Brussels, 9 October 2019

Air conditioners and comfort fans: Position on the Ecodesign & Energy Labelling proposals

Following the Consultation Forum meeting which took place on 9 September 2019 to discuss the revision of the Ecodesign and Energy Labelling regulations on air conditioners and comfort fans, we call upon the European Commission to take the present paper into consideration.

Cooling our homes contributes to global warming. The increasing frequency of heat waves and rising temperatures have resulted and will further result in a rising number of air conditioner and comfort fan units being put on the market. These contribute to direct GHG emissions from their intensive energy consumption as well as refrigerant leakage which hinder the EU's 2030 climate targets.

Fortunately, both the energy consumption and emissions of CO_2-eq have been reduced significantly due to the combined effect of the implementation of the Ecodesign and Energy Labelling regulations in place. Furthermore, the current review should further unlock an additional 3.5 TWh/year of electricity savings[1] by 2030 as it has been concluded that there is still potential for improved efficiency of heating and cooling. **We are convinced that the newly proposed requirements for air conditioners such as the common energy label scheme for all appliances in scope, the move to seasonal metrics, the resource efficiency requirements, and the proposed ecodesign and energy labelling requirements for comfort fans will set the right way forward. However, we strongly regret to see that the crucial issue of refrigerants has been entirely taken out** from the ecodesign regulation contravening the review clause of the current regulation that aims at assessing the approach to promote the use of low-global warming potential (GWP) refrigerants.

Implementation date and standardisation request

While we understand and **support the need to improve the existing measurement method, its revision should not delay the regulatory process**. We call on the Commission to immediately organise the technical meeting mentioned at the Consultation Forum to provide certainty on the way forward. Time is key to unlock the energy saving potential and hence, we find that the alternative proposed by Germany – in reference to the dynamic method developed by BAM - to revise the standard and implement the revised regulation by 2023 at the very latest is a fair compromise.

Air conditioners

We are convinced that the European Commission should aim at the double benefit of tackling the optimisation of the energy efficiency and the uptake of low-GWP refrigerants together. The comments that follow point in that direction.

Ecodesign

Changes in the metrics

- We welcome the work done with regards to seasonal metrics which better reflect real-life performance as we believe that EER and COP were inadequate indicators for air conditioners

[1] Review of Regulation 206/2012 and 626/2011 Air conditioners and comfort fans. Task 7 report (p. 43). May 2018

in the EU. We appreciate that in the current draft more effort is made to describe what the components of the SEER and SCOP are and how they are compiled, as this information is missing in the regulation in force making it less transparent.

- On the contrary, while we support the change of the metrics to η% in terms of allowing consumers to compare the energy efficiencies of local space heaters ≤50 kW and air-to-air heat pumps ≤12kW, we wonder if such a change will have any impact at the international level as SEER and SCOP are consolidated metrics for air conditioning appliances within other markets. At the same time, it is a concern whether consumers will understand the display on the label of η% values which are more than 100%. The consumer study did not include this metric and hence, consumer understanding of the revised label is yet unknown.

Tighten the efficiency requirements

The preparatory study showed that the difference between the least life cycle cost (LLCC) of the different improvement options is too small, and hence we believe that more stringent efficiency requirements can be put in place.

Cooling capacity	Proposal for revised SEER
Split units < 6KW	7,0
Split units ≥ 6KW	6,5

Table 1: Proposal for the revised energy efficiency requirements for other fixed air-to-air conditioners

Strengthen the sound power levels

Article 7 on the revision of the Ecodesign Regulation stated that the review shall in particular assess the sound power level requirements and, what is more, the preparatory study concluded that there is a slight potential to lower the maximum sound power level requirements. However, the requirements proposed maintain the levels as they have been since 2013, meaning that no improvement will have been implemented for more than a decade.

Topten data (see Figure 1) shows that already today there are units that widely surpass the proposed ecodesign requirements.

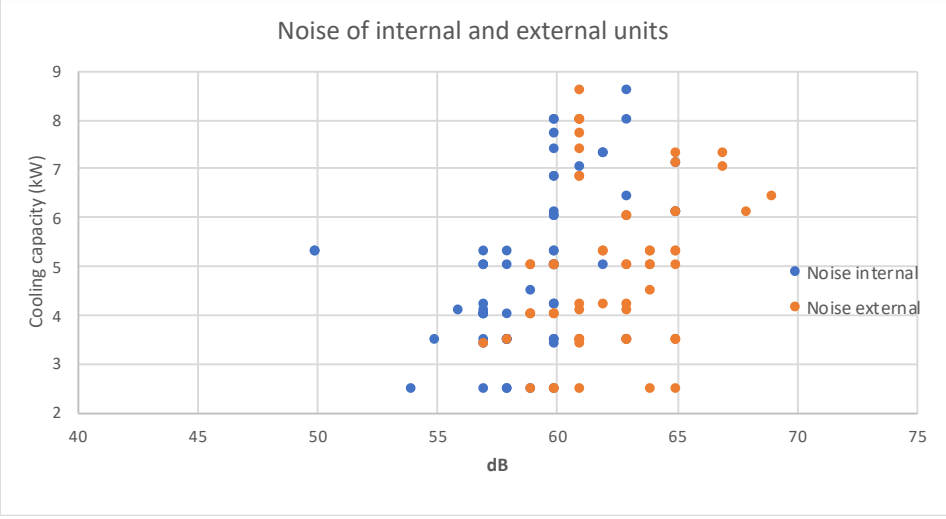

Figure 1. Topten: Distribution of noise value for indoor and outdoor units according to their cooling capacity

Therefore, we believe that the maximum sound power requirements should be more ambitious and changed accordingly. See our proposal below:

Cooling capacity	Sound power level in dB(A)					
	Current regulation		Proposal in the working document		Proposal for new levels	
	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
Split units < 6KW	60	65	60	65	57	60
Split units ≥ 6KW	65	70	65	70	60	63

Table 2: Proposal for the maximum sound power level in dB(A) for split units

Reduce barriers to the uptake of low-GWP refrigerants

Article 7 on the revision of the Ecodesign Regulation stated that the review shall in particular assess the approach to promote the use of low-GWP refrigerants. However, any reference to refrigerants has been deleted from the proposal – including the existing energy efficiency bonus and the information clause. The justification presented is that only the F-Gas Regulation should deal with this issue, and that no manufacturer uses the bonus, which is why its impact has been negligible.

However, we strongly believe that ecodesign is essential to complement the F-gas Regulation as well as to provide a clear market signal which supports and accelerates the implementation of the F-gas regulation. We argue that the fact the bonus was not taken up by industry, suggests the incentive was not strong enough.
While the F-gas Regulation is an example used worldwide for the successful mitigation of HFCs, we believe that the delays in the restriction of certain refrigerants and the uptake of the quota system is taking too much time for a product category where already today good alternatives exist.
Furthermore, according to the review study, 95% of split products still used R410A in 2016. Likewise, in the case of portable units only one company currently offers a model which is compatible with the 2020 ban (lower than GWP 150). Thus, for both product groups, the conversion to low GWP refrigerants has been slow even though alternatives are technologically feasible and on the market. Prolonging the conversion of the market to low GWP until the “last minute” may bring a number of risks:

- High GWP refrigerants will continue to be used in increasing volumes for air conditioning for the coming years
- As noted in the review study (Task 2, p.35), slow conversion for portable units means a lack of availability of propane compressors – therefore, propane will not be adopted widely and HFC/HFO alternatives with higher GWP will persist.
- The rapidly growing stock of ACs using R410A will condemn consumers to high costs for service and maintenance as this refrigerant becomes increasingly scarce according to the F-gas regulation. In some cases this may result in costly or premature replacements of their units, representing an additional cost.

It should also be noted that explicit timelines for high GWP refrigerants only apply to movable and single split air conditioning units. This means that other formats, such as multi-split, are only addressed by the overall quotas for hydrofluorocarbons in the F-Gas Regulation.

We propose the following options to be considered:

- We call on the European Commission to urgently **reinstate the information requirement in force already today as part of the product fiche**, and which has been taken out from the revised draft.
  Additionally, we propose to **improve the wording of the clause** and to also reflect the new regulation on commercial refrigeration concerning the **mentioning of the refrigerant charge**.

"Without prejudice to Regulation (EU) No 517/2014 of the European Parliament and of the Council, for air conditioners equipped with a heat pump, the name, GWP and charge of the refrigerant used and a standard text as follows:
'Refrigerant leakage contributes to climate change. Refrigerant with lower global warming potential (GWP) would contribute less to global warming than a refrigerant with higher GWP, if leaked to the atmosphere. This appliance contains a refrigerant fluid with a GWP equal to [XXX]. This means that if 1 kg of this refrigerant fluid would be leaked to the atmosphere, the impact on global warming would be [XXX] times higher than 1 kg of CO_2, over a period of 100 years. Never try to interfere with the refrigerant circuit yourself or disassemble the product yourself and always ask a repairer.'"

- To introduce a **malus scheme on the energy efficiency requirements to penalise those appliances using refrigerants with the highest GWP allowed in the market**. Based on the "polluter pays" principle appliances using refrigerants of GWP>150 should have a 10 to 15% malus on the energy efficiency requirements from the entry into force of the Ecodesign Regulation to steer the market towards the use of refrigerants with reduced harmful impact on the environment.
  As of 1 January 2020, refrigerants with a GWP more than 150 will have been phased out for movable room air conditioning equipment, the malus could then apply to refrigerants with a GWP equal 3 and above in a proportionate manner. Similarly, in view of the ongoing revision of IEC 60335-2-40, we could soon expect new safety requirements that allow the use of low-GWP (GWP ≤ 3) also in single split air conditioning units.
  We are convinced that such provisions in the Ecodesign Regulation will strengthen the effectiveness of the F-gas regulation.

- To **include a pictogram in the energy label indicating if a product contains a natural refrigerant and/or lower-GWP (GWP ≤ 150) or a higher-GWP refrigerant (GWP > 150)**. It is our opinion that the refrigerant information label required by Regulation (EU) 517/2014 on fluorinated greenhouse gases does not properly reach consumers due to the fact that it is displayed on parts of the product that are not visible. Hence, consumers are unlikely to receive any information to allow comparison with more environmental friendly appliances.

- **Restriction of use of HFOs**. These refrigerants – which are not covered by Annex I of the F-Gas Regulation nor affected by the Kigali Amendment to the Montreal Protocol - do not have an ozone depletion potential and some of them have the same order of magnitude as that of natural refrigerants such as CO_2 or Hydrocarbons. However, HFOs pose substantial potential risks which should not be neglected. These can include environmentally harmful and toxic by-products on production and decomposition, environmental persistence, toxic flammability and potential recycling challenges.[2]

Reinforce requirements on resource efficiency

Circular economy, resource savings and savings on embedded energy and CO_2 are clear priorities of the EU. They have been assessed necessary to reach our climate goals as set in the EU long term

[2] On environmental impacts of HFOs and their byproducts see for instance:
https://eia-international.org/wp-content/uploads/2019-High-Stakes-Spreads.pdf
https://www.kth.se/en/itm/inst/energiteknik/forskning/ett/projekt/koldmedier-med-lag-gwp/low-gwp-news/potentiella-faror-med-trifluorattiksyra-tfa-1.602615
Scientific Assessment Panel (2018). Scientific Assessment of Ozone Depletion of The Montreal Protocol , page 6 and 40

decarbonization strategy for 2050. We therefore call on the European Commission and the Member States to take ambitious action through the ecodesign policy as follows.

Strengthen provision on spare parts

Availability of spare parts is a key material efficiency consideration, and we urge the Commission to introduce ambitious provisions on spare parts availability as described below:

- all spare parts should be available **during at least the average product lifetime**, i.e. 12 years after the last unit is supplied. As a minimum, these should be available for 10 years, in line with the Austrian standard ONR 192102.

- the **list of spare parts should be extended** to also include:
  - **buttons,**
  - **remote controls,**
  - **filters, and**
  - **outside housing.**

- Access to certain spare parts (such as remotes, filters and housings) **should not be restricted to professional repairers but should also be open to end users.** This is because certain maintenance and repair operations can be carried out with little technical ability. In general, greater clarity is needed on how professional repairers are defined. It is crucial that such a registry is not defined in a way that would exclude credible repair actors (e.g. independent repairers, repair cafes, and social enterprises). We call on European decision-makers to remove barriers to repair, by giving access to repair information and spare parts to all types of repairers. The repair market must not be distorted through unnecessary restrictions of the availability of information and spare parts. Should it be decided to maintain the concept of professional repairers, we request that Member States have the proposed official registration systems set up before the entry into force of the repair requirements. The maximum information that manufacturers or national registers can require from repairers should be defined in order to ensure that there are no disproportionate barriers to access such a status:
  - **Technical competence**: It should be specified that a self-declaration from the repairer stating that they have the technical competence to carry out the repair is sufficient. Further optional information can be requested from the repairer to i) state their compliance with the applicable regulations for repairers of electrical equipment in the Member States where they operate, and ii) to provide reference to their professional repairer registration in an official system, where such system exists in the Member States concerned, but the absence of this information shall not prevent the recognition of the repairer as professional.
  - **Liability insurance**: It should be specified that a self-declaration from the repairer which states that they have appropriate insurance to cover liabilities resulting from their activity regardless of whether this is required by the Member State is sufficient.

  It is also important to clarify the basis upon which national registries, manufacturers, importers or authorised representatives can accept or refuse the registration.

- Manufacturers, importers or authorised representatives shall ensure that the spare parts mentioned in points (a)(1) and (a)(2) can be replaced with the use of **commonly available tools**[3] and without permanent damage to the appliance – ease of disassembly should not only be limited to the end-of life actions for WEEE.

[3] Commonly available tool should be defined in line with the basic tools class, Class A (or at least Class B) of prEN 45554 Annex 4.4

- A maximum delivery time of **one week** for spare parts should also be introduced.

Target disassembly not only ease of dismantling

Regulations should set requirements for ease of non-destructive disassembly, not only ease of dismantling, as this is a big step backwards in terms of reparability of products. Additionally for air conditioners equipped with a heat pump, it shall be possible to disassemble the device to access all components in order to ensure the maintenance and servicing of the heat pump as well as the verification of leaks. We call on EU decision-makers to respect the waste hierarchy and reinstate the objective to facilitate repair through simpler design.

Set a requirement on maintenance

During the maintenance of the air conditioner, if the circuit is sealed, the only way to work on the appliance is by letting the refrigerant escape. There should be a clause requiring that it is possible to contain the refrigerant on one side of the circuit so that work can be performed on the other side without any leakage.

Add to the relevance of LPM and include networked standby

It is our opinion that currently, the consumption of the low power modes (LPM) within the appliances is given a negligible weight within the overall energy consumption calculation. Given that some figures show that the average standby consumption of an air conditioning device can reach up to 10W, we believe that **the relevance of the LPM within the calculation needs to be increased**. In addition, **absolute standby consumption requirements should be included**.

Furthermore, **it is essential that the networked standby is also accounted for** in the energy consumption calculation as this mode will undoubtedly gain presence within the units.

Define verification tolerances for all the measured parameters

We find it positive that most of the verification tolerances have been reduced. It is our view that as the quality of test methods improves, this can be reflected in tighter tolerances. The improvement of the quality of test methods will provide more accurate information to consumers via the energy labels.

At the same time, some tolerances are missing e.g. for the sound power level, for the SCOP on portable appliances, etc. and need to be determined in the regulation to enable market surveillance verification.

Definitions need more clarity

The draft should clearly define what the term “fixed” means for single duct and double duct appliances. While fixed double duct appliances exist on the market, there is still not enough clarity regarding “fixed single duct” appliances.

Energy Labelling

No protection of inefficient technologies

We strongly welcome the proposed common label scheme for all air conditioning appliances. It is our opinion that the new proposal improves the situation regarding the protection of inefficient technologies such as the local air coolers (LAC). LACs are problematic products, they require a window or door to be left open, thus deteriorating the efficiency of the system. They are often an impulse purchase and the consumer does not necessarily get proper advice from retailers (in opposition to room air conditioners, where, generally, an installer may ensure a well-fitted and designed installation). Treating local air coolers separately as it is the case with the regulation in force means giving them an advantage, an approach we refuse to accept. The energy label should bring transparency and allow consumers to compare the efficiency of single and double duct to room air conditioners.

While it is acknowledged that in some limited cases double-duct, portable and single-duct maybe the only options available to consumers (e.g. due to local building requirements for historic buildings), these technologies are significantly less efficient than split units. For these product categories, a low score on the energy label will inform consumers that these are inefficient products and that their usage should be minimised accordingly. For example, a portable unit is not suitable for sustained periods of cooling and bring about significant costs to consumers. In the absence of a combined label, it would be unacceptable and misleading for consumers if some products in these categories were to achieve an A class. As it stands, consumers are unable to learn from the label that an A class single/double duct corresponds to class F of split room air conditioners – 50% less efficient![4]

Redefine the energy efficiency classes

As mentioned above, we firmly support the Commission's proposal of a common label for all the air conditioners. However, we hereby propose how to further improve the proposal:

- We are glad to see that the proposal provided for the future energy label for air-to-air air conditioners within the working documents has been adjusted to reflect the Best Available Technology (BAT) described in the preparatory study. Class A should be empty as required in the revised Energy Label Framework Regulation and the BAT situated in Class B.
  However, according to our analysis, by January 2022 the ecodesign requirement as proposed for air-to-air conditioners, classes E and F would already be empty and class D would be only slightly populated. This is a clear indication of the need for better consistency between the energy label and the ecodesign requirements to avoid empty bottom classes soon after the proposed requirements enter into force. We therefore strongly recommend **revisiting the classes B to G in order to maximise the use of all the energy classes and propose a more even bandwidth** to ultimately avoid the risk of quickly squeezing the market for split units into the top classes as this would undermine the value of the energy label as a tool for consumer choice.

Energy efficiency class	$\eta_{s,c}$ (%)
A	$\eta_{s,c} \geq 550$
B	$478 \leq \eta_{s,c} < 550$
C	$407 \leq \eta_{s,c} < 478$
D	$335 \leq \eta_{s,c} < 407$
E	$264 \leq \eta_{s,c} < 335$
F	$192 \leq \eta_{s,c} < 264$
G	$\eta_{s,c} < 192$

Table 3: Proposal for the revised energy efficiency classes

- Regarding the industry's concern about the lack of incentives through the combined energy label for the portable appliances - that will be restricted to class G for obvious reasons mentioned above - we reiterate that the main concept of the label is to act as a key driver for

[4] http://www.topten.eu/uploads/File/Aircon_recommendations_April_2014.pdf

helping consumers choose products which are more energy efficient. Additionally, the η% value that will be displayed on the energy class may serve as an indication for product differentiation and allow comparison between appliances.

- Concerning the energy efficiency classes of air-to-air heat pumps, it is our position to align with the classes for the comparison of the heating functions of local space heaters and air conditioners below 12kW by **combining their labels provided the electric heaters are also included in the same label scheme**.

- For every other review adopted so far, the indication in kWh/annum has been dropped due to the fact that consumers do not necessarily understand the metric and because the annual energy consumption is too much dependent on user behaviour and conditions. It is therefore questionable to see that for these labels, the Commission is still proposing to keep the annual energy consumption indication in kWh/annum. It would seem logical to replace it also here by an energy consumption per duty cycle, e.g. kWh/60min, or kWh/day or kWh/30 days.

Separate noise scales on the label for indoor and outdoor

Topten data (see Figure 1) shows that indoor units are significantly less noisy than outdoor units. It also shows that larger capacities tend to be noisier, but the correlation is very weak because the data is very dispersed. Furthermore, the proposed classes show that class A would be empty and class B would be almost empty while leaving most indoor and outdoor units in classes C and D. Thus we believe that by keeping separate scales for the classes of indoor and outdoor units would allow for better product differentiation by optimising the use of all the four classes. Here is our proposal:

Energy Efficiency Class	Sound power (dB(A))
A	< 45
B	≥ 45 and < 50
C	≥ 50 and < 55
D	≥ 55

Table 4: Proposal for revised maximum sound power level classes for indoor units

Energy Efficiency Class	Sound power (dB(A))
A	< 48
B	≥ 48 and < 53
C	≥ 53 and < 58
D	≥ 58

Table 5: Proposal for revised maximum sound power level classes for indoor units

Test settings into EPREL

It is our opinion that the test settings by manufacturers should be included into the compliance part of the EPREL database to be used by market surveillance authorities.

Improve the label design

- We are concerned about the pictogram for heating and cooling. It is our opinion that the pictogram might be confusing on whether they refer to indoor or outdoor conditions.

- We regret that no icons have been envisaged that could help consumers buy more durable, reparable products, such as the free warranty period offered by the manufacturer or spare parts availability. DG Justice's behavioural study on consumer engagement in the circular economy describes how effective this could be in shifting purchasing decisions towards products with greater durability and reparability.

Comfort fans

We strongly welcome the ecodesign and energy labelling requirements proposed for comfort fans. This means that consumers will now be buying comfort fans with the knowledge of their energy consumption and being able to compare the different fans based on the information on the label.
We hereby provide a number of suggestions on how to further improve the current proposal:

Extend the scope to include tower fans and fans <20cm

The draft should explicitly include in its scope or at least make it clear within the applicability of the ecodesign and energy labelling requirements that the following products are also considered:

- **Tower fans**. These fans represent a large share of the fans on the market. Some of the most popular fan models nowadays are tower fans. The proposed requirements however, do not explicitly address these types of fans since the ecodesign requirements are defined on a diameter-basis. We call on the Commission to clearly identify the specific requirements that apply to tower fans in order to avoid loopholes.
- **Fans with a diameter that is smaller than 20cm**. As in the case of tower fans, the proposed requirements do not explicitly identify smaller fans. We therefore call for clearer provisions to also cover these fans by the requirements.

Reinforce ecodesign and energy labelling requirements

- We believe that the **Service Value is a good value to use to assess the energy efficiency** because it also assesses the effectiveness of the fan (ability to move a maximum amount of air). This will not only lead to improvements in the electrical components (motor) but also in the design of the blades of the fan.

- Tower fans and fans with a diameter of less than 20 cm are not subject to any MEPS while ceiling fans starting from 0 cm do have MEPS associated to them (i.e. 0.5). We call on the Commission to also **define MEPS for tower fans and fans with a diameter under 20 cm** in order to close any potential loopholes.

- It is suggested that the **fan blade be also included in the list of spare parts** in addition to the fan motor. Oscillation mechanisms commonly fail too. Additional spare parts for ceiling fans may be considered, especially where these include light fixtures.

- We believe that the proposed subdivisions for the MEPS can be simplified. The data from Topten shows that small changes in the diameter do not significantly influence the Service Value; the Service Value is rather influenced by the fan type (ceiling or standing).
  It should also be noted that the value proposed specifically for fans with a diameter ≥40 and <50 (i.e. 1,08) and the value for fans with a diameter ≥50 and <60 (i.e. 1) are not consistent with the rest of the values in the table which increase with the diameter.
  Based on the research of the market, **we propose the following simplified MEPS for comfort fans:**

	SV (m^3/min)/W
All comfort fans, except ceiling fans, with a fan diameter ≥ 0 and < 30 cm	0,5
All comfort fans, except ceiling fans, with a fan diameter ≥ 30 and < 60 cm	1,08
All comfort fans, except ceiling fans, with a fan diameter ≥ 60 cm	1,3
Ceiling fans, with a fan diameter > 0 and < 90 cm	2,6
Ceiling fans, with a fan diameter ≥ 90 and < 150 cm	3,4
Ceiling fans, with a fan diameter ≥ 150	4,3

Table 6: Proposal for revised minimum service value for comfort fans

- We request that **standby and off-mode consumption requirements are set also for comfort fans**. The trend under the horizontal regulations on standby and networked standby modes could facilitate to unlock the improvement potential to achieve lower power consumption in low power modes.

Editorial comments

Doc	Page		Comment
ED Annexes	6 (68)	'building load curve' ($BL(T_j)$) means the rated capacity multiplied with the outdoor…	The term "rated capacity", does it refer to "cooling capacity" instead?
ED Annexes	9, Table 6	Minimum sound power requirements	It should be maximum sound power requirements
ED Annexes	14 (2d)	$Q_{CE} = Q_C / SEER_{on} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}$,	Add parenthesis in the formula to avoid any arithmetic mistakes and for more clarity. Same for SCOP.
ED Annexes	8	$\eta_{s,c}$[1] in %	The footnote is missing
EL Annexes	14		The annotations for pictograms for the label do not necessarily match the numerals

END

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