumer study for air-to-air heat pumps and local space heaters showed that combining different heating appliances helps the end-user to identify more efficient products across technologies. However, it decreases the granularity and consumers are not able to differentiate between products of the same product family. It also showed that the energy efficiency value on the energy label had no significant effect in the current set up of the study. Further research is needed to assess how the differentiation between products can be improved.

As such, the current label proposal only provides useful information to those consumers who switch to a more efficient technology. To allow a consumer who does not switch to a more efficient technology to pick the most efficient product in a product family, it is important that the label differentiates between products of the same product category.

Maximising the potential of incentives, matching national decarbonisation strategies and choice of energy carriers

According to Article 7 of the energy labelling framework regulation, incentives should aim for the top two significantly populated energy efficiency classes. In practice, for space heaters (and potentially also for water heaters if rescaling is applied in the same way), there is a risk that incentives would be open to electric heat pumps only, regardless of the different national choices for energy carriers and resource adequacy. Countries with a larger share of nuclear power are "easier" to electrify than countries without nuclear. Combustion technologies operated with well-dosed volumes of renewable gases or liquids can support electrification effectively and efficiently, as was shown recently e.g. for Germany in the energy system assessment of the national German Energy Agency for a net-zero emission economy 2045.

This would be problematic for those consumers who decide not to switch to electric heat pumps, according to the consumer study this would be the majority of the consumers, because future-proof decarbonization options would be excluded from financial support a priori, risking repercussions on affordability and acceptance.

Indeed, next to electric heat pumps, other heating technologies such as hybrid units, micro-CHP and thermally driven heat pumps will be needed for the path towards 2050. These heating appliances drive the uptake of renewables or produce electricity, hence they have higher upfront cost. Without incentives, these products might not be financially attractive anymore for the consumer.

Pictogram for green energy carriers, including green gaseous and liquid fuels

To reach the 2030 and 2050 targets, consumers do not only have to choose more efficient appliances, but should also apply to appliances that are ready to work with decarbonised energy carriers.

The consumer study indicates that the majority of consumers does not switch from one heating technology to another when replacing their existing heating appliance. In addition, a substantial share of consumers who did not consider different technologies, believe they cannot replace their appliance with another technology. Finally, it also concludes that the installer plays an important role in the decision-making process.

Potentially the issues mentioned above could be partly solved by supplementary measures, e.g. awareness raising campaigns, training of installers. However, such supplementary measures take time before the effects will be visible on the market and even then electric heat pumps will be supplemented by other combustion technologies.

Therefore, all consumers, including those who purchase combustion technologies, should be able to have access to future proof technologies. They should be able to reap the benefits of a decarbonising gas grid by means of 'renewable ready' appliances (See Section 1.2 of this paper). A pictogram for green energy carriers will inform consumers about which heating appliances are renewable ready.

Rewarding smartness and digitalisation

The consumer study indicates that consumers find the energy efficiency, energy consumption and running cost the most important aspects in their purchase decision. By empowering the consumer by giving them information about their consumption, they might be able to reduce their energy consumptions and their energy bills.

Today more and more consumers are using their smart phones to connect and control their home heating systems. Moreover, heat pumps and hybrid heaters can also be coupled to rooftop PV to maximise self-consumption, either directly[5] or indirectly through thermal storage.

Smart heating systems will help to achieve system integration by stimulating the uptake of renewable energy and balancing the electricity grid through demand response and self-consumption. In addition, upgrading to intelligent room or apartment controls will add to consumers' awareness, load balancing and demand response benefits. A new label should consider these aspects and support market uptake.

Exempting micro-CHP from the scope of the energy label

Micro-CHPs are products that generate electricity and heat at the same time. Currently, because they are in the scope of the Ecodesign Regulations for space heaters, the electricity output is folded into a space heating energy efficiency value to come to an integrated seasonal space heating energy efficiency parameter.

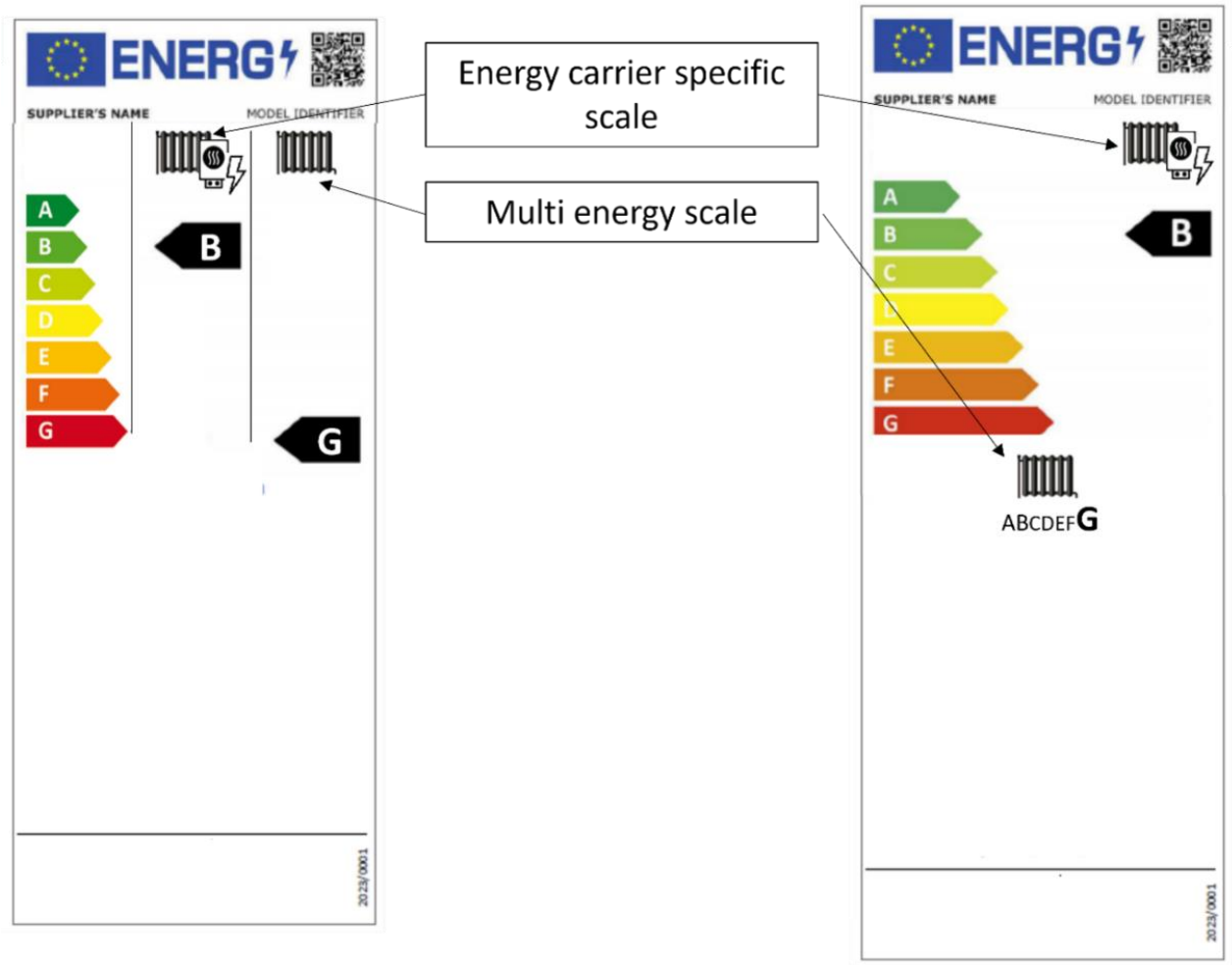
This disregards the fact that micro-CHPs produce electricity during winter. Consequently, they support resource adequacy in periods with increasing demand for electricity and dispatchable capacity, including in extreme grid conditions, caused by the simultaneous electrification of space heating and phase out of coal and, in some countries nuclear power. They reduce the strain on the electricity grid during peak demand. As such, micro-CHPs are important products from a sector integration point of view, supporting decarbonisation of heating and optimisation of overall energy system efficiency, and supporting prosumers.

To show the full potential of micro-CHPs, it doesn't make sense to compare them to space heaters on the energy label on the basis of the method in the working documents. As such, they should either be removed from the scope of the energy labelling regulation (keeping them only in the scope of the ecodesign regulation) or be included with a different energy efficiency scale on the basis of a method that allows a fair comparison of the different types of micro-CHPS in the scope of the regulation.

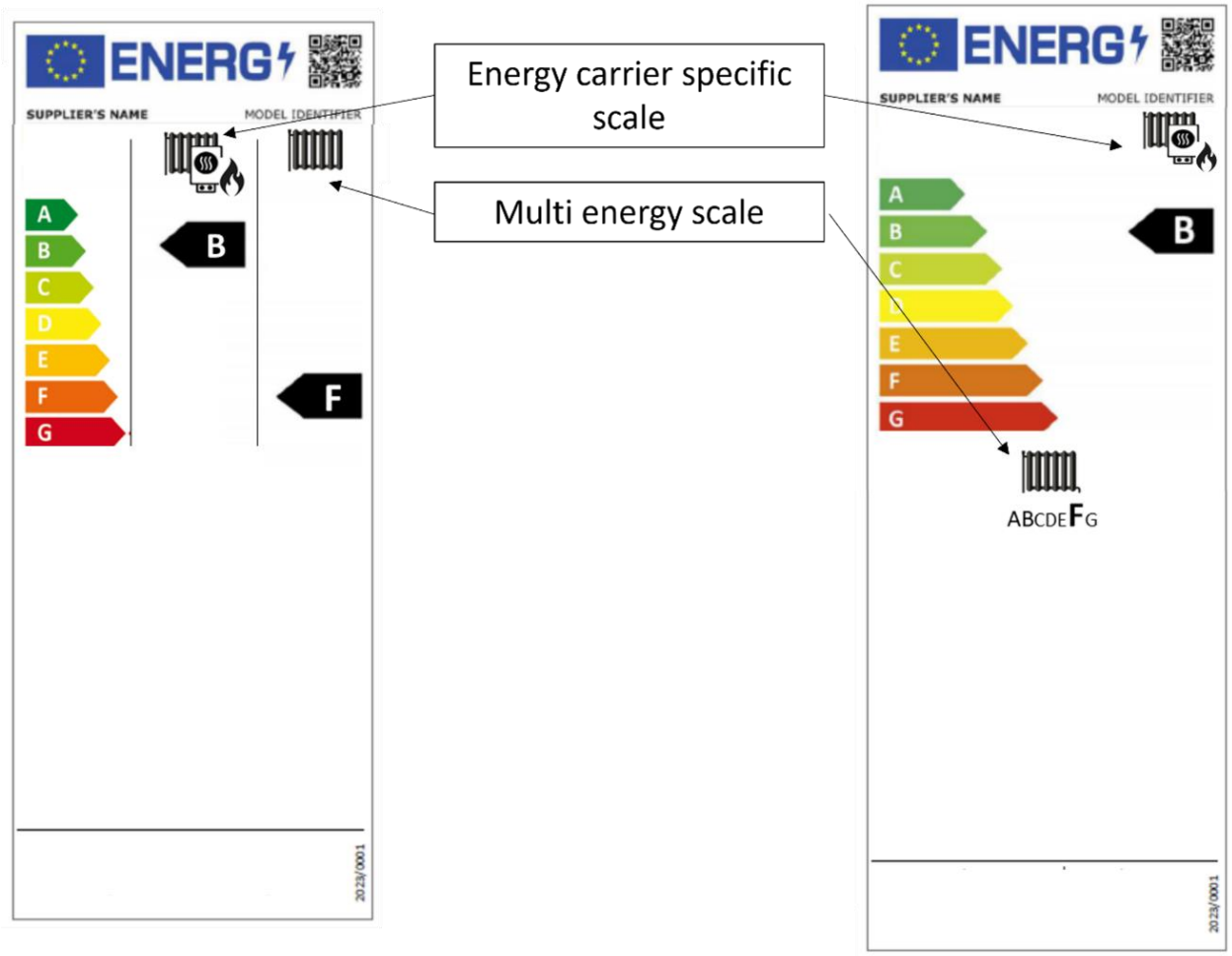
[5] directly means that the HHP runs on on-site PV production, hence the electricity comes from the house and not from the grid.

Examples of a visualisation of the proposed energy label with 2 scales

The following is an example of the visualisation of the energy label for electric appliances, including electric heat pumps, electric boilers and possibly hybrids:



The following is an example of the visualisation of the energy label for fuel burning appliances, including fuel driven heat pumps, fuel driven boilers and possibly hybrids:



The multi-energy scale for the electric appliances and fuel driven appliances would be the same.

1.2. Greening of fuels

Electrification of space and water heating with heat pumps will play a major role in the decarbonisation of heating, this will however be complemented by non-electric renewable solutions, such as the combustion of green fuels[6] by means of for example hybrid units, micro-CHP and thermally driven heat pumps. To facilitate this, there is a need to synchronise the roadmaps for the market uptake of heaters capable of processing green gases with the roadmaps for green gas uptake in the gas infrastructure.

In this respect, we welcome that the European Commission services have taken some actions to include measures on the greening of energy carriers in ecodesign and energy labelling proposals, such as the ecodesign requirement for 20% hydrogen, bio-methane and bio-fuels. We do however, believe that the proposed measures will not lead to a cost-optimal and affordable decarbonisation and that some measures will even be counter-productive.

What do we suggest?

- Deletion of the PEF for hydrogen ready appliances, because this will leave consumers with stranded investments in case of a full conversion to hydrogen (Energy labelling space heaters, Annex III, Labels 6 and 7; energy labelling water heaters, Annex III, Point 5).
- At least 2 years after entry into force, i.e. 2026-2027 (see detailed reasoning):
  - to introduce an optional pictogram on the energy label for the purpose of raising awareness, indicating the capability of appliances to use (Energy labelling space heaters, Annex III; Energy labelling water heaters, Annex III):
    - bio-methane, e-methane, bio LPG;
    - a variable share of hydrogen of up to 20 % by volume (in combination with biomethane or natural gas);
    - 100 % hydrogen.
  - to introduce an ecodesign requirement for the following gas fired appliances to work with a variable share of hydrogen of up to 20 % by volume (in combination with biomethane or natural gas) (Ecodesign space heaters, Annex II, Point 4; Ecodesign water heaters, Annex II, Point 1.3) (see detailed reasoning):
    - all models of heaters (space and combination, including B1 boilers) ≤ 70 kW;
    - new models[7] of heaters (space and combination, including B1 boilers) > 70 kW;
    - new models[6] of water heaters;
- When a technical update is needed after 2026 in view of ecodesign requirements:
  to introduce an ecodesign requirement for the following gas fired appliances to work with a variable share of hydrogen of up to 20 % by volume (in combination with biomethane or natural gas) (Ecodesign space heaters, Annex II, Point 4; Ecodesign water heaters, Annex II, Point 1.3) (see detailed reasoning):
  - existing models[8] of heaters (space and combination, including B1 boilers) > 70 kW;
  - existing models[7] of water heaters.
- In 2029:
  to introduce an ecodesign requirement for hydrogen readiness, i.e. make sure that the following gas fired appliances are capable of operating safely and efficiently with 100 % hydrogen, either after a conversion or without (Ecodesign space heaters, Annex II, Point 4; Ecodesign water heaters, Annex II, Point 1.3) (see detailed reasoning):
  - all models of heaters (space and combination, excluding B1 boilers) ≤ 70 kW;
  - new models[6] of heaters (space and combination, excluding B1 boilers) > 70 kW;
  - new models[6] of water heaters;
  - new models[6] of B1 boilers.
- Change the definition of 'hydrogen ready' to avoid that the hydrogen kit needs to be placed on the market by the manufacturer together with the boiler, this would lead to material loss in case there will be no conversion or in case of loss by the end-consumer. Instead add the conversion kit to the list of parts that should be made available in the material efficiency requirements (Ecodesign space heaters, Annex I, Point 33; Ecodesign water heaters, Annex I, Point 43; Energy labelling space heaters, Annex, Point 34; Energy labelling water heaters, Annex I, Point 44).

We are awaiting confirmation from the Commission Services on whether the above construction with new models versus existing models is in accordance with the framework. In case of a negative advice, we would be happy to discuss and provide alternative options.

[7] New models means models of which no units were placed on the market prior to the application date
[8] Existing models means models of which units were placed on the market prior to the application date

Detailed reasoning

Change of date in comparison to our pre-consultation forum position

The timing presented by the European Commission Services at the Consultation Forum would not allow for a step in 2023.

To align with our proposal for the energy label and other ecodesign requirements, we propose as a date for tier 1 at least 2 years after entry into force, i.e. 2026 or 2027.

Removal of barriers to decarbonise energy carriers

Potential barriers to decarbonise gas will be removed with the above proposal. If gas fuelled heating appliances are 'green' gas ready, Member States and regions will have maximum flexibility in selecting the energy sources most suitable for their conditions in the pathway towards 2050, which according to the Treaty on the Functioning of the European Union (TFEU) art 194 is the Member State's right.

Deleting the PEF for hydrogen

It is inappropriate to set a new PEF for hydrogen in a delegated act under ecodesign, for the following reasons:

- The PEF for grid electricity stems from the Energy Efficiency Directive.
- The suggested concept for the PEF assumes hydrogen production from fossil gas – but that it is not an option
- Envisaged concepts for large NEW hydrogen production installations rely to a large extent on electrolysis based on dedicated renewable electricity capacities, outside of electricity markets.
- The PEF for renewable based electricity in the calculation of the PEF in the energy efficiency directive is set at 1, regardless the conversion efficiency, the same should apply to the PEF for hydrogen

Furthermore, the suggested PEF correction of 1.65 on the energy label for hydrogen ready appliances will be counter-productive, it does not ensure that roll-out of decarbonized gases and roll-out of future-proof heating technologies is synchronized. Instead, we suggest ecodesign requirements ensuring that each unit is fit for decarbonization. Gas-fuelled space and water heaters that are sold today, are on the market for an average of 15 to 24 years[9]. Many Members states have not yet determined their full decarbonisation strategies in light of the choice of energy carriers. The effect of the PEF will incentivise consumers to buy fuel appliances that are not hydrogen-ready. When Member States or specific regions do decide to go to 100% hydrogen (e.g. in so called hydrogen valleys), these consumers will end up with stranded investments, because their gas-fuelled space heating appliances will not be compatible with the decarbonised gas grid.

In addition, the PEF as proposed does not take into consideration the evolution of the hydrogen market in Europe nor the priorities if the European Commission itself to heavily prioritise green hydrogen production. Hydrogen ready appliances, will not convert immediately to 100 % hydrogen, they will only convert if sufficient hydrogen is available and on the basis of the above, this will mainly be renewable hydrogen.

Indeed, the hydrogen projects collected by the European Commission through the Hydrogen Alliance this spring revealed that 84% of the 1000 projects for hydrogen in Europe (across the hydrogen value chain i.e. production, transmission, distribution, use) are based on renewable hydrogen. Production of hydrogen in these valleys will be mostly based on renewable energy by means of electrolysis not on steam reform; this is also described in the EU hydrogen strategy.

Finally, the PEF for hydrogen ready products does not take into consideration the development of current geography/business models for the use of green hydrogen including for example so called "hydrogen valleys" and more in general the local production and use of green hydrogen. According to the EU hydrogen strategy, 100 %

[9] Review study, task 5

hydrogen for heating could be available in those valleys, meaning that also in these cases, hydrogen ready appliances will work with green hydrogen not the hydrogen mix suggested by the PEF in the proposal. As an example, in the SmartQuart project in Germany solar and wind park produce green hydrogen through electrolysis, store it and use it for local heating (with H2 boilers) and transport.

Clarification of the suggested scope for the 20% and 100% ecodesign requirements

It is clear that gas burning appliances will be connected to the same gas grid, regardless of whether they are space heaters, water heaters or combination heaters. For this reason, our industry has continued working on a more expanded proposal regarding green fuels based on a cost benefit analysis, but also considering a realistic timing and technical feasibility.

The result is a larger scope of our proposal and different timings for different product types. The main reason is that from a design perspective point of view, it will be impossible to redesign all appliances in function of the proposed ecodesign requirements for hydrogen at the same time.

As such, the proposal gives priority to the most common appliances for the renovation market, i.e. heaters ≤ 70 kW. By making these products future proof first, the biggest impact on consumers due to stranded investments would be avoided.

For the other heating appliances, there will be 20% hydrogen and 100 % hydrogen-ready appliances available at the same time as for heaters ≤ 70 kW. However, we request not require a full redesign of the models for which products were already available on the market before the start date of the requirements.

B1 boilers are being phased out, as such, when in a certain region, a decision will be taken to go to 100% hydrogen, these appliances will need to be replaced by more efficient solutions.

1.3. Roadmap for banning of fossil fuels from boilers

Gas-fuelled space and water heaters (i.e. condensing boilers, micro-cogeneration including fuel cells, gas fired heat pumps and hybrid heat pumps) today typically burn fossil fuels, this is due to the fact that today there is not enough renewable gas available (e.g. green hydrogen, biomethane, green e-gas) that can be injected into the gas grid. This situation is similar to that of electricity two decades ago. Since then, the renewables share in electricity production has grown significantly, the same is expected to happen for gas in the next decades.

In response, gas-fuelled space heaters are moving towards a 'green' gas readiness so they are able to burn green gas, i.e. biomethane, e-methane, green hydrogen in blended and pure form (see Section 1.2 of this paper).

Gas fuelled heating appliances on the market today are capable of working with up to 100% bio- and e-methane and some condensing boilers can already accommodate a variable share of hydrogen of up to 20%. In addition, there are fuel cells[10] on the market today that are already capable of functioning with 100 % hydrogen. Boilers and micro-cogeneration units that function with 100% hydrogen are under development and in the field-test phase. As such, we would like to make clear that there is no such thing as a fossil fuel boiler or heating appliance.

It is not in line with the TFEU to 'ban' use of fossil fuels indirectly, via an internal market prohibition for placing-on-the-market of combustion technologies that are future-proof and fit for zero-emission and renewable fuels.

The suggestion made in Section 1.2 of this paper is our EHI proposal to phase out fossil fuels from heating appliances. Indeed, to go beyond what is already possible today, we propose a combination of the requirements

[10] Fuel cells have an overall efficiency of more than 85% (electricity and heat) and work by combining hydrogen produced from the fuel and oxygen from the air to generate power, water, and heat. These systems can be used in cities, factories, trade and commerce, data centers, critical infrastructure (e.g. telecommunications, hospitals) and electric vehicle charging infrastructure.

(suggested in Section 1.2 of this paper) that will ensure that combustion technologies, including gas boilers, will be ready work with the most likely combinations of decarbonised gases.

What do we suggest?

To use our proposal for the greening of fuels (Section 1.2) as a roadmap to decarbonise gas appliances in response to the request from several Member States during the Consultation Forum meeting.

1.4. Third party conformity assessment (TPCA)

We welcome the proposal to introduce TPCA for space heaters (Ecodesign space heaters, Article 4). The practice over the past 20 years has shown that TPCA has resulted in bringing test houses up to the required standards. For heat pumps, this will also facilitate the recognition of Ecodesign declared data for national subsidy purposes and help harmonise national certification requirements that are required in light of national requirements for EPBD.

The proposal on 3rd party conformity assessment in the working documents for the ecodesign for space heaters should be further clarified. During the Consultation Forum meeting, VHK clarified that the 3rd party conformity assessment would apply for all appliances to energy efficiency, this could be misinterpreted in the working documents. In addition, it is also unclear whether the capacity of 70 kW only applies to heat pumps and hybrid heaters or also to heaters using gaseous or liquid fuels.

We also welcome the proposed self-declaration conformity assessment procedure to water heating energy efficiency values (Ecodesign water heaters, Article 4) because the additional testing procedure costs would outweigh the expected benefits. Indeed, in the Energy Labelling and Ecodesign Regulations, the energy efficiency of water heaters and combination heaters is a lengthy and complex measurement, which uses an average 24-hour measurement cycle with regular water draw-offs from 7:00 to 21:30, according to the declared load profiles.

What do we suggest?

- Limit the TPCA to space heating energy efficiency values for all products (Ecodesign space heaters, Article 4): According to the working document TPCA applies to all parameters for heaters using gaseous or liquid fuels. We request to limit TCPA to P4 and P1, as is the case today. This is to avoid that all boilers will need to be retested to ensure TPCA for all parameters in the product information, the product information sheet and the technical documentation.
- Limit the scope of TPCA to 400 kW for all products (Ecodesign space heaters, Article 4): If the scope were limited to 70 kW, boilers > 70 kW and ≤ 400 kW would no longer have to be third party tested. If the intention is to expand TPCA to all heaters using gaseous or liquid fuels ≤ 1 MW, there is a unlevel playing field with the heat pumps and hybrids for which it is clear the limit is 70 kW; in addition, there are only a very limited number of test laboratories available in the EU for such heaters > 400 kW (see detailed reasoning below and Section 2.3 of this paper).
- Allow a free choice of modules, except module A, which concerns self-declaration (Ecodesign space heaters, Article 4): The proposal in the working document is limited to modules B in combination with C, D, E as described in Annex II to Decision No 768/2008/EC. A free choice of modules would help manufacturers choose the module options best suited to their way of working and the products at stake (e.g. whether in small / large series, small / large capacity products, depending on existing auditing schemes and management systems, etc.).
- Allow an appropriate transition period (Ecodesign space heaters, Annex II): An appropriate transition period shall be set, for example to allow enough Notified Bodies to be accredited in Member States for the different technologies and for space heater manufacturers to adjust their assessment procedures.
- Apply TPCA only to units of new models (Ecodesign space heaters, Article 4): The TPCA should be applied to a unit of a new model before placing such unit on the EU market. Units of a model already placed on the EU market should abide by the current rules.

Detailed reasoning

Why 3rd party conformity assessment for fuel burning appliances should be limited to products ≤ 400 kW

Limited number of external laboratories that can test products > 400 kW

There are very few independent laboratories (less than 5 in the EU) able to test such big capacity boilers in a certified environment and even if sufficient time is given to adapt the laboratories, the increased heat discharge and the need to provide water flow at constant temperature a reliable energy efficiency test would remain an issue. This issue becomes more prevalent for boilers closer to 1 MW.

The existing national requirements in some Member States, e.g. in Germany, for these large boilers are on the basis of the combustion efficiency not the energy efficiency as required for the ecodesign and energy labelling regulations. For these measurements only the temperature of the flue gases and CO2 in the flue gases need to be measured. As indicated in the previous paragraph, for the energy efficiency measurements according to the ecodesign and energy labelling regulations, more parameters need to be measured and controlled. As such, laboratories for these large products are not available.

Scope limitation of TCPA to 400 kW for heaters using gaseous and liquid fuels – factory acceptance test

Not all manufacturers have an inhouse laboratory that can test the product in the range of 400 kW to 1 MW.

The same applies as for the external labs. Currently, only the combustion efficiency of large products was measured, not the energy efficiency according to ecodesign and energy labelling.

On site testing

On-site-testing for products above 400 kW, as proposed during the Consultation Forum will not lead to reliable and appropriate results.

An appliance can only be tested on site, when it is already installed at the consumer's premises, i.e. after it is placed on the market. This is in conflict with the ecodesign framework, according which the ecodesign requirements apply at the time of placing on the market, not afterwards.

Slide 22 'Third Party: Conformity Assessment versus Certification' of the 'CF_slide_deck_spaceheaters_ED_FINAL_circa.pdf), shown during the CF, states 'Before placing on the market'. For on-site testing this is not correct.

Ecodesign and third party conformity assessment require reproducible, comparable and reliable testing results. 'On-site-testing' is not appropriate to meet those criteria for heating appliances. This includes – beside the naturally given impact of the building/heating system itself – the difficulty to achieve the given load-conditions for testing (part-and especially full-load) but also the quality and tolerances during the measurement.

1.5. Material resource efficiency

Repair and spare part availability are general practices for the European heating industry. Indeed, rather than prematurely being replaced, they typically last longer than their expected end-of life. As such, the European heating industry supports introducing spare part availability requirements in the ecodesign regulations, however, we do have some concerns.

The requirements should be limited to products ≤ 70 kW. For heaters > 70 kW, spare parts are not always in stock since there are fewer numbers sold. In addition, these products are often custom made and rely on maintenance contracts for repair;

Requirements for space and combination heaters and water heaters and hot water storage tanks should be aligned, there is no reason for different requirements.

1.5.1. Availability of the necessary spare parts

The working documents consider that all components of space, combi and water heaters should be available as spare parts for a period of 10 years.

We believe though that spare parts should be limited to an exhaustive list of most common spare parts which can either be included in the regulations or in the relevant European standard. It is unclear to us what the reason is for suggesting a non-exhaustive list for space heaters, while for the other new ecodesign regulation and proposals on the way, the list is limited to those spare parts that most often break down.

As a principle, components that should be targeted are components that:

- will not operate for a period of 10 years (e.g. expansion vessels, pumps, hydraulic valves);
- are needed for servicing activities (gaskets, special connectors, installation accessories);
- are needed for maintenance, ware out and have a high failure rate. (e.g. ignition sparks, electric fuses, sensors).

However, if these parts have a limited storage life (printed circuit boards, including remote controls) or are very expensive or cause very high service costs (e.g. components of the refrigerant circuit including heat exchangers), they should not be included in the list. In which case it might be more useful to offer a new device (e.g. outdoor unit) instead of a component (e.g. heat exchanger) or to find any goodwill solution in light of economic efficiency from the view of the end-consumer.

What do we suggest?

- Specific spare parts should remain available for 10 years (Ecodesign space heaters, Annex II, point 5(1); Ecodesign water heaters, Annex II, point 1.5(1)) (see detailed reasoning). These spare parts are:
  - circulator (including flow rate control),
  - ignition spark plugs,
  - sensors (including thermostats, pressure gauge),
  - electric fuses,
  - proprietary seals and connection means (special bolts, nuts, washers, clamps)
  - thermostats and sensors,
  - fan motors;.
- We would like to request an exemption for products that are no longer available on the market, e.g. due to technical problems and/or safety issues (Ecodesign space heaters, Annex II, point 5(1); Ecodesign water heaters, Annex II, point 1.5(1)).
- It should be made clear in the regulations that if a model does not include the spare parts listed as specific spare parts (listed in the above bullets), these spare parts do not have to be made available for these products (Ecodesign space heaters, Annex II, point 5(1); Ecodesign water heaters, Annex II, point 1.5(1)).

Detailed reasoning

The reason for the suggested length of the spare part availability is that the requirements apply to the manufactures of the space and water heaters, while these manufacturers are not always responsible for the spare parts (e.g. in case of OEMs, components manufacturers by other manufacturers, spare parts supplied by whole sellers). Longer spare part availability might impede spare part agreements between manufacturers of space and water heaters who need to be compliant with these requirements and e.g. the OEMs, component manufacturers, whole sellers who have no legal responsibility. Alternatively to an agreement, manufacturers could buy a number of spare parts from these other parties. However, a wrong estimation would lead to non-compliance in case of underestimation and severe material inefficiency in case of over estimation. In addition, there is no guarantee that the spare parts

that are stored in warehouses today, can still be sold in e.g. 8 years' time, new legislations[11] can prohibit the use of certain substances making the spare parts obsolete, again with sever material inefficiency as a result.

1.5.2. Maximum delivery time of spare parts

The working documents include a maximum delivery time of spare parts of 15 days (Ecodesign space heaters, Annex II, point 5(2); Ecodesign water heaters, Annex II, point 1.5(2)).

In many cases, the spare parts are the responsibility of the dealer or wholesaler, rather than the manufacturer, meaning that the current requirement does not take into account the normal supply chain.

In addition, even if the manufacturer is responsible for the sales of the spare parts, they often work with external shipping and/or logistics companies.

What do we suggest?

- To clarify the legal consequences if the manufacturer cannot comply with this requirement because of this and question whether an exemption for such cases should be put in place.
- Instead of setting the requirement on the delivery time, we suggest to set the requirement on the date of sending (Ecodesign space heaters, Annex II, point 5(2); Ecodesign water heaters, Annex II, point 1.5(2)), i.e.:

  'During the period of the mandatory availability of spare parts, the manufacturer, importer or authorised representative shall ensure that the sending of the spare parts within 15 working days after having received the order.'

- To include exemptions related to force majeure and delayed deliveries in the supply chain e.g. due to material shortages (Ecodesign space heaters, Annex II, point 5(2); Ecodesign water heaters, Annex II, point 1.5(2)).

1.5.3. Access to repair and maintenance information

The working documents include a detailed set of requirement regarding the access to repair and maintenance information.

What do we suggest?

- For space and water heating appliances, manufacturers should be allowed to do repair and maintenance.
- Professional repairers need to be qualified according to national rules. As such, we suggest the following wording as one of the possible acceptance criteria for the registration of the professional repairer (Ecodesign space heaters, Annex II, point 5(3)(a)(i); Ecodesign water heaters, Annex II, point 1.5(3)(a)(i)):

  'the professional repairer has the technical competence and the necessary qualification or training to repair hydronic central heating appliances and complies with the applicable regulations for repairers of the hydronic central heating appliances in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;'

- It should be made clear that the list of acceptance criteria is non-exhaustive, the manufacturer should be able to add requirements if deemed appropriate.
- At least 10 working days should be foreseen for the acceptance or refusal of the professional repairer and at least 5 working days should be foreseen for the access to the information. This is to ensure that manufacturers that do not have fully automated registration systems have sufficient time to deal with the requests. (Ecodesign space heaters, Annex II, point 5(3)(b); Ecodesign water heaters, Annex II, point 1.5(3)(b))

[11] In Germany, a new legislation on products that are in direct contact with drinking water has led to the destruction of millions of spare parts; also new EU restrictions, e.g. in REACH or RoHS, could potentially lead to the same.

- We request to replace point (e) of Ecodesign space heaters, Annex II, point 5(3); Ecodesign water heaters, Annex II, point 1.5(3) with:

  'The heater repair and maintenance information referred to in (a) should be defined according to the as appropriate by transitional methods';

  The transitional methods in turn should refer to standard EN 45553. This is because there is a standard that defines the relevant information for the repair and maintenance.

- There should be a provision in the regulation that replaces the information requirement to the repairer by a training (Ecodesign space heaters, Annex II, point 5(3); Ecodesign water heaters, Annex II, point 1.5(3)), e.g. as follows:

  'Alternatively to giving or to complement the professional repairer access to repair and maintenance information, the manufacturers of heating appliances may give an appropriate training.'

  This is because the heating industry often foresees trainings for professional repairers rather than a detailed list of maintenance and repair information.

1.6. Package label

We value the efforts that have been made to simplify and improve the package label. We do not however, understand the proposal completely.

At the meeting we understood the following:

- the supplier can make any package and has to label the packaged product with a package label:
  - if the components of the package are not placed on the market separately, only the package needs to be labelled, not the individual components.
  - if the components of the package are also placed on the market separately, the individual components as well as the package need to be labelled.
- the dealer can make only a package of a water heater and a solar device or a drain water heat recovery device. In this case the supplier has to label the components and the dealer has to label the package.

If this is the case, we welcome the principle.

What do we suggest?

- Amend Article 4 of Energy labelling space heaters and Energy labelling water heaters by differentiating between packages offered by suppliers and packages offered by the dealer.
- Clarify what label needs to be used in case of a package of space heaters, the label in point 4 of Annex III of Energy labelling space heaters s not suitable for all packages
- Clarify what to do in case of solar assisted space heating
- Clarify what to do in case a temperature control is not placed on the market together with the space heater
- Clarify how and where packages of space heaters with controls are defined
- Improve the text to avoid other ambiguities (Energy labelling space heaters and Energy labelling water heaters).
- Ensure that there is a clear difference between a simple product label and a package label.

Detailed reasoning

Unclarities

Article 4 is not clear, on the one hand the dealer has obligations when the product is a package, on the other hand there is no provision for the dealer to make such a package label.

In addition, Article 4 refers to point 4 in Annex III as the package label, however, if the package does not include a heat pump, the different climate zones on the energy label are irrelevant. Couldn't any of the labels be the package label depending on what the package is made of? For example, in case of a cogeneration appliance with a supplementary heater and a control, the label in point 1 of Annex III could be applied.

Some additional items remain unclear and also need to be clarified:

- It is unclear in the energy label in Section 4 of Annex III how a package of space heaters should be shown, would it be by introducing arrows for each heat source used, e.g. for the combination of a gas condensing boiler and a cogeneration unit you would need to fill in the grey bar on the bottom left and the flame?
- Is the energy efficiency class in case of a package the combined energy efficiency of all elements of the package? And why is the approach and icon different for water heaters than for heaters?
- Is the only indication to show that the product is solar assisted the black arrow underneath the sun in label 4? And how can solar assisted space heating be shown? And in label 5, what is the green, red and blue colour code on the left of the bar with the solar kWh/a?

2. Heater specific recommendations

2.1. Minimum energy efficiency requirements

2.1.1. Requirements for seasonal space heating energy efficiency

We welcome the proposal to keep the F(1) equal to -3%, because today's efficiency test conditions for boilers and heat pumps reflect the average use by consumers.

What do we suggest?

- Set the requirements as indicated in the Table below (Ecodesign space heaters, Annex II point 1(a)), which are on the basis of our calculations, the minimum seasonal space heating energy efficiency requirements from Regulation (EU) No. 813/2013 corrected for the PEF of 2,1 (see detailed reasoning below).
- Do not ban pilot flames (Ecodesign space heaters Annex II, point 1(b)): These devices are still needed in some areas, especially for appliances connected to natural draught chimneys. For example at wintertime, without a pilot-flame, some appliances may cool down due to the outside temperature, which may cause a lack of starting draught an issue of emissions inside the building. At summertime, if the outside temperature is higher than inside, a backflow in the chimney might happen in the absence of a pilot-flame, leading to similar issues.
- Add a definition for a pilot flame: *'pilot flame' means a flame which burns continuously during non-operational burner mode. Flames using only during burner start-up or operation mode are no pilot flames.* This will ensure that flames for stabilizing the burner only during the burner operation mode, i.e. not functioning are not considered a pilot flame.
- Do not include a requirement for the contribution of the heat pump of a hybrid space heater (Ecodesign space heaters Annex II, point 1(c)): The contribution of the heat pump is adequately covered by the seasonal space heating energy efficiency requirement of 110 % for hybrids. As such, to avoid overregulation, and require manufacturers to declare an additional parameter without added benefits, we suggest to remove it. In addition, it is unclear how the seasonal heating energy output should be calculated, this is a parameter that is not defined in the working documents, nor in any other European legislation; if the Commission Services would include such a requirement it should be on the basis of the rated heat output rather than on this parameter.

Seasonal space heating energy efficiency requirements (based on F(1) = -3% and PEF = 2,1):

Space heating energy efficiency per type	parameter	Regulation 813/2013	Working documents	EHI proposal
B1 Fuel boiler ≤10 kW & Fuel combi boiler ≤30 kW	η_s (%)	75	77	76
Fuel boiler ≤ 70 kW	η_s (%)	86	88	87
Fuel boiler > 70 kW ≤ 400 kW[a]	η_4 (%)	86	88 (on the basis of η_s)	86[b]
	η_1 (%)	94		94[b]
Electric (combi) boiler	η_s (%)	36	43	43
Cogeneration space heaters	η_s (%)	100	100	100
Electric heat pump, MT (Medium Temperature)	η_s (%)	110	130	130
Thermally Driven (TD) heat pump, MT	η_s (%)	110	115	110
Electric heat pump, LT (Low Temperature)	η_s (%)	125	155	150
Thermally Driven (TD) heat pump, LT	η_s (%)	125	Not included	110
Hybrid electric heat pump & fuel boiler, MT	η_s (%)	-	110	110
Hybrid TD heat pump & fuel boiler, MT	η_s (%)	-	Not included	-

[a] The scope should be limited to 400 kW, as is the case today (see Section 1.5 of this paper)
[b] On the basis of η_4 and η_1

Detailed reasoning

PEF correction for fuel based heaters

During the consultation forum meeting VHK justified the increased energy efficiency requirement by a reduced F2 value due to the PEF correction, calculations carried out show that the decrease in this factor varies from 0.5 to 1% maximum. As such an 2% increase is not justified from that perspective. Moreover, not all products use sufficient electricity to justify a correction at all.

B1 boilers

The energy efficiency requirement in combination with the modulation requirement (see also section 2.3) would mean a ban for B1 boilers. The electricity use of B1 boilers is insufficient to justify a PEF correction. If the intention is to keep the exemption, because it is deemed necessary in certain circumstances, the requirement should be kept as is. Requiring a redesign for these boilers that are phasing out of the market is economically not an option. In addition, there is a safety related problem with an η_s at 77%: the more efficient the appliance, the lower the temperature of the flue gas; for natural draught systems such as the B1 boiler, this could lead to an insufficient evacuation of the flue gases. Boilers > 70 kW

The η_s does not make sense for these products. Here, building automation plays a more important role in improving energy efficiency. As such, the corrections Σ F(i) for the controls that are proposed in the working document are not relevant. The controls of these products should be treated under the ongoing work for building automation controls. Moreover, test laboratories do not have the means to measure the losses, that are needed to calculate the η_s.

In addition, the amount of electricity used is not sufficient to justify a PEF correction (see also Follow-up of the review studies for Ecodesign and Labelling regulations for space and water heaters: EHI replies to the questions of the Discussion Document – 1st meeting of Working Group 2 "Testing" – 2 April 2020 of 6 May 2020).

Low temperature electric heat pumps

The proposed seasonal energy efficiency requirements for electric heat pumps goes beyond a simple PEF correction. These very efficient heat pumps should not be penalised. Increasing the requirements to 155% for these heat pumps will make these already expensive but valuable products for the road to 2050 even more expensive.

Thermally driven heat pumps

The electricity use of thermally driven heat pumps is insufficient to justify a PEF correction. For electric heat pumps the only increase in values is due to the PEF correction, there is no reason to treat these heat pumps differently. Increasing the requirements to 115% for these heat pumps will make these already expensive but valuable products for the road to 2050 even more expensive.

It is also important to point out that the VHK explanations provided to justify the value of 115% are wrong: the correction factor VHK applied in the calculation is 2,0 → 110*(100+4*2.5)/(100+4*2,0)= 112,03;

But the right one is 2,1; if adopted in the calculation: 110*(100+4*2.5)/(100+4*2,1)= 111,62

Furthermore, a 4% electrical consumption of the thermal output is not supported by any evidence; 4% seems to be the maximum consumption and not the average el. consumption that can be estimated around 2%

With a more realistic 2%, the final outcome is: 110*(100+2*2.5)/(100+2*2.1)= 110.84.

2.1.2. Requirements for water heating energy efficiency

EHI supports the introduction of separate Ecodesign limits for water heating efficiency per product type.

What do we suggest?

Set the water heating energy efficiency requirements (Ecodesign space heaters, Annex II, point 2) as indicated in the table below (see detailed reasoning below): These requirements are determined on the basis of the current market conditions and how appliances are installed and used in the building stock.

Water heating energy efficiency (based on the calculation method in current regulation and a PEF = 2,1, not including the effect of the passive flue heat recovery device):

Water heater type		3XS - S	M	L	XL	2XL	3XL	4XL
All	Regulation 813/2013	32	36	37	38	60	64	64
Electric combination boiler	Working documents	38	43	44	44	45	N.A.	N.A.
	EHI proposal	-	-	-	-	-	-	-
Fuel storage combination boiler and hybrid	Working documents	50	65	70	80	88	88	88
	EHI proposal	45	55 gas 36 liquid	60 gas 44 liquid	65 gas 50 liquid	70 gas 60 liquid	76 gas 68 liquid	76 gas 68 liquid

Water heater type		3XS - S	M	L	XL	2XL	3XL	4XL
Fuel instantaneous combination boiler and hybrid	Working documents	50	65	70	80	88	88	88
	EHI proposal	**60**	**65**	**75**	**75**	**75**	**80**	**80**
Electric heat pump combination heater	Working documents	60	80	90	90	115	130	130
	EHI proposal	**50**	**80**	**90**	**100**	**115**	**115**	**115**
TD heat pump combination heater	Working documents	55	66	77	88	95	100	100
	EHI proposal	**55**	**66**	**70**	**72**	**82**	**92**	**92**
B1 fuel combination boiler	Working documents	55	60	65	70	75	80	80
	EHI proposal	**45**	**55**	**65**	**60**	**65**	**70**	**70**
cogeneration	Working documents	45	56	68	78	100	105	105
	EHI proposal	-	-	-	-	-	-	-

Detailed reasoning

Combination boilers and hybrids

For combination boilers and hybrids, we suggest

- A clear differentiation between:
  - Fuel storage combi and fuel instant combination heaters
  - Gas and liquid fuel fired for storage combination heaters
- And relevant requirements in order not to drive the market of heating boilers combined with a storage tank rather than fuel storage combination boiler.

As an example to illustrate, the min-value of fuel storage combi heater with XXL tapping profile in the working documents shows 88% – the best available technology indicated in the benchmark-table a value of 90%, that is only 2 points less, this is unacceptable.

Electric and thermally driven heat pumps

The requirements for thermally driven heat pumps are too high, especially in the high load profiles. Setting higher requirements will lead to higher purchase prices for these already expensive products.

2.2. Requirements related to monitoring

We consider the mandatory reporting and storage of all the operating parameters of the heater listed under Annex II, point 7 as well as other weather data and temperatures in the building not to be expedient. The amount of data would confuse the consumer more than provide him with useful information. Furthermore, a computer or a cloud would be needed to handle the huge amount of data.

What do we suggest?

- During this review, we suggest to refrain from mandatory ecodesign requirements for monitoring: the requirements are complete new and were never discussed in the extensive preparatory phase, they are not based on a feasibility study, currently there are no measurement standards, and hence no possibility to determine the accuracy of the data ((Ecodesign space heaters, Annex II, point 7).
- Introduce the "efficiency/consumption display" on a voluntary basis first: to gain experience, introduce improvements and set up standards. This would avoid a systematic increase of the purchase price of the appliance and allow the European Commission to decide in next review whether to introduce a mandatory requirement. This will also allow EC and/or market surveillance authorities to prepare necessary infrastructure and data-checking processes without the danger of mistakes and misleading interpretations.
- To support the voluntary market introduction, real life monitoring should be incentivised by at least introducing an icon and considering a bonus on the energy label for the use of monitoring facilities including a connectivity function (Energy labelling space heaters, Annex III; Energy labelling water heaters, Annex III): the specifications for these should be simple and open in detail. As an example, the specification of the German Federal Subsidy Scheme for Efficient Buildings (BEG EM), which provide for the recording of the amounts of heat generated and the amounts of energy required, could be used. The manufacturer should be free to decide whether to use heat meters or to carry out internal balancing. However, precision requirements should not be specified.
- During the next review, evaluate the mandatory ecodesign requirements for monitoring, taking into account the experience gained in the voluntary introduction of the requirement and the application of the bonus (Ecodesign space heaters, Article 8; Ecodesign water heaters, Article 8).
- Organise a technical meeting to further discuss the monitoring requirements.

We also cannot support the provision of data to the Commission at the present time ((Ecodesign space heaters, Annex II, point 7(5) to (7)). Consumption and efficiency data are significantly influenced by user behaviour and the overall building system, in addition to appliance characteristics. The data of individual heating devices can therefore represent a wide range and thus do not offer any meaningfulness. On the contrary, the lack of significant influencing parameters leads to significant confusion. Here, too, the experience gained should be used in the coming revision.

2.3. Scope extension to 1 MW

2.3.1. All product families

The extension of Ecodesign to this product range does not seem appropriate, as heaters above 400 kW and up to 1,000 kW are large, tailor-made products, i.e. manufactured in small batch series.

For these products, monitoring on site is best suited, as is the case for products above 1 MW in the Medium Combustion Plant Directive (MCPD). However, ecodesign is about the placing on the market, as such products in the scope need to be tested before they are placed on the market. This means that they should be tested in a laboratory environment, however, there are only a very limited number of test laboratories available in the EU for such large appliances.

This would become additionally difficult if third party conformity assessment is imposed. In this case, there would be unacceptable delays in the placing on the market of these products.

In addition, even if sufficient test labs would be available, there are still a number of important issues to solve:

- How to manage testing?
- How to carry space heaters in laboratory?
- How to deal with repeatability?
- How to weigh the critical mass of liquid fuel with high accuracy?
- How to manage with market surveillance for such tailor-made and expensive products?

This does not only apply to the products in the scope of these regulations, but also solid fuel boilers.

What do we suggest?

- To limit the scope of the ecodesign regulation for space and water heaters to 400 kW (Ecodesign space heaters, Article 1) (See detailed reasoning below).
- However, if the European Commission decides to continue with the extension of the scope to 400 kW, for boilers, as a minimum, the following would be needed:
  - Exemptions for the following products:
    - Heaters in the scope of the Pressure Equipment Directive, meaning products designed to deliver hot water above 110 °C, i.e. adding a new exemption in Article 1.2 of Ecodesign space heaters:

      'space heaters designed to deliver hot water above 110 °C'

    - Boilers that do not have an integrated burner (heater housing), i.e. by adding a new exemption in Article 1.2 of Ecodesign space heaters:

      'heat generators designed for heaters and heater housings with a rated heat output > 400 kW to be equipped with such heat generators placed on the market before 1 January 2029 to replace identical heat generators and identical heater housings. The replacement product or its packaging shall clearly indicate the heater for which it is intended.'

  - In addition, Article 1.2 of Ecodesign space heaters should include the following exemptions:

    'burners designed for heaters with a rated heat output ≤ 400 kW and placed on the market before [1 January 2018 + minimum period for making available necessary spare parts under Ecodesign] ~~to~~ as replacement for identical burners designed for heaters, which were placed on the market and/or put into service before 1 January 2018. The replacement product or its packaging shall clearly indicate the heater for which the burner ~~it~~ is intended and the burner intended to be replaced.'

    'burners designed for water heaters with a rated heat output ≤ 400 kW placed on the market before [1 January 2018 + minimum period for making available necessary spare parts under Ecodesign] ~~to~~ as replacement for identical burners designed for water heaters, which were placed on the market and/or put into service before 1 January 2018. The replacement product or its packaging shall clearly indicate the water heater for which the burner ~~it~~ is intended and the burner intended to be replaced.'

Detailed reasoning

Boiler space heaters larger than 400 kW

Although there are products on the market that can meet the energy efficiency and NOx requirements for boiler space heaters, it should be noted that if the requirements for boiler space heaters below 400 kW are extended to those above 400 kW, an estimated 50 %[12] of the models on the market today would no longer be allowed to be placed on the market. For products with a lifetime of about 20 years that have a much lower sales number than products below 400 kW[13] and that were never subject to energy efficiency requirements on an EU level, this would have a huge financial impact.

In addition, the market for these boilers is different than for boilers below 400 kW and in some cases, renovating the non-condensing boiler and burner with a more efficient alternative will face specific constraints. Some examples

[12] Based on an analysis of the French ATITA database, see Annex

[13] The review study did not include sales and stock data for products > 400 kW, however, for example, the for the French market less than 1,5 kU

are high temperature boilers (boilers covered by the Pressure Equipment Directive, i.e. intended to heat water at temperatures above 110 °C), applications where the heating is a critical requirement (hospitals, botanical collections etc.) and dual fuel applications and some smaller industrial processes. As such, if the range above 400 kW has to switch to condensing boilers, a large part of these boilers might never work in condensing mode.

Furthermore, boilers in the thermal power range above 400 kW are often a combination of a boiler and a burner. Due to different and sometimes overlapping capacities in this high output range, the combinations of boilers and burners are many, so that testing all combinations will be practically impossible and due to the low sales number for each combination, very expensive. Calculating the energy efficiency on the basis of tests on similar appliances might solve this partially, however, it should be noted that the impact on the market for these boilers without integrated burners would be larger than the estimated 50 % in the first paragraph, especially for liquid fuel boilers.

Finally, there are very few independent laboratories (less than 5 in the EU) able to test such big capacity boilers in a certified environment and even if sufficient time is given to adapt the laboratories, the increased heat discharge and the need to provide water flow at constant temperature for reliable efficiency test could remain an issue. This issue becomes more prevalent for boilers closer to 1 MW.

In the case that both parameters P4 and P1 are required to be measured, the size of the above described problems double.

Electric heat pumps larger than 400 kW

We welcome the exemption for reversible heat pumps with a rated capacity larger than 400 kW (Ecodesign, Art 1 point 2(j).

For the heating only heat pumps, the general principles, as described in the first section apply.

Thermally driven heat pumps larger than 400 kW

There are few players on a worldwide basis who produce thermally driven heat pumps above 400 kW. Currently no European test standard are available for these large appliances.

In addition, thermally driven heat pumps above 70 kW are usually modular, i.e. a combination of heat pumps smaller than or equal to 70 kW. The individual heat pumps that are used in such a combinations are already covered by the ecodesign regulation. By extending the scope to thermally driven heat pumps above 400 kW, manufacturers will have to test combinations of heat pumps in addition to the individual heat pumps. This will not lead to additional energy and emission savings, as such the burden outweighs the benefits for this product category.

2.3.2. Verification tolerances

We welcome the tolerances (Ecodesign for space heater, Annex IV, Table 9, Energy labelling for space heaters, Annex IX, Table 11) or the seasonal space heating energy efficiency of cogeneration and heat pump space heaters, the water-heating efficiency, the sound power level and the emissions for nitrogen oxides.

We do however have some concerns about the tolerance of 4 % for the seasonal space heating energy efficiency of fuel boilers. We agree that the current 8% tolerance to verify the seasonal space heating energy efficiency of boilers could be reduced, provided today's test procedures are used. The assessment made by VHK and the proposal of 4 % relies on results from the ECOtest project, however, this project only tested on a limited number of boilers. Any proposal for a new tolerance on the seasonal space heating energy efficiency of boilers should rely on measurements carried out on several appliances.

In addition, since there are no measurement standards and no tests results for real-world energy consumption and real-world heat delivered, tolerances cannot be determined at this stage (see also the section on monitoring).

What do we suggest?

- Based on further evaluation of their product ranges, the tolerance for fuel boilers should be increased to 5 % (Ecodesign space heaters, Annex IV, Table 9; Energy labelling space heaters, Annex IX, Table 11).
- Remove the tolerances for real-world energy consumption and real-world heat delivered from Table 9, Annex IV to the Ecodesign space heaters (See section 2.5 of this paper).

2.4. Temperature controls

We welcome that the working documents are including an F(1) of -3% (Ecodesign space heaters, Annex I, point 24; Energy label space heaters, Annex I, point 25). The proposal made by VHK to reduce the value to -8% would require manufacturers to recalculate all their energy efficiency values without added energy savings, this would not be justified from an administrative cost point of view.

Furthermore, the temperature control classes do not reflect the progress anymore that has been made in the field of temperature controls. The new proposal adds new features to update the controls' role in packages to reflect them. It has to be noted that only control features are considered that are used to influence the heat demand signal.

These new features include:

- heating schedule;
- weather forecast;
- presence detection;
- remote control;
- geofencing.

Since the new features may be selectively included in a control, it% is not possible to expand the list of classes because of the amount of feature combinations. It is therefore proposed to cover the new features in increments added to the F(1) factor as set out in Section 5.

What do we suggest?

- We welcome the values for temperature control classes II, IIII, IV, V and VIII (Energy labelling space heaters, Annex VIII, Point 8).
- We suggest the following values for control classes I, VI and VII (Energy labelling space heaters, Annex VIII, Point 8):

Class No.		TC (%)
I	On/off room thermostat	0.5%
VI	Weather compensator and room sensor, for use with modulating heaters	4%
VII	Weather compensator and room sensor, for use with on/off output heaters	3.5%

- We suggest to add values for the following innovative features of temperature controls (Energy labelling space heaters, Annex VIII, Point 8):

Description		TC (%)
Time scheduling	Heating schedule	0.5 %
	Heating schedule with heat up optimisation	1.0 %
Presence detection in each relevant room		0.5%
Remote control		0.5%
Weather forecast		0.5%
Geofencing		0.5%

2.5. Requirements related to emissions

We welcome:

- the proposed value in Ecodesign space heaters, Annex II, Point 4(a) for NOx emissions.
- the proposal to give different correction factors to the NOx emission limits for G30 (butane) and G31 (propane) respectively (Ecodesign wate heaters, Point 1.3 (a)). This is indeed in line with the most recent proposal of experts in the relevant EN 15502-1 standard.

What do we suggest?

- We are not in favour of the proposed requirements related to modulation (Ecodesign space heaters, Annex II, point 4(d) and (e)), see Section 2.9.1 of this paper on the test regimes for fuel boilers.
- We welcome the introduction requirements related to 20 % hydrogen, biomethane and liquid biofuel (Ecodesign space heaters, Annex II, point 4(f) to (h)), however we propose a slightly different scope, see Section 2.1 of this paper.
- Concerning liquid fuels we see that specific Nref values are missing in Table 6 in Annex IIIa to Ecodesign water heaters. This modification paves the way to products with higher NOx emissions and it would be a step back in comparison to the current requirements. We request to reintroduce the Nref as is the case in the current transitional method, i.e. Commission Communication 2014/C 207/02, par. 3.

2.6. Heat pumps

2.6.1. Compensation method

We understand that the compensation method could address concerns of market surveillance authorities and, depending on the case, may deliver results that are closer to the performance of the appliance in use conditions. However, currently there is not sufficient evidence to conclude whether the method is accurate, reliable and reproducible. As such, the method is not mature enough at this point to be implemented in this revision of the ecodesign and energy labelling regulations for space heaters.

What do we suggest?

- Do not introduce the compensation method on a mandatory or voluntary basis (Ecodesign Annex III, Point 6) at this stage: Currently there is not sufficient evidence to conclude whether the method is accurate, reliable and reproducible. As such, the method is not mature enough at this point to be implemented in this revision of the ecodesign and energy labelling regulations for space heaters.

- Keep on working on the development of an alternative testing method, with a precise assessment of the test time, the accuracy, the repeatability and the reproducibility of the method.
- Organise technical meetings with interested members of the Consultation Forum to discuss the progress on the development of this alternative testing method when new evidence is available. This new evidence, such as the final results of the Round Robin Test, should be shared with all relevant stakeholders prior to the meetings to ensure that a proper assessment by the participants can be made as a preparation for the meeting.
- Introduce a review clause in the regulation to assess the appropriateness of introducing the compensation method in the next review.
- Should the method be introduced in this review:
  - Re-evaluate the energy efficiency requirements on the basis of the compensation method
  - Consider a transition time for the retesting of all heat pumps of at least two years.

Detailed reasoning

Industry and test houses have been participating in round robin testing coordinated by BAM. The results of the tests show that there are still problems under certain test conditions (e.g. the A12 point).

Another important factor that needs to be considered when evaluating the compensation method is the time needed for testing. More test time means higher costs and a lower capacity for testing, some of our members who participate to the round robin test indicate that this could be four to five times longer.

Finally, the effect on the energy efficiency should also be thoroughly investigated. The ecodesign limits and energy efficiency classes in the proposal are based on the current measurement and calculation methods and not on the compensation method.

Before any decision can be made, a detailed report evaluating all of the above is needed. As such, the suggestion that was made by some Member States during the Consultation Forum to decide this during the regulatory vote, would not work.

Apart from the above, all heat pumps in the scope of the regulations for space heaters would have to be retested according to the compensation method. For these complex products, this would be problematic because of the higher testing time according to this method.

Finally, during the Consultation Forum meeting, the Commission Services explained that it was the intention to introduce the compensation method on a voluntary basis. This was not clear on the basis of the current text. It seemed that the compensation method was to be used by market surveillance authorities, but not necessarily by manufacturers. If market surveillance authorities can choose which methods to use for surveillance checks, in reality for manufacturers this would mean that they would have to test their units according to both methods, since the outcome of both methods is not the same.

2.6.2. Temperature regime

2.6.2.1. Air-to-water heat pumps

The working document removes the fixed outlet test conditions for heat pumps and a capping of the exhaust ventilation air to Pdesign/0.01 m^3/h.

We understand that the idea behind this proposal is not to extract heat by an exhaust air heat pump and that the mathematical base is the equation for Energy flow rate converted to the ratio of energy flow rate to volumetric flow rate.

This implies, that the area to be supplied with heat is the area where the extract air comes from. This is not always the case. An exhaust air heat pump can also be used for heat extraction only and move the energy to anywhere else. The application should be treated by the Energy Performance of Buildings Directive and by adequate planning. Therefore, no reason can be found to set ecodesign requirements on specific volumetric low rates.

The flow rate on the evaporator side is declared with the fiche and this is sufficient for planning.

What do we suggest?

- Introduce a voluntary declaration of HT test regimes for heat pumps in the product information sheet rather than a mandatory one: this would be sufficient to ensure a harmonised framework to declare data for HT heat pumps (Ecodesign space heaters, Annex III and Annex II, Table 1, Energy labelling space heaters, Annex VIII and Annex V, Table 1).
- Keep the fixed outlet test conditions for heat pumps in line with the EN 14825: There is no reason for removing the fixed outlet conditions for heat pumps. Fixed and/or variable speed heat pumps (related to speed of the compressor) can both have either a fixed or a variable speed pump leading to fixed or variable water flow. And depending on the control of the unit, the outlet temperature is either variable or fixed, meaning that the unit can either automatically vary the outlet temperature based on outdoor temperature or not (Ecodesign space heaters, Annex III, Table 4; Energy labelling space heaters, Annex VIII, Table 6).
- Capping of the ventilation exhaust air (Ecodesign space heaters, Annex III, Tables 2 and 6; Energy labelling space heaters, Annex VIII, Tables 4 and 8): If our understanding is wrong, we ask for a clarification. What are the benefits of proposing such a requirement? If our understanding is right, we ask for deleting this requirement. Brine-to-water heat pumps

The working documents introduces new outlet temperatures for brine to water heat pumps.

For brine-to-water heat pumps, it would be too premature to change the outlet temperatures for brine to water heat pumps.

What do we suggest?

Not to change the outlet temperatures for brine to water heat pumps (Ecodesign space heaters, Annex III, Table 4; Energy labelling space heaters, Annex VIII, Table 6).

Detailed reasoning

The proposal to use 5°C for average climate and 10°C for warmer, for the moment, based on field data from only one manufacturer, is not sufficient evidence to change the temperature regime and require the industry to retest all their appliances. Supporting studies such as “ISE Feldtest” need to be interpreted carefully.

An analysis by the CEN TC113/W7, the relevant standardization working group, to take into account the following has led to the conclusion that the temperature regime should not change:

- the impact of climate on brine outlet temperature and all influencing factors such as geology, hydrology, type of heat source (bore hole, flat collector, …) and dimensioning regarding temperature and cost
- the need to revise reference temperatures of the other ground sources (ground water at +10°C, direct evaporation at +4°C) to ensure a level playing field.

In addition, the impact on the products has not been quantified. What is the increase in least life cycle cost? What it the gain in energy efficiency?

2.6.1. Sound power

2.6.1.1. Testing method

We welcome the changes that have been introduced in Annex III, point 6 to the working document for the ecodesign for space heaters and Annex VIII, point 12 to the working document for the energy labelling regulation for space heaters. This new method will allow the use of the generic test methods in the EN 12102-1 and will not require modifications to the test facilities. Still, the values reported by this method can be considered representative of the noise over the heating season.

We do however, suggest a small improvement of the wording in the first sentence following the table, to avoid that this could be misinterpreted as referring to the part load (Ecodesign space heaters, Annex III, Point 6; Energy labelling space heaters, Annex VIII, Point 12):

'If the aforementioned heater cannot operate with the applicable settings, in the given temperatures, the heater shall be tested with a lower outdoor air temperature than +7° C, but as close as possible to +7° C until the required settings can be achieved ~~of part load condition B apply~~.'

2.6.1.2. Information requirements

Market Surveillance Authorities should be able to obtain the information about the settings that were used during sound power testing.

What do we suggest?

The product information sheet (Ecodesign space heaters, Annex III point 6; Energy labelling space heaters, Annex V, point 2)should include the following:

'Upon request from Market Surveillance Authorities, manufacturers shall provide all settings used during sound power testing that affect the sound power (e.g. rpm fan and compressor, number of fans, number of compressors, number of stages) the maximum settings (e.g. max rpm fan and compressor).'

2.6.1.3. Maximum sound power level

The table with the sound power requirements in Annex II, Section 3 refers to the heat output at part load condition C to set the capacity limits for each sound requirement. This was changed in the presentation during the Consultation Forum meeting, but it was not introduced in the corrected working document for ecodesign for space heaters. In the current ecodesign regulations this was always set on the basis of the rated heat output. Since there is no reason for changing this practice, we request to keep the current practice and set the capacity limits on the basis of the rated heat output.

In addition, the table does not include an upper limit. Appliances above 70 kW are usually used in non-residential areas, requiring until 1 MW to meet the sound power requirements of those below 70 kW will not be feasible. As such we request to reinstall the upper capacity limit of 70 kW. During the Consultation Forum meeting, VHK said that this was a mistake, however it was not taken up in the corrected working document for the ecodesign for space heaters.

What do we suggest?

To modify the table in Ecodesign space heaters, Annex II, Section 3 as follows (the changes are shown in comparison to the text in the working documents, parts that are underlined are new additions):

Rated heat output at part load conditions C, as set out in Annex III, Table 4	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors
≤ 6 kW	60 dB	65 dB
> 6 kW and ≤ 12 kW	65 dB	70 dB
> 12 kW and ≤ 30 kW	70 dB	78 dB
> 30 kW and ≤70 kW	80 dB	88 dB

2.7. Fuel boilers

2.7.1. Test regime

The working document is unclear as to whether the HT test regimes need to be declared in a voluntary or mandatory way on the product information sheet for boilers.

In addition, the working document introduces a modulation requirement that gas-fired combination boilers with rated heat output ≤70 kW should be able to modulate their heat output down to 15% of the rated heat output without on/off cycling and at the same useful efficiency as at 30%. Oil-fired combination boilers ≤70 kW should be able to modulate their heat output down to 25% of the rated heat output without on/off cycling and at the same useful efficiency as at 30%.

In general, any proposal regarding oversizing should be based on facts and data, as is usually the case for ecodesign requirements. Until today, we have not seen any data on what this would mean in terms of energy savings, CO_2 emissions or methane emissions, on whether 15% for gas and 25% for oil would be the most suitable modulation nor on what this would mean in terms of cost.

EHI members are currently gathering data to this end and will come back to the Commission Services and VHK have the necessary proof.

What do we suggest?

- Remove the HT declaration for boilers, since the HT declaration does not give any added value, since the current test conditions for boilers reflect their average use by consumers.
- Remove the proposal to account for oversizing, since it is not justifiable for the following reasons (Ecodesign space heaters, Annex II, Point 4(d) and (e)):
  - Calculation results[14] show no decrease of the energy efficiency between 30% and 13% part load for condensing boilers and no impact from switching to on/off-mode between 30% and 13%;
  - Calculation results show that the maximum savings in methane emissions (calculated as CO_2equivalent) of 15% modulating gas burner compared to an existing 25% modulating gas burner does not exceed 0,9 % of the overall annual CO2-emission;
  - An appropriate dimensioning of technical building systems is a general requirement according Art. 8 of (EU) 2018/844 (Amending 2010/31/EU "EPBD") and includes of course also the sizing of heating boilers;

Detailed reasoning

Ecodesign sets requirements for the entire EU internal market. In the EU, there are different building structures with different heating requirements. The general statement of oversizing may of course apply in individual cases, but cannot be applied across the EU as a whole. The differences in the building standards also require a differentiation in the heat generation products. The proposal for modulation was not evaluated sufficiently in the supporting review studies, no assessment was made on the increase in purchase price of the appliance, the least life cycle cost and the benefits in terms of reduction of energy consumption and emissions.

Technical aspects must also be taken into account. Operation in very small loads can lead to icing of the flue gas path, for example, so all aspects must be considered before introducing such requirements. In the case of flue gas

14 With regard to the mentioned Gas-Combi-Boilers up to 24 kW: A German standard (DIN 4702 – 8; March 1990) included a methodology to calculate a standardized "annual efficiency", based on the measurements of 5 different heat load situations (63%; 48%; 39%; 30% and 13%) and – in case of condensing boilers – two temperature regimes (75°/60° and 40°/30°).

systems, this could result in the modulation limit having to be raised again, depending on the flue gas configuration. This would mean that the required modulation would no longer be applied.

Multiple flue chimney installations with condensing boilers become more and more popular in renovation. The flue gas system needs to work under overpressure conditions because of the limited space inside the existing chimney. In this installation the boilers face a positive pressure difference changing depending on the user behavior. In this installation the minimum load is the critical condition (see EN 15502-2-1). A high modulation range needs to be reduced in these cases to avoid problems in terms of reliable function and safety. A higher modulation range may slow down this kind of very energy efficient renovation.

In addition, there are many other aspects that have far more influence on the energy consumption than the gains in energy consumption from a modulation to 15%. As an example, the user behaviour of the consumer is a very important factor. A reduction of the room temperature by 1 Kelvin leads to an average annual primary energy saving of approximately 8 %. Accordingly, the temperature difference of 1.7 Kelvin results in an annual primary energy saving of approximately 14 %. Also, a German study shows that for a very demanding user behaviour, the primary energy demand is approximately 44 % higher than with the standard consumer; while with a very economical user behaviour, savings of approximately 28 % are possible compared to the standard user.

Finally, this requirement means a ban for B1 boilers and would drive the market to repair. The flue gas evacuation and air supply for this type of boilers are driven by the draught in a chimney due to warm flue gases. The difference in density of warm flue gas and the ambient air is the "motor" of the system. To keep the "motor" on a sufficient power level to drive the system the flue gas temperature shall not be lower as 130°C at full load and 90°C at minimum load. Otherwise, the "motor" becomes too weak to drive the heating system. As the consequence flue gas enters the room by the draught diverter.

2.7.2. Exemptions B1, C2, C4, C8 (Section 3.1.3 in the interim report)

2.7.2.1. Exemption B1

We welcome the lower minimum seasonal space heating energy efficiency requirements for type B1 fuel boilers with rated heat output ≤ 10 kW and type B1 fuel combi boilers with rated heat output ≤ 30 kW, in comparison to other fuel boilers. Indeed, efficient heating technologies to replace type B1 boilers exist, but buildings need to be renovated to allow the move to efficient alternatives; until then, the exception may be needed to avoid a negative impact on the weaker groups of society which cannot afford the renovation.

We do however, have serious concerns with the requirements for the seasonal space heating energy efficiency for B1 fuel boilers and combi boilers and the modulation requirement for B1 fuel boilers combi boilers, since these will ban the placing on the market of these products (see also Sections on minimum energy efficiency requirements and on modulation).

To avoid loopholes, we welcome that some information requirements have been included in the working documents, we do however believe that this could be strengthened.

What do we suggest?

- Keep the exemption for B1 boilers (Ecodesign space heaters, Annex II, Point 1(a)).
- Reduce the requirement for B1 boilers to 76 % and remove the modulation requirement to avoid an indirect ban of these appliances (Ecodesign space heaters, Annex II, Point 1(a)) (See Section 2.1.1 of this paper).
- We welcome the proposition to include a statement for B1 fuel boilers and combination boilers in the instruction manuals for installers and end-users, and free access website (Ecodesign space heaters, Annex II, Point 6(a)(5)). We do however, suggest a minor change to stress that B1 boilers can only be used in very limited cases:

  "This natural draught boiler is intended to be connected only to an existing multi inlet-chimney, ~~flue~~ shared between multiple dwellings in existing buildings, that evacuates the residues of combustion to the outside of

the room containing the boiler. It draws the combustion air directly from the room and incorporates a draught diverter. Due to lower efficiency, it is forbidden to connect this boiler to any other type of chimney or products of combustion evacuation system (either new or existing) any other use of this boiler shall be avoided and would result in higher energy consumption and higher operating costs.';

- We suggest to maintain the mandatory sticker 'type B1 boiler' or 'type B1 combination boiler' on the heater;
- We welcome the mandatory statement in the technical documents that the heater is a type B1 boiler (Ecodesign space heaters, Annex II, Point 6(b)(4)).

2.7.2.2. Extension the exemption to C2, C4 and C8 boilers

We welcome that the working documents do not include exemptions for C2, C4 and C8 boilers.

During the last 6 years C2, C4 and C8 boilers have been successfully replaced by energy efficient alternative solutions. As such, there is no need to extend the exemption to those appliances.

European manufacturers are no longer producing these boilers, as a result of the current ecodesign Regulation. As such, a reintroduction of these boilers on the EU market would have a big impact for EU manufacturers.

Finally, the boilers that were banned in 2015 will not be compliant with the NOx requirements and will need to be redesigned.

What do we suggest?

Not to include exemptions for C2, C4 and C8 boilers (Ecodesign space heaters, Annex II, point 1(a)).

2.8. Hybrids

Hybrids are key technologies to achieve carbon neutrality in buildings by 2050, starting with the 2030 targets. Hybrids have many advantages. Here are some examples:

- They can be affordably installed without any prior adaptation of the building envelope, where higher space heating feeding temperatures are required. This facilitates fast renewable uptake, acceleration of carbon emission reduction, and helps people for staged renovation on the road for a more ambitious Green Deal 2030 target and a carbon neutral building stock in 2050.
- They help to use both green electricity and green gases, by being able to switch between the two energy carriers. In doing so, hybrids can increase the penetration of renewables, alleviate stress on the electricity grid and reduce infrastructure costs. Thanks to their low consumption, they are good partners of green gases.
- Moreover, where dynamic prices are implemented, people may save on the electricity bill, shifting their consumption to times when demand (and prices) are low.

Hence, it is important that ecodesign and energy labelling provide an adequate framework for this technology, along the following lines:

- Hybrids have to be energy efficient, with minimum requirements on the unit and on the combustion heat generator, to prevent banned technologies to re-enter the market.
- Hybrids have to be flexible and future-proof: different national strategies for decarbonization, as well as different characteristics of energy carriers and networks, require different characteristics of hybrids.
- We are currently further evaluating the proposals in the working documents for hybrids, but would already like to make the following preliminary considerations:

As such, we welcome

- The consideration of hybrids in their own right and the level of the minimum energy efficiency requirement at 110 % under the condition that testing and calculation follows prEN 14825:2021.

- The choice between the combined and the separate method. The test labs that are capable of testing heat pumps and gas boilers are limited. As such, by limiting the method to the combined method testing method, the number of test labs capable of testing hybrid units will be reduced and as a consequence the price of testing will increase. In many cases the boiler and the heat pump of the hybrid unit are manufactured by two different manufacturers and sold by one manufacturer. As such, by limiting the method to the combined testing method, the manufacturer which sells the appliance has the obligation to test, while he is not necessarily capable of testing the heat pump and gas boiler at his facilities. By allowing the separate method, no loopholes are introduced, as the separate method is designed to produce less favourable values than the combined method.
- That the water heating energy efficiency of hybrid combination heaters are the same as those for fuel combination boilers, however we believe a differentiation should be made between boilers with or without a storage tank.

That the sound power level of hybrid heaters are the same as those for heat pump heaters.

What do we suggest?

- Do not include a requirement for the contribution of the heat pump of 25 % for a hybrid space heater (Ecodesign space heaters Annex II, point 1(c)) (see Section 2.1.1 of this paper)
- Not to use the compensation method, since not sufficient evidence is available to prove that it is a reliable, accurate and reproducible method (see Section 2.2.1 of this paper)
- Set the water heating energy efficiency of hybrid water heaters at the same level of those for fuel instantaneous and fuel storage water heaters (Ecodesign water heaters, Annex II, Point 1.1).
- We welcome the proposal for the package label to only allow a supplier to label a combination of a heat pump and a boiler as a package (See Section 1.6 of this paper).
- Replace the definition of 'hybrid heater' (Ecodesign space heaters, Article 2 (15); Energy labelling space heaters, Article 2(16)) by:

  'hybrid heater' ~~means an encased assembly or assemblies designed as a unit consisting of an electric heat pump and a fuel boiler as heat generators~~ means a heater that generates heat using the combustion of fuels and the vapour compression or sorption cycle for the use of ambient heat from an air source, water source or ground source, and/or waste heat ~~as well as a~~ managed by a hybrid master controller providing an optimised operation of the unit heat generators for space heating.

- Replace the definition of 'heat pump heater' (Ecodesign space heaters, Art 2, point (12), Energy labelling space heaters, Art 2 point (14)) by:

  'heat pump heater' means a space heater using the vapour compression or sorption cycle for the use of ambient heat from an air source, water source or ground source, ~~solar irradiance,~~ and/or waste heat for heat generation; a heat pump space heater may be equipped with one or more supplementary heaters using the Joule effect in electric resistance heating elements.

  The wording thermodynamic cycle is too broad and could include more than only vapour compression and sorption.

- Replace the definition of 'rated heat output of a hybrid heater'' (Ecodesign space heaters, Annex I, point (40), Energy labelling space heaters, Annex I, point (41)) by:

  'rated heat output of a hybrid heater' means ~~the sum of $P_{rated,hp}$ for the heat pump part of the hybrid heater and, as appropriate.~~ the declared heat output of the hybrid heater at the design temperature', in kW;

  The definition in the working documents does not take into account the logic of the hybrid heaters.

- Add a definition for the 'hybrid master control' (Ecodesign space heaters, Article 2 or Annex I; Energy labelling space heaters, Article 2 or Annex I), i.e.:

'hybrid master control' means a control for hybrid space heaters and hybrid combination heaters managing the operation of the different heat generation parts. This control is an integral part of the hybrid space heater and hybrid combination heater.

- Introduce the following ecodesign requirement for the boiler part of the hybrid heater (Ecodesign space heaters, Annex II, Point 1(a)) (see detailed reasoning):

  'The part of the space heater that generates heat using the combustion of fuels boiler space shall comply with the ecodesign requirements for boiler space heaters or boiler combination heater.'

  This is to avoid a regulatory loophole for inefficient appliances (see detailed reasoning below). A requirement for the emissions of nitrogen oxides for hybrid heaters at the same level of that for boilers, split up between liquid fuels or gaseous fuels.

- The promotion of smart grid hybrid capability in the assessment of the product (Energy labelling space heaters, Annex III).
- Introduce a voluntary icon on the energy label for products that are 'hybrid-ready' to facilitate interoperability of boilers and heat pumps from the same supplier placed on the market separately, for combination into a hybrid (Energy labelling space heaters, Annex III). In that respect, the following two definitions should be added:

  'hybrid ready boiler" means a boiler that has, or can be, equipped with the capability to receive and process a signal for activation and deactivation of boiler operation.

  'hybrid ready heat pump' means a heat pump that is, or can be, equipped with the capability to transmit a signal to activate/deactivate a hybrid ready boiler and the capability to enable the end-user to adjust the setting of the bivalent temperature.

- Remove the contribution of the heat pump in the hybrid heater (Ecodesign space heaters Annex II, point 1(c)) (See Section 2.1.1 of this paper).
- Add the details of the transitional method for hybrid heaters (Ecodesign space heaters, Annex IIIa; Energy labelling space heaters Annex VIIIa): this is currently missing in the documents.

Detailed reasoning

Combination of a non-condensing boiler and a small heat pump as 'niche boiler'

A combination of a non-condensing boilers with a heat pump (defined as a hybrid or niche boiler) would open up the market for non-condensing boilers, which manufacturers are phasing out. Rather than to keep on promoting non-condensing boilers, chimney renovation should be recommended to avoid a lock in effect.

If this product is tested as a boiler, this will lead to an overestimation of the results, since the current standard for gas boilers does not cover the integration of electric HP (or other energy source) in the boiler; this should be avoided.

In addition, the small heat pump contributes to warm the water before its return in the combustion chamber of the boiler, reducing the difference between the flow temperature and the return temperature (ΔT) in the boiler. This reduction leads exhaust fumes to condensate in the flue ducts and/or inside the combustion chamber. Due to the issues (e.g. damage to the boiler, corrosion of the flue ducts, safety risks due to remaining condensate) arising from the condensate in the flue ducts and or combustion chamber of the non-condensing boiler, the installer might decide to switch off the heat pump. This will be detrimental for the energy efficiency of the heating system.

3. Water heater and hot water storage tank specific recommendations

3.1. Water heating energy efficiency requirements for water heaters

EHI supports the introduction of separate Ecodesign limits for water heating efficiency per product type.

What do we suggest?

- Set the water heating energy efficiency requirements (Ecodesign water heaters, Annex II, point 1(a)) as indicated in the table below requirements (see detailed reasoning).
- Do not ban pilot-flame devices (Ecodesign water heaters, Annex II, point 1(a)): the proposed Ecodesign efficiency limits would effectively (minimum values for the water heating energy efficiency) ban pilot flame appliances. But these devices are still needed in some areas, especially for appliances connected to natural draught chimneys. For example in wintertime, without a pilot-flame, some appliances may cool down due to the outside temperature, which may cause a lack of starting draught an issue of emissions inside the building. In summertime, if the outside temperature is higher than inside, a backflow in the chimney might happen in the absence of a pilot-flame, leading to similar issues.
- Do not include a new control factor (Fctrl) (Ecodesign water heaters, Annex III, point 4(a)), Energy labelling water heaters, Annex VIII, point 4(a) in the calculation of the water heating energy efficiency:
    - The correction for the control could lead to a malus of 5 %. The minimum values proposed in the working documents were made on the basis of EPREL, which includes values that are not taking into account this correction factor. As an example, of the impact, the current requirements in combination with this factor might eliminate (rough estimation) up to 80 % of the gaseous fuelled water heaters from the market.
    - The current definition is only suitable for electric instantaneous water heaters (electric and hydraulic controlled) not to other appliances. I
    - Slide 23 of the presentation shown during the consultation forum meeting refers to EN 13203-1, Clause 5.3.2.3; this Clause shows comfort criteria in four steps, how can this be covered by only two options?
    - Technical specification, such as temperature and volume flow, for Fctrl are missing. As an example, for gas fuelled water heaters the following definitions (from the EN 26) are missing in Article 2:
        - 3.1.1 Continuous water heater with fixed output (en: instantaneous water heater with fixed output) Device in which the burner is operated with a specific heat load
        - 3.1.2 Continuous water heater with adjustable output (en: instantaneous water heater with adjustable output) Device in which the thermal load can be reduced by manually actuating the gas flow control unit present in the device
            - 3.1.3 Continuous water heater with automatic power adjustment (AVO) (en: instantaneous water heater with automatic output variation) Device in which the gas flow is automatable so that the hot water temperature is kept within defined limits when the PTO flow rate is changed
            - 3.1.3.1 thermostatic appliance (en: thermostatic appliance) Device with automatic power adjustment, in which the gas flow is determined by a temperature controller that controls the water temperature, where the initial value can be adjustable or cannot be set
            - 3.1.3.2 Proportional device (en: proportioning appliance) Device with automatic capacity adjustment, in which the gas flow is proportionally controlled by the water flow, the proportional factor can be adjusted
        - 3.1.3 or Subcategories 3.1.3.1 and 3.1.3.2 correspond to gas appliances which “maintain a set water temperature independent of the water volume flow rate”... which, in the case of a malus scheme, has the factor Fctrl 1,0 and in the case of a bonus scheme, the value 1,05 or higher (Gas counterpart to “electronically controlled EIWH").
        - 3.1.1 and 3.1.2 would fall below 0.95 (malus regulation) and 1.0 (bonus regulation) respectively (gas counterpart to “hydraulically controlled EIWH")

Water heating energy efficiency requirements (based on the calculation method in current regulation and a PEF = 2,1, not including the effect of the passive flue heat recovery device and a correction for the control of 1):

Water heater type		3XS - S	M	L	XL	2XL	3XL	4XL
All	Regulation 813/2013	32	36	37	37	60	64	64
All smart		29	33	34	35	36	36	36
Electric instantaneous water heater	Working documents	42	45	45	45	45	N.A.	N.A.
	EHI proposal	-	-	-	-	-	-	-
Electric storage water heater	Working documents	38	43	44	44	45	N.A.	N.A.
	EHI proposal	-	-	-	-	-	-	-
Fuel storage water heater	Working documents	45	56	67	78	83	88	88
	EHI proposal	**45**	**56**	**60**	**62**	**72**	**82**	**82**
Fuel instantaneous water heater	Working documents	70	70	75	80	80	80	80
	EHI proposal	**50**	**65**	**70**	**72**	**75**	**85**	**85**
Electric heat pump combination heater	Working documents	85	85	105	105	120	130	130
	EHI proposal	**60**	**85**	**95**	**105**	**120**	**120**	**120**
TD heat pump combination heater	Working documents	55	66	77	88	93	98	98
	EHI proposal	**55**	**66**	**70**	**72**	**82**	**92**	**92**
Cogeneration	Working documents	45	56	67	78	100	105	105
	EHI proposal	-	-	-	-	-	-	-

Detailed reasoning

The detailed reasoning in Section 2.1.2 of this paper also applies here.

FIWH (fuel instantaneous water heaters) and FSWH (fuel storage water heaters)

Similarly to what happens for space heaters, it is not possible to connect a condensing water heater to an open multi flue chimney. Moreover, FSWH for L and XL tapping profiles are niche products for specific applications cases (sport halls / gymnasiums / small businesses / single-family households built in the 1980's), and for which they are still needed e.g. because no additional heating device is required. The requirements proposed are at the level of the best available technology, instead it would make more sense to reduce the ecodesign requirements and increase

the granularity of the label in such a way that the most efficient FSWH can be selected. As pointed out by the VHK report, their sales are decreasing in Europe; therefore the suggested requirements would be counter-productive, encouraging repair instead of replacement with more efficient appliances.

Thermally driven heat pumps

The requirements for thermally driven heat pumps are too high in the load profiles. Setting higher requirements will lead to higher purchase prices for these already expensive products.

3.2. Scope extension of the energy label

The working documents propose to expand the scope of hot water storage tanks to 2000 l to address the current issue of double testing for the same appliances for Ecodesign and Energy Label with two different load profiles.

What do we suggest?

To apply the energy labelling to water heaters and combination heaters with load profiles up to 2XL, because:

- Water heaters with 3XL or 4XL profile are primarily for commercial purposes. Purchase decisions are made by professionals, based on planning, commissioning, rather than on an energy label.
- Moreover, the number of appliances to be included would be very small (less than 1% of the market in 2014 according to VHK's task 2 report, and numbers have not grown in the meantime).

3.3. Smart functions

We welcome the proposal to keep the icon for off-peak and we welcome the suggestions to promote smartness.

We do however want to make the following considerations:

- For appliances that are smart grid enabled: introduce an icon on the energy label and consider a bonus.
- The definition of Energy Smart is missing
- The definition of smart grid enabled should be replaced by the following definition:

'smart grid enabled' means the heater is equipped with a controller which can (de)activate the heat generator and/or change the set store temperature depending on signals from third parties ~~electric grid operators~~ and/or equipment that controls on-site generated photovoltaic power.

3.4. Requirements related to emissions

We welcome:

- the proposed value in Ecodesign water heaters, Annex II, Point 1.3 for NOx emissions.
- the proposal to give different correction factors to the NOx emission limits for G30 (butane) and G31 (propane) respectively (Ecodesign wate heaters, Point 1.3 (a)).

What do we suggest?

- We welcome the introduction requirements related to 20 % hydrogen, biomethane and liquid biofuel (Ecodesign water heaters, Annex II, point 1.3(c) to (d)), however we propose a different scope, see Section 2.1 of this paper.
- Concerning liquid fuels we see that specific Nref values are missing in Table 8 in Annex IIIa to Ecodesign water heaters. This modification paves the way to products with higher NOx emissions and it would be a step back in comparison to the current requirements. We request to reintroduce the Nref as is the case in the current transitional method, i.e. Commission Communication 2014/C 207/02, par. 3.

3.5. Verification tolerances

We welcome the tolerances for the water-heating efficiency for heat pump water heaters and cogeneration water heaters, the sound power level and the emissions for nitrogen oxides (Ecodesign water heaters, Annex IV, Table 7; Energy labelling water heaters, Annex IX, Table 7)..

We believe however that the tolerance for the water heating efficiency of fuel driven water heaters and electric water heaters can be reduced to 5% on the basis of an evaluation of our product portfolio (Ecodesign water heaters, Annex IV, Table 7; Energy labelling water heaters, Annex IX, Table 7). Moreover, we believe that the standing losses for storage tanks (S) are too restrictive (Ecodesign water heaters, Annex IV, Table 7; Energy labelling water heaters, Annex IX, Table 7)..

The values of Q_{elec}, Q_{fuel}, $Q_{fuel,week}$, $Q_{fuel,week,smart}$, $Q_{elec,week}$, $Q_{elec,week,smart}$ are part of the water-heating efficiency, hence there is no need to include tolerances for these intermediate values; for the space heating energy efficiency no tolerances are included either for intermediate values.

3.6. Definition of drinking water

We would welcome the introduction of a definition for drinking or sanitary hot water, preferably aligned as much as possible with the definition for water intended for human consumption in the drinking water directive (Directive (EU) 2020/2184). This is to avoid misinterpretations of the scope of the Regulation.

What do we suggest?

Include the following definition for drinking or sanitary water (Ecodesign water heaters, Article 2; Energy labelling water heaters, Article 2):

'*drinking or sanitary water means:*

all water, either in its original state or after treatment, intended for drinking, cooking, food preparation or other domestic purposes in both public and private premises, regardless of its origin and whether it is supplied from a distribution network, supplied from a tanker or put into bottles or containers, including spring waters;

all water used in any food business for the manufacture, processing, preservation or marketing of products or substances intended for human consumption;'

3.7. Heat pump water heaters

3.7.1. Sound power

The testing method should remain unchanged (Ecodesign water heaters, Annex III, Point 3(a); Energy labelling water heaters, Annex VIII, Point 3(h)).

3.7.2. Electric heat pump water heaters that are tested using 'indoor air'

The working document leads to a confusion between 'indoor air' and 'non heated space air' products. The limitation of the storage volume and average power input for electric heat pump water heaters that are tested using indoor air should be clear for indoor air products only, but not affect the test condition for non-heated space air.

Common use of non-heated space air heat pumps is the domestic hot water supply of existing 1- or 2- family houses. They are installed in a non-heated space. Tank volume normally exceeds 200 litres and the power input is usually above 300 W. In comparison, indoor air heat pumps is the domestic hot water supply of existing 1 family houses, installed in heated space with a tank less than 140 l and a small nominal power.

What do we suggest?

- Create two separate test conditions:
  - for non-heated space air HPWH: 15 (12)°C

- for indoor air HPWH: 20 (15)°C
- Maintain the limitation of the 140 l for electric heat pump water heaters that are tested using 'indoor' (Ecodesign water heaters, Annex II, Point 1.4 (c))
- Maintain the limitation of 300 Watt for electric heat pump water heaters that are tested using 'indoor' (Ecodesign water heaters, Annex II, Point 1.4 (b))
- Delete the limitations for electric heat pump water heaters that are tested using non-heated space air

3.8. Hot water storage tanks

3.8.1. Multi-valent tank correction

We support the proposed multi-valent tank correction of 15 W for multi-valent tanks (Ecodesign water heaters, Annex II, point 7(d), Energy labelling water heaters, Annex VII, point 2.1), because these tanks allow for the storage of renewable energy sources into heating systems and therefore they should not be penalised for their heat losses.

However, we suggest to clarify that an electric resistance heater, which can be installed in the cleaning access opening and is able to use PV electricity is not eligible for this correction. Otherwise, this will create a loophole.

What do we suggest?

Change the definition of the multivalent tank (ecodesign water heaters, Annex I, Point (32); Energy labelling water heaters, Annex I, Point (37)) as follows:

'multivalent tank' means a hot water storage tank that allows heating its contents using at least two or more different internal heat exchangers or in case of buffer storage real heat generators;

3.8.2. Correction for stratification tanks

We support the proposal not to include a correction factor for stratification tanks at this point. The reason is that, there is no reliable correction factor available for storage tanks with better stratification, due to missing test methods. Any (real) advantage of "stratification" is therefore difficult to show. The reduced heat losses from such tanks seem to be only in the range of 10-15% (not 40% as estimated by VHK).

What do we suggest?

- The inclusion of a correction factor for tanks with better stratification should be part of the review clause of working documents (Ecodesign water heaters, Article 8; Energy labelling water heaters, Article 8).
- We request to include this topic in a request for standardisation to ensure a proper standard is available for the next review.

3.8.3. Test standards for hot water storage tanks

The use of EN12977 leads to non-comparable results of heat loss with EN15332 and EN12897 and therefore should not be used (no electrical heater, but a separate heating circuit with additional losses; no stationary measurement, but determination of a cooling curve).

What do we suggest?

- To remove the standard EN12977 from the transitional method (Ecodesign water heaters, Annex IIIa; Energy label water heaters, Annex VIIIa).
- Not to require unit of existing models to be retested according to one of the other test standards.

3.9. Drain water heat recovery device

The savings expected from drain water heat recovery devices are relatively low as the technology relies on the domestic hot water flow, which differs depending on the device itself and the end-user behaviour. A meaningful

calculation of the savings can only be done when the number of showers, the water usage during that shower, etc. is known.

In addition, this requirement does not make sense for suppliers, since manufacturers of water heating appliances are usually not the same manufacturers as those of drain water heat recovery devices. This is not the case for the other components of packages, which can usually be supplied by the same manufacturer.

As such, the drain water heat recovery device is usually not a matter of product regulation such as Ecodesign, but rather of building regulation.

What do we suggest?

Not to include packages of heaters with drain water heat recovery devices (Energy labelling water heaters, Article 1.1).

4. Unclarities, errors and editorial remarks

Working document on ecodesign for space heaters

Location	Working document	Correction	Reasoning
Annexes		Number all tables and refer to the correct Table number in the text	Several references in the text are wrong and several tables are not numbered
Annex I, (1)	…, including network standby	Clarify testing method for network standby	This is a new measurement for which the test procedure is unclear.
Annex II		Align the product information with the energy labelling product information and allow to upload this information on the product database also for ecodesign	There is no need to require two different information sheets for one and the same product
Annex II, 6(a)(2)	The declarations of H2-ready (yes/no) and the indoor/outdoor sound power LWA of the fuel boiler and cogeneration heater in dB(A) are mandatory information	The declarations of H2-ready (yes/no) and the indoor sound power LWA of the fuel boiler and cogeneration heater in dB(A) are mandatory information	Fuel boilers, electric boilers and cogeneration heaters do not have outdoor elements, hence requiring outdoor sound power as a mandatory information does not make sense.

Location	Working document	Correction	Reasoning
Annex II, Table 1, section B	LWA outdoor dB(A) (x)		Fuel boilers, electric boilers and cogeneration heaters do not have outdoor elements, hence requiring outdoor sound power as a mandatory information does not make sense.
Annex II, Table 1, section B	Eta0	Remove	It's not defined. Supposing that it has something to do with the modulation requirement, it is not appropriate to declare this efficiency value at Pmin. The difference between Eta1 and Eta 0 is negligible (lower than the measurement tolerance). It's only an additional burden for manufacturers (new test).
Annex IIIa	Tests are carried out at 30% of nominal heat input, at test return temperatures 30 ±0.5 °C (condensing boiler), 37±1 °C (low temperature boiler) or 47 ± 1 °C (standard boiler) or 50 ±1°C (other boiler). *Feed temperature of 50 °C for condensing boilers is to be applied*	Tests are carried out at 30% of nominal heat input, at test return temperatures 30 ±0.5 °C (condensing boiler), 37±1 °C (low temperature boiler) or 47 ± 1 °C (standard boiler) or 50 ±1°C (other boiler).	Delete the note regarding feed temperature. The reference standard EN 15502-1 does not specify such temperature for condensing boilers. Test procedures should not deviate from existing standards
Annex III, 3(c)	$\eta_s = (1/CC) \times SPER - \sum F(i)$	$\eta_s = SPER - \sum F(i)$	CC does not apply to thermally driven heat pumps
Annex III. Point 6, title	Sound power of heat pump and hybrid heaters	Sound power of heaters	Point 6 covers all heaters not only heat pump and hybrid heaters
Annex III, Point 6, subtitle	(a)	Heat pump and hybrid heaters	The first part is only about heat pump and hybrid heaters, so a subtitle needs to be introduced

Location	Working document	Correction	Reasoning
Annex III. Point 6, note	Note to CF: Part load condition B is at +2 °C outdoor temperature and at least at 54% part load (100% for fixed speed heat pumps) for MT heat pumps. Fixed capacity heat pumps will be tested with the given capacity as before. It is not a replacement for local or national noise regulations for on-site situations, but it is believed to give a relevant comparison basis for heat pumps of the same type. The 3 dB(A) penalty is severe to induce manufacturers to realise the feasibility of the test condition.	Note to CF: Part load condition B is at +2 °C outdoor temperature and at least at 54% of the design load. Fixed capacity heat pumps will be tested with the given capacity as before. It is not a replacement for local or national noise regulations for on-site situations in general, but it is believed to give a relevant comparison basis for heat pumps of the same type. The 3 dB(A) penalty is severe to induce manufacturers to realise the feasibility of the test condition.	In order to align with the new text.
Annex IIIa, Table 8, Section cogeneration space heaters	Sound power LWA, § 7.17 refers to EN 15036 - 1:2006 Heating boilers – Test regulations for airborne noise emissions from heat generators	Indoor sound power LWA indoor, § 7.17 refers to EN 15036 - 1:2006 Heating boilers – Test regulations for airborne noise emissions from heat generators	EN 15036 -1:2006 only covers indoor sound power
Annex IIIa, Table 8, Section combination heaters	Water heating energy efficiency and references: η_{wh}, Qfuel, Qelec, Qcor, AFC, AEC, V40	Water heating energy efficiency and references: η_{wh}, Qfuel, Qelec, Qcor,	AFC, AEC and V40 are not relevant for ecodesign
Annex V	HT	?	HT is not defined in Annex I

Working document on energy labelling for space heaters

Location	Working document	Correction	Reasoning
Article 4(e)	Where the product is a package any offer for a specific includes the….	?	Word missing
Annexes		Number all tables and refer to the correct Table number in the text	Several references in the text are wrong and several tables are not numbered

Location	Working document	Correction	Reasoning
Annex II, 3	No multivalent tank correction (mvc)	Include the mvc	Align with the working documents for water heaters
Annex III	1. Fossil fuel… 2. Fossil fuel… 3. Fossil fuel… 4. Electric heat pump… Label 5. Electric heat pump… Label 6. Gas-fired… Label 7 Fossil fuel…	1. Fossil fuel… 2. Fossil fuel… 3. Fossil fuel… 4. Electric heat pump… 5. Electric heat pump… 6. Gas-fired… 7. Fossil fuel…	Align the titles, either use number + title or Label number + title
Annex III	Roman numbers and explanatory text beneath does not always match		Align the numbers and the text
Annex III, 1, XIII	Outdoor sound power	Remove reference to outdoor sound power	These appliances do not produce an outdoor sound power
Annex III, 2	Symbol for solar	Remove symbol for solar	This is the label for non-solar assisted heating, the label for solar assisted heating is the label in point 3
Annex IV		Align the product information with the ecodesign product information	There is no need to require two different information sheets for one and the same product In addition, requiring the information in a given format is complicated for manufacturers and seeing that all data needs to be uploaded in the EPREL database it is unnecessary.
Annex IV, 2, package	[No/Yes] [if Yes, then specify: with solar-device/ temperature control/ storage tank/ other space heater(s)/cascade of x of the same heaters	Add information on the class of the control	Temperature control class is missing
Annex IV, 2, fuel source	[liquid fuel/gas/LPG]	[liquid fuel/gas/LPG/electricity]	Electricity is missing
Annex IV, 2, Annual fuel consumption	Annual fuel consumption (AEF in GCV) x kWh/a	Annual fuel consumption (AFC in GCV) x GJ	Align with Annex I, (106)

Location	Working document	Correction	Reasoning
Annex IV, 3, package	[No/Yes] if Yes, then specify: with solar device/ space heater with indirect tank/ space heater with indirect tank and solar-device/cascade of x of the same combination heaters		What is the difference between the first 'with solar device' and second 'solar device'?
Annex IV, 4, Storage volume in liter	Storage volume in liter	Delete	Storage volume is not relevant for temperature controls
Annex IV, 8, subtitle	Package of fuel and electric resistance space heaters and hot water storage tank (+three-way valve), water heating	Package of space heaters and hot water storage tank (+three-way valve), water heating	Wrong title, heat pump space heaters are also included
Annex V, 2(a)(2)	The declarations of H2-ready (yes/no) and the indoor/outdoor sound power LWA of the fuel boiler and cogeneration heater in dB(A) are mandatory information requirements		Outdoor sound power is not applicable.
Annex V, Table 1, Title	Information requirements for heat pump and hybrid space heaters	Information requirements for space and combination heaters	Wrong title
Annex V, Table 1, 2, Fuel source	[liquid fuel/gas/LPG]	[liquid fuel/gas/LPG/electricity]	Electricity is missing
Annex V, Table 1, 3	Indoor / outdoor noise		Outdoor noise does not apply for these products
Annex V, 2	2 Temperature controls	3 Temperature controls	Wrong numbering
Annex V, 3	For temperature controls	For hot water storage tanks	Wrong product
Annex V, 6, title	Packages of space heaters temperature controls and solar device	Packages of space heaters temperature controls and/ or solar device	Space heaters and controls are not always combined with solar devices
Annex VI, Figure 1	A to G ↓	A to G ↑	Align with the white goods

Location	Working document	Correction	Reasoning
Annex VIII, 10(b)	Note that 'combination heater' in this section can be a heater with water heating efficiency tested as indicated in point 6 of this Annex, or it can be a space heater converted to a combination heater with a water heating efficiency as calculated in point (c) of this Annex.	Note that 'combination heater' in this section can be a heater with water heating efficiency tested as indicated in point 6 of this Annex, or it can be a space heater converted to a combination heater with a water heating efficiency as calculated in point 11 of this Annex.	Wrong reference
Annex VIII, 11	t is the time the boiler can be assumed to supply heat for water heating, calculated as indicated (in h/day)	t_{on} is the time the boiler can be assumed to supply heat for water heating, calculated as indicated (in h/day)	
Annex VIII, 3(c)	$\eta_s = (1/CC) \times SPER - \sum F(i)$	$\eta_s = SPER - \sum F(i)$	CC does not apply to thermally driven heat pumps
Annex VIII. Point 12, title	Sound power of heat pump and hybrid heaters	Sound power of heaters	Point 6 covers all heaters not only heat pump and hybrid heaters
Annex VIII. Point 12, subtitle		(a) Heat pump and hybrid heaters	The first part is only about heat pump and hybrid heaters, so a subtitle needs to be introduced
Annex VIII. Point 12, note	Note to CF: Part load condition B is at +2 °C outdoor temperature and at least at 54% part load (100% for fixed speed heat pumps) for MT heat pumps. Fixed capacity heat pumps will be tested with the given capacity as before. It is not a replacement for local or national noise regulations for on-site situations, but it is believed to give a relevant comparison basis for heat pumps of the same type. The 3 dB(A) penalty is severe to induce manufacturers to realise the feasibility of the test condition.	Note to CF: Part load condition B is at +2 °C outdoor temperature and at least at 54% of the design load. Fixed capacity heat pumps will be tested with the given capacity as before. It is not a replacement for local or national noise regulations for on-site situations in general, but it is believed to give a relevant comparison basis for heat pumps of the same type. The 3 dB(A) penalty is severe to induce manufacturers to realise the feasibility of the test condition.	In order to align with the new text.

Working document on ecodesign for water heaters

Location	Working document	Correction	Reasoning
Annexes		Number all tables and refer to the correct Table number in the text	Several references in the text are wrong and several tables are not numbered
Annex III, 4			If it is the intention to apply Fctrl to all appliances in the scope, the scope

Working document on energy labelling for water heaters

Location	Working document	Correction	Reasoning
Article 3, Point 2(d)	Any advertisement relating to a specific space heater model… reference to the seasonal space heating …	Any advertisement relating to a specific water heater or hot water storage tank model… reference to the seasonal water heating or hot water storage tank energy efficiency class, as appropriate…	Mistake
Article 3, Point 2(e)	… a reference to the seasonal space heating energy efficiency…	… a reference to the seasonal water heating or hot water storage energy efficiency class or …	Mistake
Annex III			Titles and label titles are inconsistent, align also with the text for space heaters
Annex III, 1			The lower part of figure 1 is incomplete and the text below does not match the numbers on the figure
Annex III, 1, Title	(not climate dependent)		Why are packages with solar devices not climate dependent?
Annex II, 2.2, X	Pictogram for the EU map showing three climate conditions….	Pictogram for the EU map showing three global radiation zones….	These are not climate conditions
Annex IV, 1.1			Same comment as for space heaters, align the information requirements

			with ecodesign to avoid double declaration for the same products
Annex IV, 2, Annual fuel consumption	Annual fuel consumption (AEF) x kWh/a	Annual fuel consumption (AFC) x GJ	Align with definition for annual fuel consumption
Annex IV, Climate	Climate	Radiation zone	These are not climate but radiation zones
Annex V, figure 4	A to G ↓	A to G ↑	Align with the white goods

About EHI, the Association of the European Heating Industry

EHI represents 90% of the European market for heat and hot water generation, heating controls and heat emitters, 75% of the hydronic heat pump market, 80% of the biomass central heating market (pellets, wood) and 70% of the solar thermal market. EHI Members produce advanced technologies for heating in buildings, including: heating systems, burners, boilers, heat pumps, components and system integrators, radiators, surface heating & cooling and renewable energy systems. In doing so, they employ about 120,000 people in Europe and invest over a billion Euros per year in energy efficiency. *www.ehi.eu*