Panasonic comments on the discussion paper
WG2 meeting “Test conditions”

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Following the web-based working Group 2 ‘Testing’ meeting, that took place April 2nd, Panasonic would first of all like to thank the study team for the work carried out so far. We welcome the opportunity to provide comments on the presented discussion document regarding ‘Testing’ issues, as follow-up of the Review study of eco-design and energy labelling for space heating boilers, combination heaters (Lot 1) and water heaters (Lot 2). Our comments focus on the following points, responding to the questions of the discussion document.

1. Harmonized testing for heat pumps: maintain current rating applications regime of 55°C, as mandatory rating application, as it reflects heat pump usage in existing buildings.
2. Compensation testing: the compensation method is not ready for implementation and should be further assessed by relevant standardisation bodies.
3. Third Party conformity assessment: Panasonic strongly recommends to maintain the status quo both for Lot 1 and Lot 2 as no tangible risk will be prevented, or added-value provided to consumers.
4. Proposal for advanced controls: We support maintaining the temperature control factor F(1) at 3%, and allowing for dedicated discussions on bonuses for advanced control features in the next WG 2/WG3 meeting.
5. Heat pump test setting mode: The proposal needs further clarification. Furthermore, defining a common mode is a highly complex matter.
6. Display Eta_s on Energy Label: Panasonic welcomes and supports this proposal intended to improve comparability between products.
7. Verification tolerances: We recommend maintaining current verification tolerances for electric and gas engine heat pumps.
8. Sound: The issue should be further dealt with within standardisation, in order to define more representative rating conditions.

1. Harmonized testing for heat pumps

Panasonic believes the current mandatory rating temperature regime, of 55°C for heat pumps, is fully adapted for customer needs in existing buildings and should be maintained. We recommend maintaining the current rating application temperatures to 55°C (medium) and 35°C (low), as they are representative of real-life customers’ needs.

The proposal to increase the rating temperature for heat pump, from 55°C to 65°C, is not in line with recent studies, by the Fraunhofer Institute ISE and the Danish Technology Institute DTI, that clearly demonstrate that the maximum temperatures in existing buildings are already well covered by the 55°C medium temperature application setting for heat pumps.

Furthermore, the proposal goes against all the ongoing building energy efficiency policies at European and national level. In fact, European and national policies (EPBD and its implementations) have clearly identified the reduction of the heating supply temperature as the most cost efficient approach to achieve sustainable energy saving. Medium temperature application supports this approach by encouraging existing dwelling owners to first engage in heat demand reduction activities. For instance, by prescribing actions like insulation, envelope and emitter improvement, before replacing their heat generators. Requesting heat pumps to achieve higher temperature to fit the heat demand of less efficient houses is a wrong signal to send to end-users and would slow even further building renovation levels.
Authorities, manufacturers and installers, have invested countless efforts to provide tools and support to consumers with assessing whether a heat pump is suitable for the replacement of older heat-generation systems. Both efficiency and cost effectiveness are the key drivers when providing recommendations, which include necessary preliminary building improvements, where applicable. As the installation of a heat pump is usually an significant investment, consumers are also thoroughly evaluating all aspects of the solution, before choosing it over much cheaper alternatives. This is also corroborated by several Member States assessments, that confirmed the fitness of the medium temperature rating with real-life usage for existing buildings, where heat pumps were installed.

The limited uptake of heat pump in the renovation market is not due to the “unrealistic efficiency figures” as claimed in the report but is mainly due to financial reasons. A large portion of retrofit market is populated by the lower end of the income spectrum, i.e. where capital cost of the heating system is a major decision factor. Furthermore, for those incomes, the payback time is often too long to opt for a heat pump. In most of those houses, large design capacity is needed; that is why installer/national incentive schemes recommend end users to work first on building insulation and emitters before replacing the heat generator. Without those steps, requiring high temperature of the emission system will result in lower efficiency of the system making the annual energy saving lower and payback time longer.

Basic thermodynamics in a vapor compression cycle, dictates that the lower the sink temperature, the better the efficiency results. Thus increasing the temperature of the rating application, encouraging end-users to install higher temperature without improving their building will result in the loss of potential efficiency improvement both of systems and buildings, going against eco-design and EPBD principles.

The first incentive for industry is market demand, high temperature (HT) heat pumps exist since many years. The HT rating are available in the performance rating standard EN 14825, manufacturers can test, declare and certify product accordingly on a voluntary basis if there is the necessary consumer demand. However, market demand is very low and those applications remain a niche market, due to the various reasons listed above. Introducing mandatory HT rating in ErP will not create any additional demand or make heat pumps more attractive to consumers to a level that would sufficiently incentivize the industry to develop HT heat pumps on a mandatory basis. Thus, Panasonic does not agree with the proposal of a mandatory HT regime for heat pumps.

2. Compensation Method

Panasonic believes the method is far from being ready to use. The appropriate forum, i.e. standardisation bodies, should address this within a sufficient and appropriate timeframe. Before being able to assess whether the compensation method is fit for purpose and ready to be implemented, reliability, repeatability and the reproducibility of such testing methodology should be investigated, for all capacity modulating products covered by Lot 1.

Although Panasonic welcomes the efforts to make the testing method closer to real life use, and to prevent circumvention, we believe the presented method is neither ready to be introduced nor the solution to reflect more real-life performance. The presented method is far from being market ready and operational for any testing laboratory in Europe.

As indicated in BAM’s presentation, the issue is already being treated in standardisation with strong support from the industry, to which Panasonic is actively participating and contributing. This approach should be kept without transfer to regulation mandate, because the method is not finalized, does not cover all capacity modulating products under lot 1 and its reliability, repeatability and reproducibility are still unproven.
As with many stakeholders, and for the reasons above, we strongly disagree with the proposal made to introduce the compensation method in a transitional method. As previously highlighted by the consultant in WG 3; having bits and pieces, across a variety of documents, can only create confusion and increase the risks of misinterpretation. Rushing its introduction through legislation can create risk and uncertainty for all actors.

As the willingness to consider the method and assess it in the standardization process has been established, this assessment process need to take its normal course within standardization.

3. Third party conformity assessment mandatory for other heaters

Panasonic is not in favour of the introduction of mandatory third party conformity assessment (TPCA) (verification or certification) for heat pumps. Thus, we recommend to maintain the status quo, both for Lot 1 and Lot 2.

The EU New Legislative Approach relies on CE marking to offer high efficiency products to European customers. The New Approach philosophy links the need for third party verification primarily to the risks entailed by the product and calls to avoid imposing modules that will be burdensome in relation to the risks covered as stated in decision EU 768/2008 article 4. This approach should not be changed and should remain the rule for ErP products. Market surveillance that functions both properly and efficiently through effective product testing, is the only tool to ensure compliance with EU product design rules. Our reasoning is twofold: (1) heat pumps do not raise the need for safety assessment; (2) eco-design focuses on energy performance of products and not safety.

Until today, self-declaration is the method used for placing electric heat pumps on the EU market. It has been proven that the accuracy and reliability of the data reported for heat pumps has improved over the years; thanks to new testing methods, improvement of measuring equipment and simulations. No major change in the market or in technologies have taken place that would trigger the need for the introduction of third party certification. In addition, major changes of testing methods could be expected in the future (c.f. point 2 on compensation method). Therefore introducing a mandatory third party conformity assessment while considering the introduction of a new testing method is not reasonable. Priority should be given to improving testing methods.

Heat pumps are complex thermodynamic systems, for which performance is difficult to assess by only looking at the design documents. They require extensive and costly testing in laboratories at various conditions. In this respect, contrary to the claim, this proposal aims to achieve a level playing field, heat pumps cannot be compared to boilers, for which third party involvement was initially introduced for safety reasons, and later extended to performance. Because heat pumps follow the bin methodology and test at several capacity steps, generally for two application (LT and MT), this results in 11 test points compared to 2 for boilers. A complete test for heat pumps will take more than a week, while it will only takes one day for a boiler. Furthermore, we often hear the arguments that for domestic hot water heat pumps mandatory TPCA, the expected benefits do not justify the additional cost and duration of the test. In reality, the same holds true for space heating and combi heat pumps.

For manufacturers without their own accredited test labs, the introduction of mandatory third party conformity assessment, before placing the product on the EU market, will be challenging to implement. Considering the numerous conditions to test and the current limited number of accredited laboratories that can perform those tests, will result in lengthy processes and delays in delivering new highly efficient products to customers.
Panasonic participates in several voluntary third-party certification schemes in Europe, such as MCS, Eurovent, NFPAC and EHPA Keymark, covering the entire range of our products. Those schemes have been put in place, based on harmonised standards and current regulations, including stringent requirements, testing obligations and samples selection. They take several months to be thoroughly completed. Considering the limited capacities for testing in Europe and the number of tests to be performed, we are concerned that the criteria for mandatory conformity assessment may, as a result, be water-downed in order to satisfy the total demand for mandatory third party conformity assessment. In this case, the outcome would not benefit consumers, as the standard requirements (criteria for conformity assessment) would be lower than the current ones used in voluntary certification schemes.

For those reasons, and considering the current functioning of the heat pump market, which is complemented by efficient market surveillance, Module A remains the most suitable option both for consumers and manufacturers alike.

In addition, it cannot be guaranteed that voluntary schemes would disappear leaving the space to mandatory TPCA, if introduced. Indeed sometimes, they cover extra criteria above pure performance requirements or eco-design obligations. We are concerned that if mandatory TPCA is introduced, the data checked would not be automatically recognized by national authorities, and subsequently their national subsidy schemes or lists, further jeopardising the uptake of heat pumps.

Last but not least, the new Regulation on Market Surveillance and Compliance has just been approved and will take effect soon. This Regulation aims to strengthen controls by national authorities and customs officers, to improve checks on products on the EU market and remove illegal and unsafe products. The new rules include obligations to improve information sharing and coordination among national authorities, but also with third-party countries. Market surveillance authorities are now allowed to undertake joint activities with stakeholders such as manufacturers, associations and end-users, to identify compliance. For product groups, where there is a high risk of non-compliance, the European Commission can take further measures in cooperation with market surveillance authorities. Therefore, we recommend to wait and see the effects resulting from this new Regulation before extending mandatory third party conformity assessment to all products covered by Lot 1.

4. Proposal on temperature control factors

Panasonic is supportive of 1) maintaining controls for heat pumps under Lot 1 and 2) the proposal to maintain the F1 correction factor at the current value of 3%. Furthermore we believe that advanced feature enabled by IoT could provide substantial energy savings. We would welcome further discussion of a bonus for such features within WG 2 and WG 3.

We believe the current correction factor F1 of 3% is well adapted and should not be further increased.

We see significant merits in the EHI proposal to consider more advanced control features enabled by IoT, that could provide substantial energy savings for the consumer and improve the product usage in line with eco-design goals.

Heating product controls are continually evolving and have come a long way since the definition of the temperatures classes in the regulation thanks to the generalisation of faster and more performant electronics, connectivity and IoT. Even for already existing control functions, IoT’s have made them more flexible, intuitive and accessible to end users and optimized harvesting of the energy savings, these functions could offer.
In conclusion, this proposal is an opportunity. Among the merits of introducing a thoroughly impact assessed bonus scheme, for advanced features under Lot 1 for heating systems:

- To ensure understandable benefits for both consumers and industry, incentivising the development of advanced control features for heating products.
- To bring clarity, simplify and facilitate the consumer choice, by focusing on one regulation and few indicators (Etas, energy labelling class) rather than a multitude of labels.
- To engage consumers in investing in controls with their heating system, to ensure a best performing product.
- To avoid either complicated horizontal regulation or no regulation at all for these systems.
- To have controls tailored for the heat generators themselves, ensuring optimisation of heating operation and efficiency (other aspects like energy optimization, smart buildings could be managed within other lots).
- To avoid missing out on some specifics functionalities that may be lost if controls are considered horizontally.
- To avoid loopholes or duplication/unnecessary requirements.
- To allow for differing level of services offered through controls (product, system, building, grid and so on).

In light of the above, the introduction of a bonus for new advanced control features, of course following a comprehensive assessment, can be seen as the most straightforward incentive for consumer and industry. Thus, Panasonic would welcome this topic to be further discussed in the next WG 2/WG3 meetings, in order to understand and exchange views on the definition of each function and its weighting.

5. Heat pump 'settings'

Further clarification on this topic is highly welcomed. It is highly complex to fix common test mode setting for heating product.

We understand the concern raised by the consultant, however we are not in a position to see how this will apply today to complex heating products. Settings and ‘modes’ of heating products are much more complex than other consumer products. Lot 1 products are targeted to professionals in order to service, commission and fine tune the product to the consumer’s installation and needs. This complexification is bound to increase with the generalization of connectivity, smart controls and development of components controls. For all those reasons it will be very difficult to develop meaningful common settings, for testing for all products under the scope of Lot 1, without hindering manufacturer innovation. Therefore it is recommended that the testing procedure continue to solely focus on test conditions and usage scenarios.

6. Display eta_s on Energy Label

Panasonic welcomes and supports the proposal to display the efficiency value on the Energy Label.

Within Lot 1, energy classes can be quite wide especially for top classes (70% points between A and A++) which may lead to consumer categorizing two products as similar in term of efficiency based on the energy classes while there is a significant difference in their actual efficiency. Including the actual efficiency value on the label will help consumer to better distinguish between products overall and in particular within same or adjacent class.
On the European market consumers are not limited to Lot 1 products, when choosing their heating solution. Consumers can opt for a solution from another ecodesign lot (Lot 10, Lot 21, ...). While energy labelling class limits are quite different between these lots and Lot 1, they use the same efficiency indicator, similar calculation (bin methodology) and are covered by the same performance rating standard (EN 14825). Including the efficiency value on the label will allow consumers to compare Lot 1 products with these other products more easily.

Including the efficiency value on the energy label, easily accessible to the consumers, should incentivise system-users to better understand the rated efficiency value, considering it as a reference value to evaluate their installation, leading potentially to identification of potential deviations and, then, corrective measures.

7. Verification tolerance

| Verification tolerances for electric and gas engine Heat pump should be maintained at their current level |

As highlighted by the ECOTEST project, for heat pump category, the existing deviations between laboratories exceed even the defined verification tolerances. Thus maintaining the verification tolerances at their current level is necessary.

The scope of the ECOTEST project was limited and did not cover gas-engine heat pumps (GEHP). Their behaviour can be compared to electric heat pumps, rather than gas absorption heat pumps. The verification tolerance for GEHP should be maintained.

8. Sound power test conditions

| Panasonic strongly questions the feasibility, scope fitness and robustness of the proposed sound, compressor fan frequency mapping and declaration. Eco-design requirements should be representative of the use of the heat pump in average running conditions and common for all product. Thus, it is not possible to define test conditions leading to maximum sound power level for all units because the conditions to generate this level are related to specific settings for each individual unit. |

We believe that the eco-design rating conditions are targeted to represent performance of the product under the most common/average usage scenario, and are mainly targeted to provide a simple and fair way to compare products. Linking sound power condition to compressor, and or fan speed, is not in line with this approach and will create loopholes as these conditions are solely based on manufacturer design and will differ from one unit to another, which will mislead the consumer when comparing them.

As the conditions in which maximum sound power occurs, in reality differ from one unit to another, are dependent on heating capacity delivered and are not representative for the normal use of a heat pump. Maximum sound power level information is not ready to be displayed according to the existing framework and test conditions.

Standardisation bodies should continue the work on adjusting the current test conditions so they are:

- the same for all units;
- representative of the normal average unit running conditions during the heating season; therefore, testing at very low temperature is not relevant for end users because it does not happen in certain EU countries or only occur very rarely.
- lead to steady-state operation of the unit during the acoustic measurement. Therefore, cycling should not be considered during test measurement;
- related to a heating capacity already declared for seasonal performance rating.

Once such test conditions are defined and proofed, they can be further considered under regulation.