Position Paper

Position on the review of Energy Labelling Regulations 2015/1186 (ENER Lot 20) for local space heaters and 626/2011 (ENER Lot 10) for air-to-air heat pumps, air conditioners, and comfort fans

22 August 2022

EXECUTIVE SUMMARY AND RECOMMENDATIONS

The European Commission is reviewing energy labelling Regulations (EU) No 2015/1186 for local space heaters (ENER Lot 20) and (EU) No 626/2011 for air-to-air heat pumps, air conditioners, and comfort fans (ENER Lot 10). EPEE, the voice of the air conditioning, heat pump, and refrigeration industry in Europe, supports the EU ecodesign and energy labelling policies, and agrees with the need to keep the legislation up-to-date and in line with the latest technological and market developments.

This paper provides EPEE's position on the most recent proposals from the Commission on the review of the energy labelling regulations for ENER Lots 10 and 20, and additional points raised during the Consultation Forum. We explain our support to merge the energy labelling of both product groups, as we believe that this will help consumers choose the most energy efficient products, across heating/cooling technologies, and thus to make selection decisions that maximise their contribution to the EU's decarbonisation objectives.

EPEE strongly supports the proposed merger of energy labelling classes

1. Merging the energy labels for cooling between ENER Lot 10 technologies and in heating across ENER Lot 10 and 20 products will increase energy savings
2. A merged energy label will enable consumers to make informed choices

EPEE recommendations for optimising energy savings under the merged labelling classes

3. Revise the proposed cooling and heating class distributions – based on EPEE views
4. Further assessment needed on control features
5. Adapt the layout of the Energy Label
   - 5.1 Avoid misunderstanding by including energy efficiency values and leaving out energy consumption
   - 5.2 Clarify that declarations for warmer and colder climate are optional

5.3 Reinstate the requirements from the current Energy Labelling Regulation for providing the energy label in the box
6. Reconsider the introduction of the compensation method
7. Exclude data centre cooling from the scope
8. Maintain one sound power instead of two for reversible units
9. Maintain the market surveillance tolerance values of the current regulation
10. Adhere to at least two years between publication and enforcement of new rules
11. Ensure alignment with the ongoing review of the Primary Energy Factor

Annex I: Technical comments

Introduction

EPEE, the voice of the air conditioning, heat pump, and refrigeration industry in Europe, welcomes the opportunity to provide comments on the proposed merger of the energy labelling classes under ENER Lot 20 (local space heaters) and ENER Lot 10 (air-to-air heat pumps, air conditioners, and comfort fans). We welcome the European Commission's consideration of industry comments concerning the proposed merger, and we fully support the need for reviewing the energy labelling rules in line with the latest technological and market developments.

We believe that the proposed merger will be beneficial for energy savings, consumer choice and experience, as well as for air quality (both indoors and outdoors). This paper further elaborates our support for the proposed merger of the energy labelling scales, in cooling within ENER Lot 10 and for heating between ENER Lots 10 and 20.

EPEE strongly supports the proposed merger of energy labelling classes

1. Merging the energy labels for cooling between ENER Lot 10 technologies and in heating across ENER Lot 10 and 20 products will increase energy savings

EPEE supports the merger of the energy labels for local (space) heaters (ENER Lot 20) and air conditioners (ENER Lot 10), as we believe that this step can contribute significantly to achieving the EU's heating decarbonisation objectives. All product groups under both regulations have heating as a function, and the use of heating options that are the most efficiency should therefore be further elaborated.

Air-to-air heat pumps (ENER Lot 10) are increasingly used as a heating system to replace electric (Joule-effect) space heaters in several countries. Similarly, portable and double duct air conditioners are often considered and marketed as an equivalent solution to a split air conditioner. For these reasons and in those cases, the consumers should be made fully aware of the significant efficiency gap between these technologies.

As such, the proposal to merge the energy labelling scales for heating between ENER Lot 10 and ENER Lot 20 products and between splits and portable (SD/DD) in cooling is fully aligned with the EU's Green Deal objectives, particularly the Energy Efficiency First principle, and will contribute to delivering energy security under the REPowerEU Initiative.

2. A merged energy label will enable consumers to make informed choices

We strongly believe that one single label layout for all heating products and one scale for all cooling products helps consumers choose the most efficient technologies to heat or cool their home by ensuring direct comparability across different solutions. This principle has been confirmed in practice by the European Commission's *'Study on consumer understanding of the energy label for space heaters and air conditioners.'* EPEE fully endorses the consumer study's conclusion that merging the labels will help consumers to select the most efficient heating and cooling solutions.

Moreover, the principle of merging energy labels of comparable product groups providing the same function has already been applied for the existing energy label for heat pumps and boilers (ENER Lot 1), meaning that the proposed approach for ENER Lots 10 and 20 is fully coherent and in the same spirit as existing legislation.

In summary, EPEE welcomes solutions that foster simplicity and easy-to-read energy labels. The merger, emphasising one scale when comparing different technologies that deliver the same function, improves the provisions of information to consumers, enabling them to make the most efficient heating/cooling decision, which helps delivering the European Green Deal.

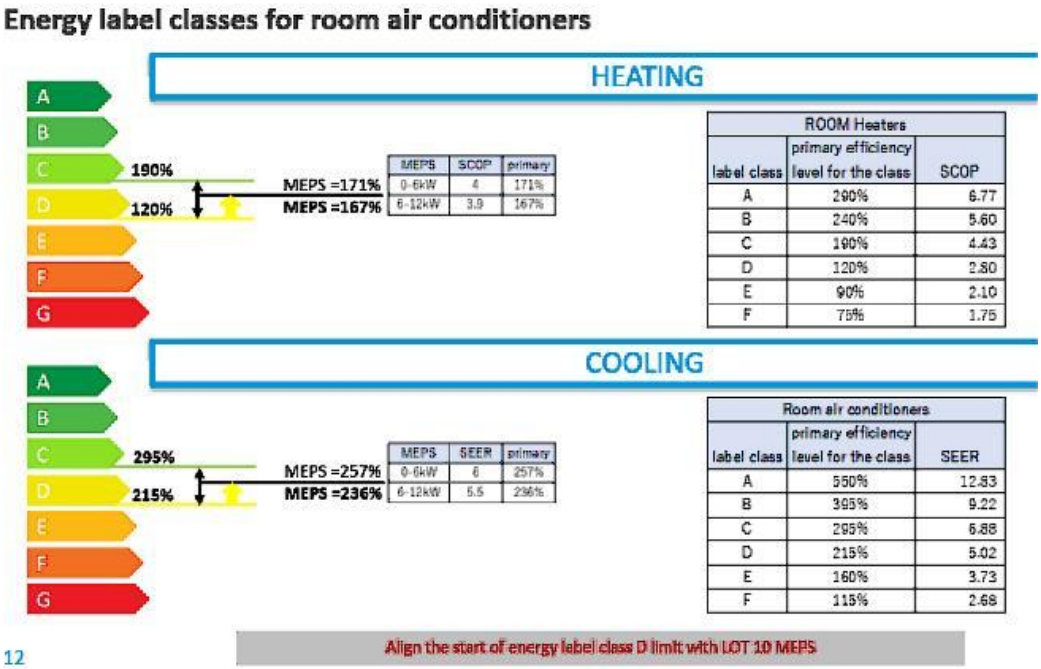
EPEE recommendations for optimising energy savings under the merged labelling classes

3. Revise the proposed cooling and heating class distributions – based on EPEE views

On the 'Working Document (May 2022) Draft elements of possibly merged labelling regulations for room heaters, room air conditioners and comfort fans'

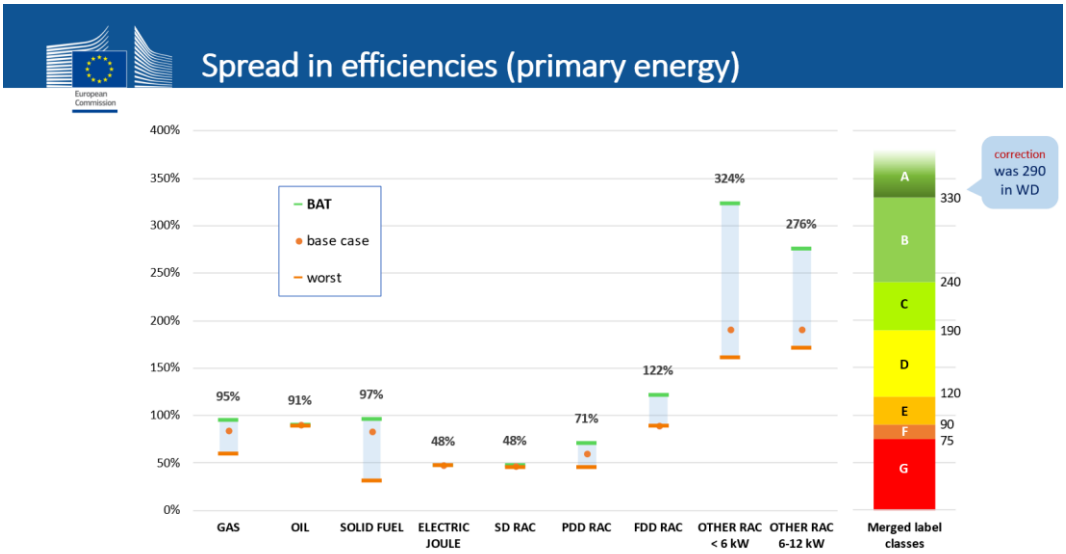
EPEE would like to raise the following elements regarding the proposal circulated in May 2022 ahead of the Consultation Forum.

The minimum efficiency requirements (MEPS) for ecodesign on air-conditioners and air-to-air heat pumps are set within the band for the energy label class D with the current merger proposal. This narrows down the label class significantly. Therefore, we propose that the start of energy label class D is aligned with the minimum efficiency requirements of ecodesign for air-conditioners and air-to-air heat pumps and re-divide the energy label classes of D, C and B. These three classes should be available to allow differentiation between air-conditioner and air-to-air heat pump products. EPEE proposes the below classes:

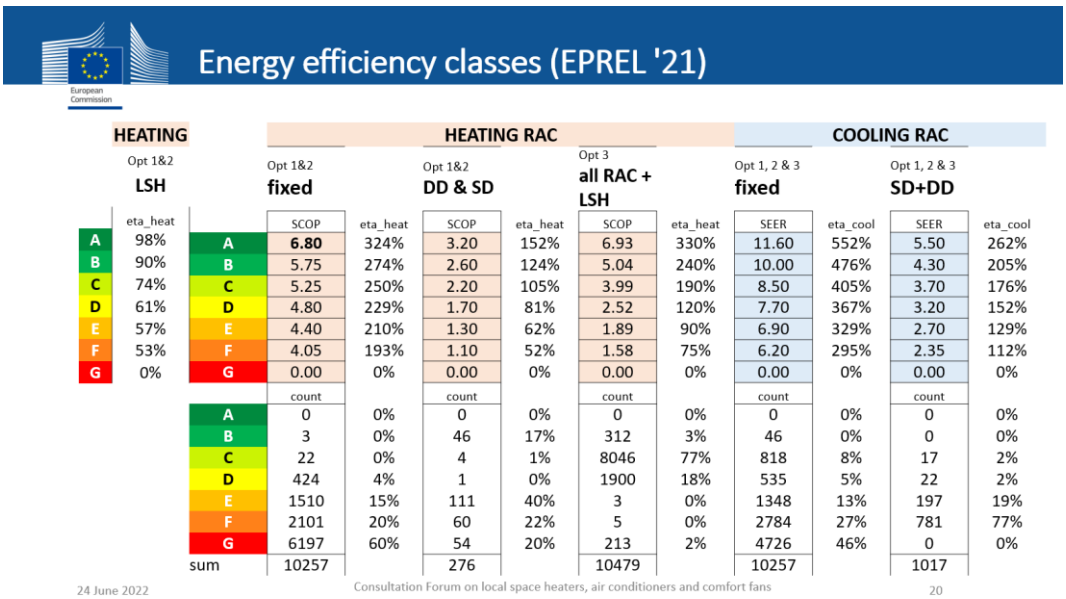


On the 'Labelling Consultation Forum 24 June 2022 V2' presentation

After the Consultation Forum, a corrected version of the presentation was circulated to stakeholders containing several corrections but without detailed explanation of the corrections. EPEE was extremely surprised by this new version which was not discussed during the Consultation Forum.



As shown above, in heating it is proposed to correct the lower limit of class A from 290 % to 330 %. EPEE assumes that this new value has been determined based on EPREL scrutiny. However, it is EPEE's assessment that this value is inaccurate and is actually a typo when cross-referenced against other sources of information for the assumed BAT units. For this reason, a lower eta value for class A limitation is more appropriate for the current and future market situation.



EPEE strongly disagrees with the new technology specific energy efficiency classes. As already explained above, EPEE strongly believes that the approach to merge LSH, RAC and SD&DD is

the most appropriate way forward for the heating scale. Similarly, EPEE believes that merging the cooling scale for RAC and SD&DD is the most appropriate way forward.

Please find below detailed comments and recommendations for improvement on each option

- Heating RAC options 1 & 2:
  - As indicated, the limit for class A should be lower than 330 % (there is in the market no unit with and SCOP of 6,8; the current BAT remains at a SCOP of 6.2; typos in EPREL).
  - EPEE strongly challenges the class distribution provided for under options 1 & 2 in heating. Under these new class limits, 95 % of the fixed RAC market falls in classes E, F, and G. For the following reasons, placing the majority of RAC products in the three lowest efficiency classes is counter to the Energy Efficiency First principle and provides misleading information to consumers:
    - Fixed (split) air-to-air heat pumps are by far the most efficient room heating technology among all the heating technologies considered (under ENER Lot 10 or considering both ENER Lots 10 and 20), thus it is inappropriate for the technology to populate the lowest three (orange and red) efficiency classes.
    - Including RAC in the lowest three efficiency classes would place them in the same classes as less efficient space heating technologies. This would defeat the purpose of the merger proposal, which is intended to clearly compare and differentiate between more efficient and less efficient heating technologies to improve the ability of consumers to choose the most efficient heating technologies. A2A split RAC, with efficiencies several times higher, would rank lower than SD & DD and LSH, which would mean that in consumers' eyes Joule-effect and SD/DD are more energy efficient than heat pumps. The new proposal in grouping all heating technologies in the three lowest efficiency classes would be seriously misleading to consumers.
    - To remain true to the spirit of the merger proposal, split RAC should populate the top classes B, C and D. In any case, classes E, F, and G should not be populated by the most efficient technology.

- Heating RAC option 3 should cover RAC, LSH and SD&DD:
  - As indicated, the limit for class A should be lower than 330 % (there is no unit on the market at 6,8 SCOP; the current BAT remains at a SCOP of 6.2; typos in EPREL).
  - To ensure appropriate differentiation, classes B, C, and D should be only populated by split RAC.

- Cooling options 1, 2, and 3 for fixed:
  - EPEE strongly challenges the class distribution provided with the newly proposed class limits. According to the above, 86 % of the fixed market would be distributed in classes

E, F, and G, despite the fact that split RAC is the most efficient cooling technology available. Therefore, RAC should rightly populate classes B, C, and D. The three lowest classes, E, F, and G should not be populated with RAC at all.

- The new proposal fails to respect the Energy Efficiency First principle and fair information towards consumers. With this proposal, SD&DD will rank C or D and are even given the luxury of an empty G class, while almost half of splits of much higher energy efficiency products will rank in G.

EPEE strongly urges the European Commission and the Member States to revise the proposed cooling and heating class distributions to ensure that they always guide the consumer to identify the most efficient technology providing the function required.

4. Further assessment needed on control features

The five control features for fixed air-conditioners and air-to-air heat pumps included in the calculation of the seasonal energy efficiency of a system need to be clarified in terms of selected controls, accumulation (weighting factors), verification, and assessment. It was explained during the Consultation Forum that the control features have been determined based on ENER Lot 10 and limited desk research. EPEE believes that is it necessary to understand whether the proposed control features are common in the marketplace and if the bonus values proposed are realistic and are not misleading to the consumer.

Clarification is needed on whether the declared control features must be integrated or if they can be supplied via web/app and as part of a product bundle/package, i.e., as an accessory, and how this should be reflected in the energy label. EPEE suggests limiting the declarations for the control features to one option (default one for the model) and enabling the digital generation of energy labels and declarations when additional options are added. Declaring all control features for units that may also be used in several combinations between indoor and outdoor units would be a challenging administrative burden in terms of generating all the required data and considering the obligation to upload to the EPREL database.

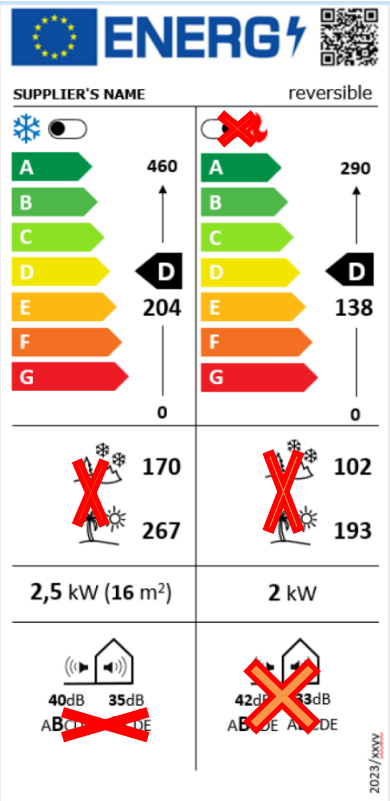
Finally, EPEE would like to raise concerns on the enforceability and verifiability by market surveillance of such requirements. Market surveillances will have to check whether the control features are correctly reflected in the declared seasonal efficiency and available for the consumer. It is currently not clear how this will be handled, and this approach should be clarified.

5. Adapt the layout of the Energy Label

5.1 Avoid misunderstanding by including energy efficiency values and leaving out energy consumption

It is essential that the energy efficiency values expressed in eta remain on the energy label in a prominent way. This will ensure granularity and comparability of labels especially for products in the same class or adjacent classes by providing an accurate reflection of the difference in efficiency between units.

EPEE supports the current Commission proposal without energy consumption on the energy label. Including energy consumption on the label would lead to misunderstandings and incorrect representation of the true consumption of a unit towards the end-users. Certain products, such as air conditioners, have an energy consumption that depends on where the product is installed. This is affected by many factors, including the location of the building, the building type, the behaviour of users in the building, occupancy, etc.



The indicative floor area for cooling must be removed from the label. The calculation is not clarified, and the proposed value is based on a load that is not representative for room air conditioners (see ENER Lot 10 preparatory study) and represents over-dimensioning of the system in the room. Furthermore, each building has a specific load, in a specific climate, with different insulation and different usage patterns, and hence wrong conclusions may be drawn by the consumer when selecting the size of the unit for cooling the room. Also, building energy performance requirements are moving towards zero emission buildings, which will require to reduce the load of buildings significantly.

P_{ratedh} at heating mode for average climate should be $P_{designh}$ at heating for average climate, as $P_{designh}$ reflects the design load (see draft definition 24). This is in line with the current regulation and is relevant in terms of comparing and selecting units, since it reflects the capacity that the unit can reach for average climate at outdoor temperatures of -10 °C (design conditions). P_{ratedh} (+7 °C outdoor temperature) is a temperature point of lower relevance when selecting a heating appliance.

The use of the heating and cooling buttons (on the top of the label and next to the symbols) are unclear and may create confusion by consumers. A better indication is needed. The

"flame symbol" referring to heating mode of operation for the product should be changed. It may lead to misunderstanding among consumers and can be associated with combustion products. The merged label covers not only combustion systems using fossil or biomass fuel but also products using electricity.

5.2 Clarify that declarations for warmer and colder climate are optional

EPEE urges the legislators to clearly state in the regulatory text that declarations for warmer and colder climate are optional, as this was intended in the explanatory note. Based on the ENER Lot 10 (RAC) study, the average climate seems to be the most relevant climate for the products in scope of the new regulations for the merged energy labels for RAC and LSH. For cooling, there is only one temperature bin used for the calculation of SEER and the corresponding cooling efficiency. Therefore, regardless of the climate, the declared cooling efficiency for the given unit will remain the same.

In terms of comparability, indicating one climate is sufficient to allow the consumer to properly compare the products. Furthermore, having the three heating efficiencies on the energy label can be confusing for the consumers and has no added value for their choice of heating appliance: highly efficient units under average climate will perform with high efficiency in warmer or colder climates as well. Also, for products specifically marketed for colder climates, it is a benefit to have the climates optional. It is a means to differentiate these products from those that are not intended for colder climates. Therefore, we see this additional information as optional and available upon request to the distributors or accessible via the QR-code.

5.3 Reinstate the requirements from the current Energy Labelling Regulation for providing the energy label in the box

Currently, the requirements for suppliers mandate to provide the energy label in the packaging with the unit. However, heat pumps and air conditioners are typically supplied in combinations. One outdoor unit can be used with several indoor units. One indoor unit can be used with several outdoor units.

In practice, for each combination, an energy label must be generated. In terms of multi-split systems, this number of energy labels increases exponentially due to the number of all possible combinations between indoor and outdoor units as well as the variation in capacity ratios. In order to avoid an overwhelming amount of energy labels in the box, the current regulation has provided some means to simplify that, on the condition that the relevant energy labels are generated for other potential combinations as follows:

- For air conditioners and air-to air heat pumps, a printed label must be provided, at least in the packaging of the outdoor unit, for at least one combination of indoor and outdoor units at a capacity ratio equal to 1.
- For multi split appliances, the information requirements table shall be provided at capacity ratio 1:1.

6. Reconsider the introduction of the compensation method

During the Consultation Forum meeting of 24 June 2022, it was proposed to consider the introduction of the compensation method as part of the review and with a set date. The proposed compensation method has not yet proven to be mature, particularly for air-to-air units and to fulfil its original aims (increased repeatability and reproducibility; testing without intervention from manufacturers; better reflecting real-life conditions; reducing testing time and associated test costs; extending the method to include calorimeter test room and air enthalpy room; etc.). This was the conclusion of the 2020 Consultation Forum on testing and also from more recent findings from BAM RRT.

The latest results shared by BAM still show high deviations between labs and encountered testing issues that cannot always be identified and remedied with certainty. Due to the diversification of data and lack of details, the data does not show enough coherence to create a level of confidence. A higher testing time has been observed and it was also observed that the behaviour of units in the lab is different than how the unit functions in real-life operating conditions. In order to ensure all elements are considered and included, further investigation and analysis must be performed.

To avoid any mistakes in the Regulation of a rushed introduction, the knowledge of experts within standardisation must be considered in this process. At the standardisation level, reflections on a potential testing method that would limit the need to ask the manufacturer to set up the unit for testing and that could be robust and appropriate for large scale testing have just started. Proposing a testing method to support market surveillance authorities that is not yet fit for purpose and does not take into account standardisation expertise will result in unreliability and uncertainty in regard to its application for all stakeholders.

For the above reasons, any consideration of an optional approach or inclusion in the revision clause with a set date is too soon and not appropriate based on the current findings.

7. Exclude data centre cooling from the scope

During the 24 June 2022 Consultation Forum, it was questioned whether data centre cooling (close-control cooling) should be integrated in the scope. Given the changes in test

requirements, which consider comfort, and the fact that these products are working continuously to provide cooling for data centres, which means that a different bin is used to determine the efficiency must be considered, there is a need to further investigate these products. Currently, no standardised testing method exists for such units.

EPEE therefore believes that data centre cooling units should be exempted from both ecodesign and energy labelling and considered in a separate preparatory study.

8. Maintain one sound power instead of two for reversible units

EPEE strongly opposes that two sound power should be provided for reversible units. This creates an unnecessary testing burden without providing any tangible additional benefit to the consumer.

In the current regulation, it is sufficient to declare the sound power in cooling mode for reversible units. This is a realistic approach, as this condition represents higher sound power level than in heating. So, declaring only one sound power in cooling for reversible or cooling only systems is sufficient. Consequently, the Table 18.6 needs to be corrected accordingly.

In addition, the test point for sound for heating only air-to-air heat pumps (P_{ratedh}) needs to be further clarified. This should be in line with EN 12102.

9. Maintain the market surveillance tolerance values of the current regulation

EPEE recommends revising the proposed verification tolerances for market surveillance. To our understanding, there is no evidence that clarifies the lower tolerances compared to the 8 % value in the current Regulation (EU) No 626/2011. Furthermore, the verification tolerances must take into consideration the different testing methods and testing rooms, i.e., calorimeter versus air enthalpy test rooms. The uncertainties of these methods are modified and currently included in EN 14825, different than the findings from the preparatory study, and should be considered in terms of setting the verification tolerances.

The wording is also wrong: “The determined value shall not be more than xx % higher than the declared value.” This should be changed from “higher” to “lower” as in the current regulation text.

Additionally, it is clear what tolerances should be applied to those values included in the tolerance table, i.e., Table 17. However, for those parameters not listed in the table, but which must be declared (as indicated in the product fiche), it should be clear that the uncertainties/tolerances as specified in the harmonised standards (EN 14825) should apply.

We propose clearly to integrate these tolerances in the table based on EN 14825 or to introduce the following:
"*For parameters not listed in Table 17; those specified in harmonised standards are applicable*."

Examples of such declaration points are the capacities and efficiencies at part load conditions A, B, C, D, etc.

Furthermore, it seems there is no value defined for sound power level in Table 17. We recommend adding the following:
"The model of the air conditioner shall be considered to comply with the provisions set out in this Regulation, as applicable, if the sound power level does not exceed more than 2 dB(A) of the declared value."

EPEE is considering an alternative proposal, to be issued later on, in case it is not possible to refer to harmonised standards for the verification tolerances.

10. Adhere to at least two years between publication and enforcement of new rules

The current proposal foresees one year between the publication of the new requirements in the OJEU and start of implementation. This is too short, as products need to be redesigned and retested based on adapted test methods. Furthermore, standards have to be updated on the basis of proposals for considering airflow measurement and the introduction of Control Verification Procedures (CVP).

EPEE strongly recommends increasing the implementation period to at least two years between publication and implementation. The reason for starting the implementation period at the start of the year is related to the seasonality of the market.

Therefore, the entry-into-force and start of application of the ENER Lots 10 and 20 ecodesign requirements will also have to be aligned with the energy labelling requirement timelines. Without an alignment of timelines, an unreasonable burden will be placed on suppliers in terms of short notice follow-ups in which products will have to be redesigned, retested, and new information will have to be added to them.

11. Ensure alignment with the ongoing review of the Primary Energy Factor

The Primary Energy Factor (PEF), used to define efficiency criteria for energy-using products in Ecodesign and Energy Labelling, is currently under revision. EPEE is strongly in favour of a PEF and urges the Commission to introduce the upcoming updated PEF value in the current Ecodesign and Energy Labelling review of ENER Lot 10. The reason for this is that we believe it will avoid the use of an outdated PEF for the coming years, which means that society would have to wait for 8 – 10 years before an updated PEF will be implemented.

Annex I: Technical comments

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
1.	P19	4.2	2	The definition of a heat pump deviates from the current definition in ENER Lot 10: a) it does not specify that it is an air-to-air heat pump. b) The expression “driven by an electric motor” is missing, which is different from the definition for an “air conditioner.” c) The function of dehumidification is not operated at heating mode because relevant humidity is then decreased.	Add “air-to-air room heat pump” and modify a) and b) to align with current definitions and change dehumidification into “humidification.”	
2.	P20	4.2	18	The definition deviates from previous air-to-air air conditioner and bullet a) is not clear: “if combined with the capacity to remove heat from other spaces.”	Align with definition proposed in the ENER Lot 10 revision.	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
3.	P24	14.1	1	The seasonal heating efficiency definition deviates from current ENER Lots 1 (space heaters) and 10 proposals. There is no definition for “useful room heat output” and no explanation on how this will apply to heat pumps.	Align with current Eta definition.	
4.	P25	14.4	22	Empty definition maybe for “fixed heat pumps?”	Add missing definition.	
5.	P25	14.4	27	*“The parameter can also be written as P_d(outdoor temperature; load) as in for example "P_d(27;100%)."* The purpose of adding this sentence to the definition is not clear as the term is not used anymore.	Delete the sentence.	
6.	P26	14.4	37	*“or for fuel room heaters or electric room heaters the nominal capacity.”* This sentence should not be in the room heat pump definition.	Remove the phrase.	
7.	P26	14.4	38	Wrong table reference.	Replace with “Table 14”	
8.	P27	14.5	46	Wrong table reference.	Replace with “Table 23”	
9.	P27	14.5	47	Since the calculation contains also off-mode hours consumption, this should be annual instead of seasonal.	Reestablish annual.	
10.	P27	14.5	50	Replace “heat pump” with “air conditioner.”	Replace “heat pump” with “air conditioner.”	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
11.	P27	14.5	54	"Required cooling load" and "delivered cooling output" are not defined.	Add the following definition: *"Capacity ratio for cooling (CR_c)" means, for fixed RAC and other portable RAC, the part load for cooling ($P_c(T_j)$) divided by the declared cooling capacity ($P_{dc}(T_j)$); and for single duct room air conditioners, the part load ratio for cooling ($P_c(T_j)$ divided by the corrected declared capacity for cooling ($P_{dc\_corr}(T_j)$);* *The calculation is given in EN 14825:2022 under 3.1.15:* $CR = pl(T_j) \times \frac{P_{designc}}{Pdc}$	
12.	P27	14.6	57	The definition is not clear enough.	Add the following definition: *'Season' means a set of ambient conditions, designated as either a cooling season or a heating season, describing per bin the combination of outdoor temperatures and bin hours pertaining to that season;*	
13.	P27/28	14.6	58-59	Wrong table reference in the definition. Additionally, there are two Table 19s in the document.	Correct table numbering in Annex VI and refer to the right tables.	
14.	P28	14.6	60	Definition is for HP, AC, and reversible units.	Remove "evaporator," as the definition is for cooling and heating mode.	
15.	P28	14.6	61	Definition is for HP, AC, and reversible units.	Remove "condenser of the room heat pump," as the definition is for cooling and heating mode.	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
16.	P28	14.6	62	The term is used for both cooling and heating. Additionally, it is not always expressed in percentage of max heat/cooling output.	Add "cooling" and align with the usage of the term in the tables.	
17.	P28	14.6	63	There is no Annex III table XX.	Reference to Table 16, Table 24 (beware: two Table 24s in the document) and table 27.	
18.	P28	14.6	64	Wrong table reference, reference to bivalent temperature, and indication is missing that the given values are the maximum values.	Change the text as follows: *means the combination of requirements for the reference design temperature, the maximum bivalent temperature, and the maximum temperature below which the room heat pump switches off ($T_{hp,off}$), as set out in Annex IV Table 13, Table 18 and Table 23.*	
19.	P28	14.6	66-68	The difference between $T_{hp,off}$ and TOL is not clear. $T_{hp,off}$ is only mentioned in the reference design temperature as Operation limit temperature, while it is referred to as (Tol) in the PIS.	Clarify which term should be used and remove if redundant.	
20.	P29	14.6	87	The definition deviates from current sound power level definition and does not specify the mode in which to measure.	Use the following definition: *'sound power level' means the A-weighted sound power level indoors and/or outdoors measured at standard rating conditions for cooling (or heating, if the product has no cooling function), expressed in A weighted decibels (dB(A));*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
21.	P29	14.6	89	If indoor/outdoor (temperature) condition are varied, volumetric flow would be varied due to variation of condensing / evaporation temperature of refrigerant flow.	Change as follows: *89) "fixed capacity" means a room air conditioner or room heat pump which ~~cannot change the volumetric flow rate of the refrigerant~~ **does not have a possibility to change its capacity***	
22.	P29	14.6	90	Same as above.	Change as follows: *90) "variable capacity" means a room air conditioner or room heat pump the ~~volumetric flow rate~~ **capacity** can be changed or varied in series of two or more steps;*	
23.	P30	14.8	100	Add cooling.	Use the following definition: *'multiple heating or cooling output levels' means that the model offers two or more discrete levels that are selectable by the user for heating output in case of room heater, cooling output in case of room air conditioner, or fan flow rate in case of comfort fan;*	
24.	P31	15.1	Table 6	The symbol for seasonal room heating efficiency is not the correct one in the cells defining the values of each class.	Change as follows: *Seasonal room heating efficiency (ηrh) (%)* *ηr~~s~~,h ≥ 290* *240 ≤ ηr~~s~~,h < 290* *190 ≤ ηr~~s~~,h < 240* *120 ≤ ηr~~s~~,h < 190* *90 ≤ ηr~~s~~,h < 120* *75 ≤ ηr~~s~~,h < 90* *ηr~~s~~,h < 75*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
25.	P32	15.2	Table 7	The symbol of seasonal room cooling efficiency is not the correct one in the cells defining the values of each class.	Change as follows: *Seasonal room cooling efficiency (ηrh) (%)* *η ηrs,c ≥ 550* *395 ≤ ηrs,c < 550* *295 ≤ ηrs,c < 395* *215 ≤ ηrs,c < 295* *160 ≤ ηrs,c < 215* *115 ≤ ηrs,c < 160* *ηrs,c < 115*	
26.	P41-44	16.6		- Adjust scale limits: according to Table 7, Class A for cooling start from 550 % while the labels indicate 460 %. - For cooling mode there is no colder and warmer climate defined to date or in the document, yet values are displayed on the label example.	Remove colder and warmer climate for cooling.	
27.	P42	Energy Labelling design		Like for other labels proposed, model identification is necessary instead of the word reversible.	Add model identification.	
28.	P44	Energy Labelling design		There is only one climate in cooling mode (see above).		
29.	P50	17.1.3	Para. 3	The seasonal coefficient of performance (SCOP) for RAC is established	Change RAC to room heat pump	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
30.	P51	17.1.3	All tables	Table numbering is wrong: Table 19 is placed between Table 13 and Table 14, there is another Table 19 for cooling bins, similarly for Equation 16 between Equation 5 and Equation 6.	Update table and equation numbering and references in text.	
31.	P 51	Reference conditions for RHP	Table 13	In warmer season it is indicated 2 (-1); this is not in line with standards and current legislations.	Replace by 2 (+1) C°.	
32.	P 51	Reference conditions for RHP	Table 13	In colder season it is indicated -22 (-23). At very low temperature, the control of humidity conditions is not possible. That is the reason for why EN 14825 does not specify wet bulb temperature below -10 °C.	Remove (-23).	
33.	P53	17.1.3		P_{tock} does not exist.	Replace P_{tock} with P_{ck}.	
34.	P53	17.1.3	Table 14	H_{off} and H_{ck} for heating only RHP in colder climate have changed compared to the ENER Lot 10 draft proposal.	If this is not intentional, reinstate previous values: H_{off} 2189, H_{ck} 2184 Align also with EN 14825: 2022, which is harmonised with the current regulation Annex ZA	
35.	P53	17.1.3	Equation 10	There is no COPinf in the equation.	Correct the term explanation COPbin, instead of COPinf.	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
36.	P54	17.1.3	Equation 11	The equation used for calculating COPbin for RACs and RHPs in the current document is for air-to-water and water-to-water systems based on EN 14825, product groups that are not within the scope of ENER Lot 10. It is therefore not adapted for A2A systems in scope of ENER Lot 10. Equation 11 $COPbin(Tj) = COPd(Tj) * \frac{CR(Tj)}{(Cdh \times CR(Tj) + (1 - Cdh))}$	See EN 14825:2022: *COPbin(Tj) = COPd(Tj) × (1 - Cdh × (1 – CR));*	
37.	P54	17.1.3	Table 16	How to test max heat output, this is not representative of the operation of HP neither in term of capacity for design nor for sound and will lead to consumer making wrong choices when comparing products.	Remove max heat output condition for load.	
38.	P55	17.2.1		The value for $T_{design,c}$ is stated in Table 29.	It should be Table 18 based on the current document.	
39.	P57	17.2.1	Equation 9	P_{tock} does not exist.	Replace P_{tock} with P_{ck}.	
40.	P57	17.2.1		The equation used for calculating EERbin for RACs and RHPs in the current document is for air-to-water and water-to-water systems based on EN 14825, which are product groups that are not within scope of ENER Lot 10. The equation is therefore not adapted for A2A systems. Equation 11 $EERbin(Tj) = EERd(Tj) * \frac{CR(Tj)}{(Cdc \times CR(Tj) + (1 - Cdc))}$	See EN14825:2022: *EERbin(Tj) = EERd(Tj) × (1 - Cdc × (1 - CR(Tj));*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
41.	P58	17.2.1	Table 24	For a variable capacity unit, the declared capacity for P_{rated} should remain the choice of manufacturers and not "maximum cooling output in this condition."	Remove the load condition requirement.	
42.	P59	17.2.2	Tables 23-25	These tables are not in numerical order: Table 25 is placed before Tables 24 and 23.	Rearrange the tables.	
43.	P59 P61	17.2.2	Table 23	There are several different tables with the same number (23).	Renumber the tables.	
44.	P61	17.2.2	Equation 26	P_{tock} does not exist.	Replace P_{tock} with P_{ck}.	
45.	P66	17.2.3	Equation 24	We do not need the terms H_{to}, H_{sb}, P_{to}, and P_{sb} in the legend as they are not used in the equation 24.	Remove these terms.	
46.	P77	18.5		The revision of EN 14511-3 will be released at the end of 2022. This standard is used to specify or determine several terms (P_{ratedh}, P_{dh}, outdoor air flow rate, COPd, etc.).	Replace EN 14511-3:2018 with EN 14511-3:2022.	
47.	P77		Annex IV,a and Transitional methods under Table 18.5	The table refers to EN 14528:2016 for some items (plh(Tj), Ph(Tj) …) and to EN 14825:2022 for other terms, such as SCOP-SEER. It is better to refer to the latest version of the standard.	Replace all EN 14825 references by EN 14825:2022 and adjust clause numbers accordingly.	
48.	P77	Room heat pumps	Table 18.5	Cdh EN 14511-3:2018, Clause 8.4.3; there is no such clause in EN 14511-3:2018.	Replace by: *EN 14825:2022, Clause 11.5.2*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
49.	P77	Room heat pumps	Table 18.5	SCOP EN 14825:2022, Clause 7.2 - calculation of SCOP, insofar compliant with the approach laid down in this regulation.	Replace by: *EN 14825:2022, Clause 7.3*	
50.	P77	Room heat pumps	Table 18.5	EN 14825:2022 for RHPs: seasonal room heating energy efficiency	Replace by: *Seasonal space heating efficiency*	
51.	P77	Room heat pumps	Table 18.5	Wrong formula in 18-5; Thus, it is wrong to say that $P_{designh}=P_{ratedh}$+elbu(tj)	It should be as follow: If TOL<$T_{designh}$ then at condition E, outdoor temperature is $T_{designh}$ and $P_{designh}=P_{dh}(E)$+elbu(E)	
52.	P78	18 – Annex IV.a	Table 18.5	Test for sound at "highest heat output" is not representative or informative to the end-user. Furthermore, such a test cannot ensure a level playing field, as it is not linked to a capacity from SCOP calculation.	Testing sound in heating mode should be required only for heating only models. For heating only products, maintain current testing condition (no max heat output).	
53.	P78	18.5		The revision of EN 14511-3 will be released at the end of 2022. This standard is used to specify or determine several terms (P_{ratedc}, P_{dc}, outdoor air flow rate, EERd, etc.).	Replace EN 14511-3:2018 with EN 14511-3:2022.	
54.	P78	18.5	Table 18.5	For P_{to}, P_{ck}, P_{off}, etc., refer to EN 14825:2022, Clause 9.1 to 9.4	It should refer to EN 14825: 2022, Clause 12.2 to 12.5 for definitions.	
55.	P78	18.6	Table 18.5	$P_c(Tj)$ = BLc(Tj) , EN 14825, Clause 7.5 and $P_c(Tj)$ = BLc(Tj)*$P_{designc}$	BLc(Tj) is defined as building load curve and is defined in equation 7 as the part load ratio pl(Tj) in Clause 5.6 of EN 14825:2022. So, the equation for $P_c(Tj)$ is stated in 14825:2022 in 5.6 as:	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
					The cooling load $P_c(Tj)$ is determined by multiplying the design load value ($P_{designc}$) with the part load ratio for each corresponding bin. This part load ratio is calculated according to Formula (7): $pl(T_j) = (T_j\text{-}16) / (35\text{-}16)$	
56.	P79	18 – Annex IV.a	18.6	Described conditions are not relevant for cooling (same fan and compressor speed as for P_{ratedh}); re-establish current testing conditions for cooling.	Include that the operating conditioners shall be the standard rating conditions for cooling with capacity as declared by the manufacturer.	
57.	P80	19 – Annex V	19	Rounded value is not enough – same remark applies to P_{ratedc}. In the product fiche, the P_{ratedc} and P_{ratedh} are rounded values.	One digit after the coma would be needed as some products have heating/cooling capacity below 4 kW. If you consider 4.4 kW and 3.5 kW units, both will be declared as being a 4 kW unit. However, the capacity differs by 20 %. This could be very problematic in case of market surveillance, as the capacity at part load are calculated based on $P_{designh}$ and $P_{designc}$. With 20 % difference already on the P_{design}, the tolerance on the etas will be difficult to achieve.	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
58.	P85	19 – Annex V	19.5	Wrong indoor temperature for rated cooling capacity	Replace (P20ºC,100%) with: *(P27ºC,100%)*	
59.	P85	19 – Annex V	19.5	Seasonal energy consumption for cooling is QCE and not QHE.	Replace QHE with QCE.	Same for 19.6.
60.	P85	19 – Annex V	19.5	SEER and SCOP are missing	Add SEER and SCOP for the different climates.	Same for SEER in 19.6.
61.	P85	19 – Annex V	19.5	Equilibrium temperatures for heating and cooling are not relevant for fixed RAC and they are mentioned in the single duct section already.	Remove equilibrium temperature for heating and cooling.	Same in 19.6.
62.	P85	19 – Annex V	19.5	Customer needs P_{design} for the different climates to confirm that it could satisfy house demand.	Remove rated capacity for heating and re-instate $P_{designh}$ for the different climates through the document.	
63.	P85	19 – Annex V	19.5	Add the list of control functions to be selected.	Add the list of control functions.	Same for 19.6.
64.	P85	19 – Annex V	19.5	Unclear why only standby power is listed and in the general section.	Move P_{sb} to product specific parameters and add the other auxiliary consumption P_{ck}, P_{off}, P.	Same for 19.6.
65.	P86	19 – Annex V	19.5	There is no heating capacity or COP at -7 for warmer climate.	Insert (n/a) for warmer climate -7 °C.	
66.	P86	19 – Annex V	19.5	T_{biv}, TOL and electric backup capacity depend on climate	Add T_{biv} and ELb_u for warmer and colder climates.	
67.	P86	19 – Annex V	19.5	What is “temperature heat pump off” and why is it needed for cooling?	Remove “temperature heat pump off” for cooling.	Same for 19.6.
68.	P86	19 – Annex V	19.5	C_{dc} and C_{dh} can be declared by the manufacturer.	Add C_{dc} and C_{dh} for input.	Same for C_{dc} in 19.6.

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
69.	P95	23 – Annex IX	Table 17	Shall not be less than and not be higher.	Replace *"not higher"* with *"not less than the declared value minus X %"*	
70.	P95	23 – Annex IX	Table 17	The capacity for heating efficiency should be based on $P_{designh}$.	Replace P_{ratedc} with $P_{designh}$.	
71.	P95	23 – Annex IX	Table 17	Requested tolerances, especially for cooling mode, are too stringent compared to the defined uncertainties of measurement in EN 14825. The tolerances in the table do not take into consideration the use for the air enthalpy method, which yields higher uncertainties for larger units.	Re-establish previous verification tolerance of 8 % for all capacities.	
72.	P95	23 – Annex IX	Table 17	Tolerances should also be defined for measured data (COP, EER, auxiliary power).	Define tolerances for COP/EER, auxiliary power from EN 14825.	
73.		Based on EN 14825: 2022		Text in work document specifies: *"Values for bins that are not test conditions are calculated on the basis of inter- and extrapolations from the closest known COPbin values derived from the test conditions."*	Clarification is needed as in 14825: 2022: *"The COPbin values and capacity values at each bin, that are not test point, are determined via linear interpolation of the COPbin and capacity values at part load conditions A, B, C, D, E, F, and G, where applicable. Interpolation of COPbin and capacities are done between with the two closest part load conditions (as mentioned in the tables of Clause 6).*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
					The COPbin values and capacity values for bins above D are linearly extrapolated from the COPbin values and capacity values at part load conditions C and D."	
74.		Based on EN 14825: 2022		The described calculations for EER are based on interpolation (between 35 °C and 20 °C) and extrapolation for the bins above 35 °C and below 20 °C: *"Values for bins that are not test conditions are calculated on the basis of inter- and extrapolations from the closest known EERbin values derived from the test conditions." (p. 58)*	The described method in 14825 is different and is described in 5.6 – Calculation of SEERon: *"For bins above test condition A, the same EER values as for condition A are used. For bins below test condition D, the same EER values as for condition D are used."*	
75.		Based on EN 14825: 2022		The operational hours for crankcase heater mode for reversible and cooling only are the same ➔ Table 23, p. 58.	The correct values are in EN 14825:2022 ➔ Annex A, A.3.1.	
76.		Based on EN 14825: 2022		CR value to consider ON/OFF cycling is not defined when calculating COPbin or EERbin using the degradation coefficient.	EN 14825 specifies that if CR = 1 ± 10 %, the target capacity is achieved and the measured EER, COP can be used as COPbin and EERbin respectively.	
77.		Based on EN 14825: 2022		The draft text states: *'Reference design temperature' means the outdoor temperature for cooling ($T_{designc}$) or heating ($T_{designh}$) as described in Annex IV, at which the part load ratio is equal to 1 and which is specific for*	Definitions for $T_{designh}$ and $T_{designc}$ are the ones that applies also to reference design conditions, which is a separate definition of the working document. See definitions below:	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
				each cooling or heating season, expressed in degrees Celsius (°C); Abovementioned is incorrect for $T_{designh}$, especially if T_{biv} is lower than the $T_{designh}$. Instead, use the definitions set in EN 14825:2022 and combine with reference design conditions: *'reference design conditions' means the combination of requirements for the reference design temperature and the temperature below which the room heat pump switches off $T_{hp,off}$, as set out in Annex IV, Table 6;*	3.1.73 on reference design conditions for space cooling ($T_{designc}$): *"temperature conditions at 35 °C dry bulb (24 °C wet bulb) outdoor temperature and 27 °C dry bulb (19 °C wet bulb) indoor temperature"* 3.1.74 on reference design conditions for space heating ($T_{designh}$) *"temperature conditions for average, colder and warmer climates"*	
78.		Based on EN 14825: 2022		Different definition compared to EN 14825: *'switch temperature heat pump off' ($T_{hp,off}$) means the temperature below which the vapour compression cycle of the room heat pump is switched off and heat is only provided by the supplementary heater;*	Applies for hybrid units only that are out of scope of ENER Lots 10 or 20. In EN 14825:2022, it is therefore called $T_{fb,off}$ in the 2022 published edition. See definition below: 3.1.86 on switch temperature boiler off ($T_{fb,off}$) *"for a hybrid unit, lowest outdoor air temperature at which the gas or liquid fuel boiler is not providing any heating capacity as it is switched off by the controls and heat is only provided by the heat pump*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
					Note 1 to entry: Expressed in °C." Based on the whole document, it is concluded that by $T_{hp,off}$ is meant TOL. To avoid ambiguities and possible overlapping with ENER Lot 1 on hybrid heat pumps, it is suggested to remove $T_{hp,off}$ from the regulation and use TOL. In any case the definition overlaps with that for TOL. See 3.1.58 on operation limit temperature (TOL): *"outdoor bin temperature below which the unit will not be able to deliver any capacity and the declared capacity is equal to zero Note 1 to entry: Expressed in °C."*	
79.		Based on EN 14825: 2022		The draft text states: *'thermostat-off mode' means a mode corresponding to the hours with no cooling or heating load whereby the cooling or heating function of the unit is switched on but the unit is not operational. <u>This condition is therefore related to outdoor temperatures and not to indoor load</u>s. Cycling in active mode is not considered as thermostat-off mode;*	Remove the underlined sentence, as this is not in EN 14825:2022. See 3.1.89 on thermostat-off mode: *"mode corresponding to the hours with no cooling or heating demand of the building, whereby the cooling or heating function of the unit is switched on, but is not operational, as there is no cooling or heating demand*	

Nb	Line (e.g., 17)	(Sub)clause (e.g., 3.1)	Para,/ Fig./ Table	Comments	Proposed change	Observations
				That is not always the case and needs to be removed. In tight buildings under winter conditions, if the heat loads generated indoors (office environment) are high, even though outdoor temperature may suggest no cooling is required, in reality the room may require cooling.	*Note 1 to entry: Cycling on/off in active mode is not considered as thermostat-off."*	
80.	P97	23 – Annex IX	Table 38	The units are missing for the "elec.tarif", "annual energy costs" and "product life."	For a better understanding, add the units for each terms, respectively "EUR/kWh", "EUR/yr" and "years."	

ABOUT EPEE

EPEE represents the Refrigeration, Air-Conditioning and Heat Pump industry in Europe. Founded in the year 2000, EPEE's membership is composed of over 50 member companies as well as national and international associations from three continents (Europe, North America, Asia). With manufacturing sites and research and development facilities across the EU, which innovate for the global market, EPEE member companies realize a turnover of over 30 billion Euros, employ more than 200,000 people in Europe and also create indirect employment through a vast network of small and medium-sized enterprises such as contractors who install, service and maintain equipment. Please see our website (https://www.epeeglobal.org/) for further information.