(Draft) Minutes 1st meeting

Working Group 4 'Water heaters'

Meeting date: Monday 20 January 2020, 10:00–17:00
Place: Room 3D, Centre Borschette (CCAB), Rue Froissart 36, Brussels, Belgium

The list of attendants is in Annex I.

1. Opening

Veerle Beelaerts (policy officer EC) opens the meeting and gives a short introduction of the project. Martijn van Elburg (chair, VHK) explains the different working groups and the discussion document that structures today’s meeting. The (draft) agenda is accepted.

2. Scope

Align Ecodesign and Energy labelling

The chair presents the options to either keep the current differences between Labelling and Ecodesign scope, add 3-4XL to the Labelling scope or define the scope using load profiles only.

Fanny Rateau prefers keeping the reference to kW and L and suggests having an exemption for 3XL and 4XL in the Labelling regulation to avoid double testing. Stella Benfatto agrees that double testing should be avoided but cannot present a proposal yet. Michèle Mondot says the Label scope should include 3-4XL and prefers the same rules for combi boilers. Laure Meljac agrees and adds that if the scope remains limited to 2XL there will be no declaration for HPs for colder and warmer climate (there is no information requirement for combi heat pumps higher than 2XL). Carlos Lopes proposes to include 3XL and 4XL in the calculation as well as on the label.

The chair invites attendants to send position papers and comments and suggests a deadline of 4 weeks from today¹.

Single regulation

The chair presents the option of combining all water heating performance (both dedicated and combination heaters) in a single regulation.

Michèle Mondot does not agree and proposes the merging of water heaters and space heaters in one regulation. Valérie Lammerant, Ingo Seliger, Laure Meljac express support for this proposal; Laure Meljac adds that this could avoid having two labels on the device.

¹ Deadline is then 17 Feb 2020.
François-Yves Prévost raises the point of (combi/water) heaters using air (so-called multifunctional products). The chair replies that this is related to the study on ventilation products and that it is not yet known if and how to deal with such products. Fanny Rateau states she does not see the advantage of including combi products into Lot 2. She adds that the proposal for simplification needs to be checked with EHI-members. Stella Benfatto does not support inclusion of multifunctional products and says the merging of multiple regulations into one will be discussed.

Gideon Blij says that a combi heater and water heater are two different products, and warns against too much simplification and suggests to keep the regulations separate. Jérôme Martel agrees.

3. Definitions

Drinking water

Fanny Rateau agrees with the proposal to add a definition of 'drinking water', but suggests alignment with the (draft) revised Drinking Water Directive.

Michèle Mondot adds that the meaning of "domestic purposes" has to be clarified as it can mean different things. The chair states that "domestic purposes" basically means tap water.

H₂ / biofuels

The chair suggests to await the discussion in WG1 (Hydrogen) on the definition of hydrogen admixtures and biofuels.

Off-peak

The chair presents a definition for 'off-peak'. Fanny Rateau states that there are better definitions than in the current Regulation 814/2013, she mentions the standard EN 16147, and that there are other things that have to be taken into consideration.

William Walker Rosevinge Rode adds that off-peak is not only during the night; it can also be during the day, for load balancing and/or electric grid stability purposes. He proposes to include (consider) a form of smart functionality.

Stella Benfatto agrees with the definition, but says it needs to be complemented by a definition of 'smart', as an 'off-peak product' is not necessarily a smart product.

Carlos Lopes supports the definition of off-peak products, but also says it should be wider, incorporating smart appliances.

Michèle Mondot argues to clearly specify what is off-peak and what is a smart product as these are two very different products.

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2 https://ec.europa.eu/environment/water/water-drink/review_en.html. The current draft COM/2017/0753 says: ‘water intended for human consumption’ shall mean all water either in its original state or after treatment, intended for drinking, cooking, food preparation or production, 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, for spring waters, put in bottles.

3 The updated prEN 16147 (CEN/TC113/WG10, N115) has as definition "off-peak product (is) a water heater that is energised for a maximum period of 8 consecutive hours between 22:00 and 07:00 of the 24 hour tapping pattern". This is not substantially different from the 'definition' in the Regulation.
Heat generator

Fanny Rateau asks if ‘solar’ is included as a heat source, does it mean that a solar device and a solar panel are defined as a heat generator? This could influence other regulations as well. With regard to the definition of water heater as heat generator and housing, she asks for the reference to housing to be deleted, as it is not relevant for water heating.

Pedro Dias says it is obvious that solar energy is a heat source, but he would like to see the concrete implications of a change in definitions considering also the outcome of relevant discussions in other work groups.

Peak temperature

The chair presents an option to better define ‘peak temperature’. Michèle Mondot agrees that what is written in the Guideline 2018 is not satisfying, but she adds that the methodology of the test should not be in the regulation - only a proper definition should be in the Regulation so that standardisation bodies can take them up in the standards. To be clear: the peak temperature is not the temperature in the tank, but the temperature of the tapped water. The 2018 Guidelines suggestion to change the load profile if 55°C cannot be reached is inadequate (as smaller load profiles may also require a 55°C tapping or have maximum storage volumes easily exceeded). She proposes to use the former 2015 Guidelines.

Jérôme Martel adds that it should be an average temperature (of the tapping). He prefers a simple definition in the regulation and keeping the measurement methodology in the test standard.

François-Yves Prévost states that some water heaters are not able to reach 55°C temperature by themselves and rely on back-up heaters. Changing the method requires retesting and may remove products from the market. The chair replies that this change is already in the guidelines for 2 years.

Ingo Seliger states that the definition in the Regulation 814/2013 suffices, and that the explanation in the 2018 Guidelines adds to confusion and should be removed.

Fanny Rateau notes that this point also seems relevant for WG3 (Calculation) and/or WG2 (Testing).

4. Storage tanks

Storage tank test standard

Fanny Rateau mentions that EHI-members are interested in using standard EN 15332 but asks for a reasonable transition period. William Walker Rosevinge Rode adds that EN 12897 is more practical for overall testing and conformity checks and agrees with the need for a sufficient transition period to avoid retesting. Stella Benfatto is also in favour

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4 Regulation 814/2013 states: Annex I, (8) 'peak temperature' (Tp) means the minimum water temperature, expressed in degrees Celsius, to be achieved during water draw-off, as specified in Annex III, Table 1.

5 The 2018 Guidelines state (in Question 57): The peak temperature Tp shall be calculated as a mean value over the water draw-offs with a minimum value as specified in the tapping cycles. In cases where the peak temperature is not reached, additional the product cannot be declared under this tapping profile and needs to be tested under another tapping profile.
of a single standard for storage tank heat losses as is Michèle Mondot. Ingo Seliger is in favour of using EN 15332 and mentions a sufficient transition period.

Pedro Dias mentions the differences between EN 12977-3 and EN 15332 where the former produces additional parameters relevant for the solar industry and prefers continuation of use of EN 12977-3. This proposal is supported by Stephan Fischer.

**Minimum storage tank temperature**

The chair presents an option to make the water heating performance test more realistic by including anti-legionella measures (raise overall storage temperature and/or include periodic disinfection).

Jérôme Martel states that double regulation should be prevented as this is a safety topic already covered by the drinking water directive. He says the calculation in test standard EN 16147\(^6\) is accepted. Fanny Rateau mentions that this calculation is included in the Transitional Methods. Michèle Mondot adds that safety is covered by national legislation and conditions are different everywhere, so she suggests not to consider them in an energy efficiency regulation.

The chair explains that Ecodesign is indeed not a safety regulation, but emphasises that we are discussing the possibility to make the test more realistic.

Michèle Mondot warns that such an approach might result in excluding products from a market, whereas national regulations do not require periodic heating above 65°C (in France it is not obligatory for tanks <400 liter).

Andreas Bohren states that latest research shows that the problem of legionella is not in the storage tanks, but in the pipelines. He as well would not like to mix safety and efficiency regulations.

Laure Meljac mentions that tapping profiles ensure a minimum user comfort. She understands the need from a consumer point of view, but there are other ways to eliminate legionella, not only heating the water to 65°C. Adding it to a test possibly impedes innovation. She proposes a check to make sure the product can reach 65°C (when required in national law).

William Walker Rosevinge Rode states that the Norwegian rules require heating up the tank to 65°C periodically. He agrees with inclusion of (energy consumption for) disinfection in the test.

Carlos Lopes clarifies the discussion refers to storage water heaters, not (passive) tanks. He agrees with Laure Meljac, i.e. to ensure the product can reach 65°C if required.

Jan Tichelaar is in favour of a more energy friendly way to prevent legionella, but safety should come first. Adding periodic heating to a test should not be mandatory, because of different requirements in the Member States, but would allow consumers to see the difference when required.

Pedro Dias adds that standardisation work is ongoing in EN806-2 which might be important to follow.

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\(^6\) Where a fictional heater is used to meet the difference between tapped water temperature and peak temperature 55°C, as mentioned by Jan Tichelaar.
**Multivalent storage tanks**

Fanny Rateau in principle supports the recognition of multivalent storage tanks, but she has multiple considerations such as whether the correction will apply to the tank as single product or a package.

Pedro Dias states it is important to promote these products but a better understanding of the proposal is needed, as it not clear how this can be done through labelling.

Jan Tichelaar states that the heating loss should reflect the real insulation value of the tanks and should not be corrected. The benefits of multivalent tanks should be made visible through the system in which they function rather than undoing the disadvantage of a higher heat loss.

Michèle Mondot agrees with Jan that the measured heat loss should form the basis. She adds that the many possible configurations make it difficult to define appropriate thresholds. The minimum heat loss threshold should be maintained and the benefits should be promoted if the tank is combined in a system.

William Walker Rosevinge Rode and Carlos Lopes support the correction for multivalent storage tanks.

Michèle Mondot asks whether (some) multivalent storage tanks are banned from the market because of the threshold. The chair puts the question before the manufacturers. William Walker Rosevinge Rode remarks that multivalent tanks are close to the threshold and confirms the extra heat losses can be a problem.

Carlos Lopes is in favour of tougher requirements and can accept a correction for multivalent tanks. René Kemna asks for a response by Jan Tichelaar. Jan Tichelaar potentially supports a correction combined with more stringent limits. Ingo Seliger is in principle against such allowances but states that an extra heat exchanger is so expensive no benefits are gained from cheating.

Stefan Abrecht states that thermal solar systems compensate for these losses, so it makes sense to correct for it on the tank level as well.

**Storage tanks with better stratification**

Laure Meljac states that the current V40 test covers the effects of stratification within storage tanks. And a minimum V40 value is prescribed in the regulation, but not for combi heaters. In EN 16147 it is allowed to heat up the tank while tapping.

Andreas Bohren states that when charging the storage tank you disturb the stratification, which is not directly covered in a V40 test. Although the stratification test was developed by SPF he still sees some problems and is not in favour of including this in a regulation yet. He mentions that in Switzerland you can get a subsidy for tanks with good stratification.

William Walker Rosevinge Rode, Stella Benfatto and Fanny Rateau support the promotion of stratification but agree with Andreas Bohren that there is no European test standard at this moment, which makes it complicated to set requirements.
Jérôme Martel mentions that standard EN 60379 allows assessment of the mixing factor (based upon average storage temperature with and without cold water flowing into the tank).

Carlos Lopes states that if good stratification improves system operation, it needs to be promoted. The Commission needs to issue a standardisation request and then decide on adding it to the label or as information requirement.

René Kemna says that manufacturers claim higher performance of tanks due to better stratification, up to 40% even – is that possible?

Ingo Seliger replies that there is a maximum benefit of 10-20%. It is possible to calculate the performance of a certain system and the maximum possible capacity based on temperature and volume. Small stratification tanks are better than large tanks.

Ralf-Rainer Nolte adds that the use of smart control is important when using these tanks.

5. PFHRD/T

Gideon Blij explains his involvement in the development of this test standard. He explains that in order to measure the heat recovery of the flue gas it is relevant to limit thermal bridging (that indeed only flue gasses contribute to the thermal performance). High flue gas temperatures will increase the thermal gains. The maximum energy you can recover should be based on a realistic house.

Fanny Rateau states it is premature to include it and more data is needed. According to her the savings are not as high as stated in the report: 5-7% based on a study in the UK market. She adds that safety issues should also be addressed.

René Kemna replies that many manufacturers have already introduced PFHRD in their products. He says that EHI members claim 9% savings for PFHRD without thermal store, increasing to 20-25% with thermal store.

Christoph Schreckenberg states that the UK is a very specific market and expresses some concerns about the standard EN 13203-7 also following ECOtest results for other EN 13203 parts. He finds it is too early to discuss requirements. He wants more data to find a common solution.

René Kemna mentions that the regulation requires looking into PFHRD, a technology that has been around for more than 10 years and that if we do not decide during this review on the inclusion of PFHRDs, we may have to wait another five years, while the products on the market claim various performances. The goal of the revision is to achieve effective savings. He asks for more clarification of concerns.

Gideon Blij states that the standardisation working group (TC109/WG 4) has seen a lot of discussion, but also that the different participants/manufacturers came to an agreement. The system temperatures in the standard can be seen as a compromise of higher system temperatures in the UK (small radiators, high heat demand) and lower

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7 PFHRD means passive flue heat recovery device (or PFHRT for technology). It can be used in both (fuel fired) dedicated and combination water heaters. For combination heaters the presence of a thermal store in the PFHRD is relevant as it can recover energy from space heating for water heating.
system temperatures in for instance Germany (in case of underfloor heating). In June 2020 it is expected the standard will be finalised. He states there is sufficient measurement data as PFHRD’s have been on the market for many years. The problem was to find consensus on the standard.

Lunch break

6. Solar device – simpler package label calculation

Pedro Dias presents a simplified method for solar devices. The method is based upon existing collector standards and ScenoCalc annual output calculations and produces a lookup table for the improvement factor, based upon the number of collectors and annual demand. He expects that the method can be finalised by mid-March.

Fanny Rateau is in favour of a simpler calculation method, but is awaiting a deeper assessment.

Michèle Mondot (on behalf of Emanuel Léger) agrees that a simplified method is a good approach, but suggests to consider certain correction factors (such as storage characteristics, as applied in the Assotermica method) in order to have a table which will better differentiate the products. She also mentions that SOLCAL should indeed be replaced, but SOLICS should remain. Pedro Dias explains that the simplified method does not use either SOLCAL and SOLICS.

Pedro Dias states that the current method does differentiate between products. As regards Assotermica, their method is more focused on existing systems which do not have all performance data available. He adds that the current method (in the regulation) does not take into account storage at all. This is confirmed by Ingo Seliger.

Andreas Bohren states that the SOLICS method is based on a very old ISO standard under Chinese convenorship. Furthermore market surveillance is difficult for SOLICS and easier for EN 12975 (and the proposed method).

Stefan Abrecht adds that correction factors are not needed as each collector is individually assessed and reflected in the lookup table.

Andreas Bohren mentions that there are several methods 'on the table' and he invites all involved to come together and discuss a single method. The chair adds that the method requires that heat demands are known, for DHW as well as for space heating.

7. Solar water heater – label design

Michèle Mondot remarks that on RAC\textsuperscript{8} labels it is optional to have three climates (she asks Veerle if it will be mandatory for RACs. Veerle Beelaerts replies the proposal is to make it mandatory). Michèle adds that if solar heaters get three climates on the label, then (heat pump) water heaters should also get it, preferably mandatory.

Carlos Lopes asks if the EU figure for solar systems should be based on solar irradiation instead of temperature. He agrees that persons using solar water heating are more often

\footnotesize\textsuperscript{8} RAC = Room Air Conditioner
adjusting their behaviour, and suggests the regulation could award some control to adjust for this behaviour e.g. a timer that turns off the electric back-up during the night, possibly something similar as in local space heaters.

Fanny Rateau is in favour of including three climate zones on the label.

Stefan Abrecht is also in favour of including climate zones. Thermosiphon heaters are usually sold without back-up heater. Because of the high solar fraction in the Warmer climate the use of back-up heating does not make a big difference, but in the Average climate it does. User behaviour is the biggest influence of the energy use, but Stefan thinks it is not possible to reflect that in labels.

Pedro Dias states that the use of controls depends on the countries where they are installed. In Greece it is mainly on-off controlled, in Portugal timers are used. Pedro will collect some ideas how to address this. Carlos Lopes says that if only a simple temperature control is applied, it may be heating up during the night, which also reduces the solar fraction the day after. Carlos and Stefan agree that a smart control may solve such misuse.

8. Technology-specific Ecodesign requirements

The chair presents the following technology specific requirements.

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Legend:
EIWH = electric/electronic instantaneous water heater; ESWH = electric storage water heater; GIWH = gas instantaneous water heater; GSWH = gas storage water heater; Storage-COMBI = combination heater with storage tank; Instant-COMBI = instantaneous combination heater; HPWH = heat pump water heater

Notes:
[1]: For oil-fired versions of the GIWH, GSWH and COMBI, multiply the limit values by 0.95
[2]: Limits are close to maximum for electronic EIWH, at pef=2.1, according to catalogue values.
[3]: Limits for 3XS-XL derived from pef-corrected current regulation. For XXL/3XL/4XL they are close to maximum.
[4]: Own assessment. Limits will eliminate (indirectly) heaters with permanent pilot flame as requested.
[5]: Based on best catalogue data (AO Smith)
[6]: Limits also apply to gas-fired heat pumps (A7/W55) as well as fossil fuel boilers with external indirect cylinder. Limits derived from instant-combi minus storage standing losses
[7]: XL-limit assumes integrated instantaneous PFHRD. XXL/3XL/4XL limits assume integrated storage PFHRD (<3L). Example: Intergas Xtreme 36 (XXL, 115% on GCV)
[8]: Limits based on A7/W55 EN16147. Values derived from catalogue data. The S-class value is based on a (downward) corrected value that could be realised by a variation on the Lydos hybrid (currently M with 90% efficiency). Limits also apply to electric heat pumps with indirect cylinder (A7/W55).

René Kemna explains that in a traditional preparatory study the least life cycle costs (LLCC) provide target values. The specific review study of 2016 showed that
improvements lead to lower LCCs. He asks stakeholders for comments on proposed requirements, supplemented with data, also for cogeneration.

William Walker Rosevinge Rode states that the ESWH limits of 44% and 45% for L to 4XL are too high. He states that fully electric storage combi’s will be removed from the market. And he adds that combination heat pumps have differences in performances, sometimes leading to ESWHs used for DHW. He is willing to provide exact figures to VHK.

Laure Meljac mentions it is unclear in which category combination heat pumps are included. She adds that combination heat pumps might not be able to reach the same values as the dedicated heat pumps for water heating, so the values should be lower.

René Kemna clarifies that the combination heat pumps are not shown in the table, but there will be thresholds for these products and more information is required.

Michèle Mondot explains that combination heat pumps are a huge market in France, and because of their market share they need to be considered in a new category. She will share data. Different thresholds are used for these heat pumps compared to dedicated heat pumps and EN 16147 is the standard used for testing.

Fanny Rateau raises questions on the grounds of the proposal because there is a higher complexity regarding which product will fall into which class. She sees that some values are based on the best catalogue values and not LLCC. She would rather keep the technology-neutral approach and tackle problems specifically such as electrical water heaters. She emphasises the need to use at least one decimal instead of rounded figures.

Jérôme Martel supports the technology specific proposal, but this requires also more data. If off-peak is changed it will have an effect on the end-results. The limits for heat pump water heaters seem to be too high. And he remarks that for ESWH’s, the rounding to one decimal is indeed important.

Valérie Lammerant raises a concern that by using this approach we should not harm already very energy efficient appliances.

Ingo Seliger states that the requirements for heat pump water heaters are too high, and that instant-combi tapping profile ‘L’ should be set at 80%.

Carlos Lopes is happy that technology-specific requirements are proposed, but understands the need for data. This data can be provided or analysed by: (1) Industry, (2) EPREL-data (as it is available for market surveillance authorities, it should be available to VHK) or (3) gather data through web crawling. Heat pumps have almost the same losses as electric water heaters, while they have just a small share of the market, so we need to have less stringent requirements. He states it is more effective to have good requirements for the bulk of the market and lesser or no requirements for cogeneration and heat pumps, as that could hinder innovation.

Michèle Mondot does not see why it is a problem to have technology specific requirements for domestic water heaters, while this is already the case for space heaters. What about gas sorption heat pumps, where are they included? Ingo Seliger
remarks that for gas appliances, including (gas) sorption heat pumps, there is a DHW standard: EN 13203-6.

Fanny Rateau says that if we are going to split into different categories based on the LLCC we want to be able to look at the data behind it. Veerle Beelaerts replies there is thorough analysis for the LLCC, and asks for help in collecting the data from suppliers. René Kemna adds that the table was created after a lot of discussion whether this was the right approach. If the values are too high, then we want to know. Veerle Beelaerts says this document will go to the Consultation Forum and depending on that decision we know what to do for the review. Stakeholders are currently leaning towards technology specific requirements. For now we need to go into a discussion about the numbers, not into a political discussion.

Laure Meljac adds that the data used is based on the current regulation and standards, so changes in for instance temperatures are not included. This needs to be taken into consideration when making assumptions/changes to the data.

Christian Koch thinks the values for EIWH are ambitious but attainable. 46-47% would be the maximum, but that would mean that the energy label would just have one class.

Alain Maillard agrees with the table, but only when we keep the current testing methods and if we are discussing requirements with a digit, that means we are at the limit of what we can achieve.

Pedro Miguel Abrantes states that GIWH at 55% for tapping profile ‘S’ is no problem, the percentage of tapping profile ‘M’ (75%) is a bit high, and the step to ‘L’ (80%) is too high. Limits for L and XL above 75% are not feasible as there is no different technology involved.

The chair asks what to do with pilot flames (permanent ignition devices), do we need to eliminate them?

Pedro Miguel Abrantes states that the impact on the energy use is very small (3-4%). he advises against a phase-out as there is a big low cost market for it. He states that most people know the costs and turn on the permanent ignition device only when the appliance is being used. He adds that the XL tapping profile already applies to relatively small appliances, and care needs to be taken.

Christoph Schreckenberg adds that he has to check the numbers presented in the table, but will come up with data. He agrees with Pedro Miguel Abrantes on the permanent pilot flame.

Jan Tichelaar states he supports higher efficiencies that phase out permanent pilot flames and expects other products will take their place.

**DWH Energy labelling classes**

The chair explains that a PEF correction (from 2.5 to 2.1) is applied to the values below 40% and that another correction was applied in class XS/S to correct a problem in the market where the renewable and conventional appliances end up in the same scale. The 3XL and 4XL have been included (see the discussion on ‘scope’).
François-Yves Prévost asks why there is no rescaling of the label? Veerle Beelaerts replies that this would not respect the decision of Parliament and Council to have rescaling in 2026, as stated in the revised Energy Labelling Regulation. She adds there is time after finalisation of this study and depending on further discussions here and in the Parliament the Commission can decide what to do.

Jérôme Martel asks if classes will be removed before there is rescaling or just a change of efficiency classes due to the PEF correction?

Carlos Lopes asks the Commission to consult Member States and the parliament to check if we should rescale the label to A-G immediately. Electric heaters will not be able to move to the higher classes because the step increase is too high. We also want to stimulate development of the smaller units.

Several stakeholders have difficulty interpreting which labels remain on the market or not (red line in table shown in presentation). The table shown is not technology specific and the revised ecodesign requirements (per technology or general) do not align with label class limits. The table will be revised.

**9. HP test conditions / calculations (wet bulb, brine, new DHW HPs, thermodynamic, PVT, etc.).**

**Wet bulb**

Jan Tichelaar does not oppose the proposal, but raises a point of concern related to over-dimensioning ventilation volume flow. He states that mixing is already applied, but in that case the 20°C test condition is not appropriate anymore.

François-Yves Prévost mentions that the actual ventilation airflow is taken into account when calculating the performance assessment in France.

Michèle Mondot states that there is a need for clarification of what is meant with indoor air and suggests using 15/12°C for "indoor air from unheated spaces" and 20/15°C for "exhaust air". The Table 4 in regulation 814/2013 has to be revised.

Jan Tichelaar asks what happens if heat is extracted from unheated space and temperatures drop below 15°C.

Stella Benfatto has no position yet.

Carlos Lopes states (on behalf of Denmark) that 59% humidity is relatively high and not necessarily better. He asks whether the change from 20/12°C to 20/15°C makes a difference between products and whether it is worth the extra cost of retesting.

Laure Meljac remarks that the air that goes to the exhaust system normally is more humid, thus the 15°C is closer to reality and preferred. It is expected to have an effect on the performance.

William Walker Rosevinge Rode says that higher humidity can lead to more frequent defrosting. François-Yves Prévost remarks that this is true for outside air, but not necessarily so for ventilation air as it will never go down to zero degrees.
Brine temperatures

Laure Meljac states that the reason for multiple climate conditions for brine temperatures is because the current 0/-3°C conditions is rather extreme and not certainly not representative for average and warmer climates. Testing costs would increase with €5000 for one additional testing point (or €8000 if with DHW). The test conditions at 0/-3°C and 10/7°C are often already measured (as brine and water HPs can be quite similar).

Christoph Schreckenberg is not in favour of adding brine conditions as he states the temperature is more a design point and actual brine temperatures will always very per location and not necessarily per climate zone.

René Kemna explains that it is asking for just one extra testing point at 5/2°C and asks whether interpolation between 0 and 10°C is acceptable? Laure Meljac expects the error when calculating the performance in the additional condition by interpolation is not too big.

Carlos Lopes confirms that higher temperatures are more realistic of actual conditions. Even in Sweden brine is never below 0°C. He will send information on studies where that show brine temperatures are often higher.

Ingo Seliger does not see a relation between climate zones, air temperature and ground temperature and does not agree there is evidence for the proposal.

René Kemna proposes to use 5/2°C as brine test condition for future use and allow interpolation between 0 and 10°C in the short term. Veerle Beelaerts adds that changing the standard may take two more years.

DHW HP technologies not adequately covered

DHW HP without storage

Jan Tichelaar states it is difficult to estimate the efficiency of a combined product that hasn't been tested as such.

Laure Meljac adds that the combinations of HP heat generator + storage tank is typically for multi-family buildings, where it is unlikely the heat generator and tank are sold together. Nowadays heat pumps specifically designed to produce DHW are put on the market without being tested as DHW HP, but as a space heater. She argues for inclusion in the Regulation as DHWH, considering that the efficiency will not be the most realistic but at least it is better than today.

Jan Tichelaar replies that instead of having a useless label, it may be better to not have a label at all. Laure Meljac adds that if we do not label them it should be clearly excluded from the scope of the regulation. Jérôme Martel says it should be looked at. Michèle Mondot replies that the result of exempting them could be that more unregulated heat pumps without storage tanks enter the market. The chair agrees that an exemption could open a loophole.

New HP designs for other heat sources

Fanny Rateau mentions that reliable standards need to be developed before we put requirements. Stella Benfatto suggests to refer it back to the standardisation body and ask for a standard. The chair replies that the test conditions are proposed by the
Technical Committee responsible for the standard and is proposed upon their request as well.

William Walker Rosevinge Rode mentions that there are also systems that use sea water with exchange to fresh water circulation, for cooling and providing heat for heat pumps.

Carlos Lopes thinks low temperature district heating is a growing market especially in colder climates. Laure Meljac agrees and states that the temperatures are a proposal from WG10 and that Denmark already has some experience with such systems.

Jan Tichelaar makes a point that even low-temperature heat is created and not taken from the ambient. This should be accounted for one way or another.

**Thermodynamic HP’s and PVT’s**

Michèle Mondot states that CETIAT has done some tests, and are developing the method further for inclusion in EN 16147. Stephan Fischer asks if the test method can be shared. He adds that they have developed their own method and can provide it to us. Michèle Mondot remarks that TC312 will organise a workshop for hybrid heat pumps, where it could be included. Most thermodynamic HPs are intended for DHW but their efficiency cannot be calculated with the current regulation.

The chair suggests leaving PVTs to WG1 and await their conclusions.

10. **NOx**

Jan Tichelaar states that (for combination heaters) the NO\textsubscript{x} emissions are based on space heating. He proposes to include water heating in a weighing formula for NO\textsubscript{x} as the balance in heating demand is shifting towards water heating.

Michèle Mondot states on behalf of a boiler specialist that it is relevant to measure NO\textsubscript{x} on space heating basis, because water heating usage is low.

Christoph Schreckenberg adds that any change to a test would result in a different result which has to be kept in mind when revising requirements.

Fanny Rateau states that the NO\textsubscript{x} correction proposed should also apply to (DHW) gas heat pumps.

11. **Horizontal topics**

Verification tolerances, conformity assessment, cogeneration and hydrogen-related issues will be discussed in the other working groups. The chair asks for consideration of the following two topics.

*Resource efficiency*

The chair asks to share test results concerning new standards on resource efficiency (repairability, recyclability, remanufacturing) and other material efficiency standards nearing completion.
Shower heat recovery

Ralf-Rainer Nolte informs the group that during the next CENELEC TC59X WG4 meeting (5 February 2020) more data will be presented on heat recovery with such systems. The report will be sent to VHK when ready.

Closure

The chair states that position papers, other comments or data on the topics discussed should be sent to VHK preferably within 4 weeks from today (deadline: 17 February 2020), thanks all participants for coming and ends the meeting.
## Annex 1 – Attendance list

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tbody>
<tr>
<td>Matteo Rambaldi</td>
<td>APPLiA</td>
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<tr>
<td>Angelo Mancini</td>
<td>AristonThermo/EHI</td>
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<td>Gideon Blij</td>
<td>Atag</td>
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<td>Pedro Miguel Abrantes</td>
<td>BBT/EHI</td>
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<tr>
<td>Alan Clarke</td>
<td>BDR Therma/EHI</td>
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<td>Christian Koch</td>
<td>Clage/APPLiA</td>
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<tr>
<td>Michèle Mondot</td>
<td>CETIAT/EHI/EHPA</td>
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<tr>
<td>Valérie Lammerant</td>
<td>Daikin/EHI</td>
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<td>Jan Tichelaar</td>
<td>ECOS</td>
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<td>Stella Benfatto</td>
<td>EHPA</td>
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<tr>
<td>Patrick Milin</td>
<td>Engie/Marcogaz</td>
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<tr>
<td>Alain Xhonneux</td>
<td>Enerconsult</td>
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<tr>
<td>Ivan Malenković</td>
<td>Fraunhofer</td>
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<tr>
<td>Stephan Fischer</td>
<td>Uni Stuttgart/Solar Heat Europe</td>
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<tr>
<td>Jérôme Martel</td>
<td>groupe Atlantic/EHI/APPLiA</td>
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<tr>
<td>Laure Meljac</td>
<td>NIBE/EHPA</td>
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<tr>
<td>Pedro Dias</td>
<td>Solar Heat Europe</td>
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<tr>
<td>Stefan Abrecht</td>
<td>SolarHeatInitiative</td>
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<tr>
<td>Andreas Bohren</td>
<td>SPF/Solar Heat Europe</td>
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<tr>
<td>Ralf-Rainer Nolte</td>
<td>Stiebel Eltron/APPLiA</td>
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<td>Carlos Lopes</td>
<td>Sweden</td>
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<td>Gerard van Amerongen</td>
<td>VAconsult</td>
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<td>Christoph Schreckenberg</td>
<td>Vaillant Group/EHI</td>
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<td>Ingo Seliger</td>
<td>Viessmann</td>
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<td>William Walker Rosevinge Rode</td>
<td>Norway</td>
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<td>François-Yves Prévost</td>
<td>Aldes</td>
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<tr>
<td>Fanny Rateau</td>
<td>EHI</td>
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<td>René Kemna</td>
<td>VHK</td>
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<td>Martijn van Elburg</td>
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<td>Pepijn Wesselman</td>
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<tr>
<td>Roy van den Boorn</td>
<td>VHK</td>
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