Brussels, 29 November 2019

Vacuum cleaners:
Position on the Ecodesign & Energy Labelling proposals

We thank the European Commission for the Ecodesign and Energy Labelling proposals on vacuum cleaners, and the opportunity to discuss them during the Consultation Forum on 30 October 2019. While we acknowledge that there are some uncertainties and technical difficulties, we would like to suggest the following possible way forward:

1. Revising the Ecodesign regulation and adopting a new Energy label for vacuum cleaners now. The regulations would use a simplified annual energy consumption formula which is independent of cleaning performance, and would take into account the provisional partly-loaded test method.

2. Consider all other changes to the vacuum cleaners performance standard (e.g. inclusion of debris and fiber pick-up, three double strokes instead of five, etc.) in the next revision of the regulations.

We believe this approach has several important benefits:

- It allows the European Commission and Members States to move forward without having to wait for a complete revised standard,

- It preserves coherence (both in terms of content and timing) between Ecodesign and Energy Labelling,

- It delivers most of the potential environmental benefits identified by the consultants.

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Expand scope to include robots and handheld vacuum cleaners

Expanding the scope to include these products will ensure that, at the very least, easy-to-obtain environmental benefits from standby, resource efficiency and information requirements are gained. For robots, we know from the preparatory study that these benefits are large. For handheld vacuum cleaners, although the benefits have not been quantified[1], we see no justified reason to exclude them, in particular when considering their vast market share[2]. The trend among manufacturers towards handheld devices is clear and the regulation should reflect that.

Additionally, we welcome the inclusion of commercial vacuum cleaners as this will deliver additional savings and benefits to users.

Make annual energy consumption independent of cleaning performance

We suggest simplifying the formula to remove any "correction factors" linked to dust or debris pick-up. For **mains-operated vacuum cleaners**, the annual energy consumption would be calculated as follows:

$$AE = 4 \times 87 \times 50 \times 0{,}001 \times ASE$$

where:

- *4 is the standard number of times that a vacuum cleaner passes over each point on the floor (two double strokes)*
- *87 is the standard dwelling surface to be cleaned in m^2*
- *50 is the standard number of one-hour cleaning tasks per year*
- *0,001 is the conversion factor from Wh to kWh*
- *ASE is the average specific energy consumption in Wh/m^2 during test*

A similar rationale would be applied to **cordless vacuum cleaners**. The only significant difference in the formula would be the addition of the annual energy consumption in maintenance mode:

$$AE = 4 \times \left(\frac{87}{4}\right) \times 200 \times 0{,}001 \times ASE \times + \frac{M_h \times 8026}{1000}$$

where:

- *M_h is the power consumption in maintenance mode in W*
- *8026 is the annual number of hours spent in maintenance mode*

For **robots**, the annual energy consumption formula would also take into account the different usage pattern: once a week for 2 hours, with 8445 hours in maintenance mode[3]. The test method could be a

[1] Our comments of 1 February 2019 on the draft final report already called for an evaluation of the environmental impact of handhelds: *"While these may look small and harmless to the environment, one should investigate how much energy and resources are needed to manufacture, power and dismantle the millions of handheld VCs that currently exist in Europe, and what improvements would be feasible by regulating them under Ecodesign/Energy Labelling.*

[2] 25 million of them sold in 2015, as opposed to 30 million mains-operated VCs, 3.5 million cordless and 1.5 million robots. See page 97, figure 27, of the final preparatory study.

[3] Page 36, figure 5 of the final preparatory study.

transitional one based on what consumer organisations currently use[4]. Considering that M/540 adopted in 2015 already called for the revision of the standard to cover also robots we deem the lack of a standard as a weak argument not to implement this requirement.

$$AE = \left(\frac{Emeasured}{RCF \times 20}\right) \times \left(\frac{87}{4}\right) \times 200 \times 0{,}001 \times ASE \times + \frac{M_h \times 8445}{1000}$$

where:

- *$E_{measured}$ is the output from the test method, i.e. measured re-charging energy after cleaning the 20 m^2 test room*
- *RCF is the Room Coverage Factor*
- *M_h is the power consumption in maintenance mode in W*
- *8445 is the annual number of hours spent in maintenance mode*

Do not favor battery-operated vacuum cleaners

Generally speaking, battery-operated vacuum cleaners have a higher environmental footprint than mains-powered ones, both in terms of energy efficiency and material efficiency, due to charging/discharging losses and to the inherently limited lifetime of batteries. Requirements should not be adapted in order to artificially bring battery-operated vacuum cleaners up to the same level, as this would incentivise a technology that is less sustainable. Instead, battery-operated and mains-powered vacuum cleaners should be evaluated to the same standards.

We therefore call for the removal from the regulation of the current allowances for lower filtration levels, higher noise levels, and shorter availability of spare parts for battery-operated vacuum cleaners compared to mains-powered vacuum cleaners.

Test in partly-loaded conditions

Standardisation bodies have made good progress on how to define and test in “partly-loaded” conditions. The proposed solution entails manufacturers declaring the Maximum Usable Volume (MUV), then using a fraction of the MUV (e.g. half of it) for the relevant tests. We suggest that the European Commission takes into consideration these developments, where possible: performance parameters such as the annual energy consumption should be calculated – in part or exclusively - in partly-loaded conditions.

Set the date of application in 2022

The analysis from the consultants considered 2021 for the application of the revised requirements. While this might now be difficult to achieve due to the accumulated delays, it is important that the revised Ecodesign and Energy Label regulations enter into force and is applied as soon as possible. We believe that 2022 is a feasible date for application, provided the European Commission moves forward quickly with the regulatory process.

Test in the same mode

We welcome the wording *“The specific energy consumption, the cleaning performance and the dust re-emission shall be measured concurrently.”.*

Tolerances

We welcome the decrease of some of the verification tolerances in annex IV. We do not support the increase of the dpu_c and dpu_{hf} verification tolerances, as it provides a disincentive to reduce the uncertainty.

[4] Which ? in the UK and Stiftung Warentest in Germany test robots for their performances

▪ *Recommendations for Ecodesign*

The table below summarises the suggested Ecodesign requirements:

Parameter	Measurement unit	household (mains) VC*	cordless (battery) VC	robots
annual energy consumption	kWh/year	***33,00***	***33,00***	***33,00***
maximum operating power	W	***750***	***750***	***750***
dust pick up carpet		***0,80***	***0,80***	***0,80***
dust pick up hard floor		0,98	***0,98***	***0,98***
debris pick up carpet**		0,70	0,70	***0,70***
debris pick up hard floor**		0,75	0,75	***0,75***
dust re-emission	%	0,80	***0,80***	***0,80***
sound power level	dB(A)	***80***	***80***	***80***
motion resistance	N	40	40	
operational motor lifetime	hours	550	***550***	***550***
durability hose	oscillations	40 000	40 000	
battery lifetime	cycles		600 @70%	600 @ 70%
off mode	W	***0,50***	0,50	0,50
standby mode	W	***0,50***	0,50	0,50
maintenance mode	W		0,50	0,50
standby mode with info	W	***1,00***	1,00	1,00
maintenance mode with info	W	***1,00***	1,00	1,00
standby mode with networked standby	W	***2,00***	2,00	2,00
maintenance mode with networked standby	W	***2,00***	2,00	2,00

** **Italics** for parameters that differ from those in the draft working documents*

*** Only if test methods are available by the time of entry into force of the regulations*

Further rationale for the parameters in this table is provided in the recommendations below:

Tighten dust pick-up requirements

We suggest setting a minimum dust pick-up (dpu) requirement of 0,8 for carpet vacuum cleaners, and 0,98 for hard floor. This ensures that all vacuum cleaners have a good minimum cleaning performance. This would leave relatively little room for differentiation on cleaning performance, and therefore *dpu* can be removed from the label (see section on the energy label below). This approach is similar to what has already been done successfully for instance, in the case of the washing performance.

Adjust annual energy consumption requirements

We suggest tightening the annual **energy consumption requirement for mains-operated vacuum cleaners** from 36 kWh (as suggested by the consultants for Policy Options 1 and 3), to **33 kWh**. This adjustment is needed because **removing the correction factor would mean an implicit weakening of the annual energy consumption requirement[5] of 8%**, which would need to be compensated by a stricter Ecodesign limit.

[5] The calculated annual energy consumption would be between 10% (dpu_c = 0.92) and 25% (dpu_c = 0.8) lower for carpet; and between 2,50% lower (dpu_{hf} = 0,98) and 13.75% higher (dpu_{hf} = 1.11), according to our calculations. Considering half and half of carpet and hard floors as in the current regulation, the energy requirements would need to be tightened by: 0.5*(25%-10%)/2+0,5*(-16.25%-2.50%))/2 = 8%. From 36 kWh to 33 kWh, that is.

In order to provide a level playing field for products that provide the same service, the requirement on the annual energy consumption for **cordless vacuum cleaners and robots should also be set at 33 kWh/year.**

These stricter Ecodesign requirements are crucial to grasp the savings potential of vacuum cleaners, and to help the European Commission and Member States deliver on its climate and energy targets. In addition, these come at no additional cost to the consumer in terms of life-cycle cost (LCC).[6]

Tighten the power cap

A power cap limit of 750W is also suggested by the consultants for policy options 1 and 3. However, if there is a switch from "rated input power" to "maximum operational power" the power cap would be *de facto* tightened, and the 750W cap could be somewhat relaxed. If the concept of "maximum operational power" is applied, this should be precisely defined in the regulation as the phrase in itself does not refer in a sufficiently unambiguous manner to power input as opposed to power output.

Define comprehensive low-power modes requirements

We support the inclusion of low-power modes requirements for mains-operated and cordless vacuum cleaners. These requirements should also be extended to robots and handheld VCs in Annex II, point 3 of the Ecodesign working document.

In addition, there should also be measures to ensure that cordless and robots do not consume energy when not in "active" use. These could take the form of:

- a requirement for a "hard switch" that allows the user to turn the device completely off (zero energy consumption) without having to unplug it, or
- a requirement for the device to switch automatically to off mode (zero energy consumption) a number of minutes after recharging is complete.

An alternative can be to offer manufacturers the possibility to use the number of hours that the products *actually* spend in maintenance mode in the annual energy consumption formula. Cordless vacuum cleaners and robots that do provide the energy saving functions mentioned above would have considerable lower hours in maintenance mode than the default values of 8026 for cordless and 8445 for robots, and therefore lower annual energy consumption.

These low-power mode requirements should be a priority as they provide considerable savings and are easy to implement.

Strengthen resource efficiency requirements

Material and embedded energy savings are clear priorities of the EU. They are necessary to reach our climate goals as set in the EU decarbonisation strategy for 2050. We therefore **support the inclusion of resource efficiency requirements for mains-operated and cordless vacuum cleaners, and request that these requirements are also extended to robots and handheld VCs** in Annex II, point 4.

A way to improve the lifetime of household appliances is to design products that are easier and less costly to repair. We therefore put forward the following points for improvement of the draft Ecodesign Regulation.

[6] Page 284, figure 83 of the final preparatory study.

Strengthen provisions on spare parts

Availability of spare parts is a key consideration towards resource efficiency, and therefore we urge the Commission to introduce ambitious relevant provisions as described below:

- Align requirements for the **availability of spare parts to a common period of 8 years for all products covered under the regulation**: mains-operated, cordless, commercial, and cordless vacuum cleaners, robots and hand-held. This will also allow for more consistent wording compared to the current draft, as the different way in which the availability timeframe is currently worded for availability to professional repairers on the one hand, and professional repairers and end-users on the other hand, is confusing.

- Require **availability of spare parts as soon as the product is placed on the market**. While the legal guarantee may seem to make the availability of spare parts superfluous in the first two years, this is actually not the case. During the first two years following purchase, vacuum cleaners may also get damaged accidentally in ways that would not be covered by the guarantee. In such cases, it is just as vital that a repair option is available as after two years.

- The **list of spare parts should be extended** to also include other commonly failing spare parts such as **switches, motors, circuit boards, power cables and cable retraction systems, fittings, wheels, brushes and casings**.
  The specific list **for robot vacuum cleaners** should also include **batteries, docking station, sensors, HEPA filters, brushes and side brushes**.
  Furthermore, access to certain spare parts should not be restricted to professional repairers but should also be open to end-users.

- A maximum delivery time of **one week** for spare parts should also be introduced. It should be noted that for this specific product, there is a high risk that consumers will decide to purchase a new appliance should the repair process be too lengthy.

- In general, greater **clarity is needed on how professional repairers are defined**. It is crucial that 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 and not distort the market through unnecessary restrictions. This could be done by including repair information, fault diagnosis functions and spare parts references into the printed circuit boards and the user guide.

  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. In order to ensure that there are no disproportionate barriers, the maximum information that manufacturers or national registers require from repairers should be defined on the basis of:
  - **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) provide reference to their professional repairer registration in an official system, where such system exists in the Member States concerned; however, not being referred to in these systems (which could be

the case for repairers working exclusively with waste or donations) 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.

- Lastly, the **concept of reasonable fees should be defined in a more precise and encompassing manner**. The current wording is insufficient, as even fees that do take into account the extent of usage of the information could still be unreasonably high. In order for a fee to be reasonable, it should be proportionate to the preservation of product value that can be achieved through the repair that is enabled by the concerned information. Otherwise, consulting the information in order to repair a product is not economically viable.

Mandatory requirement for recycled content

In a circular economy, all products should include a minimum amount of recycled content to maintain material value as long as possible within the economy and avoid the use of virgin natural resources. Recycled content in products can indeed help reduce pressure on natural resources, support the market for secondary raw materials and preserve embedded energy as part of circular value chains. Therefore, **a mandatory minimum recycled content for plastic parts should be systematically introduced into Ecodesign regulations** and similar product legislation.[7]

At the very least, a first tier should be set obliging to provide information on recycled contents. Then an eventual second tier could consider quantitative targets.

Restrict halogenated flame retardants

Many substances widely used in electric and electronic products are hazardous, resulting in negative environmental and human health impacts. Additives and impurities in a material can create a barrier to circularity both because they can reduce the quality of recyclates and because the presence of hazardous substances may limit the potential for secondary applications.

Using Ecodesign to regulate the use of hazardous substances in products is explicitly proposed as a policy option to support circularity in the Communication on the implementation of the circular economy package: “options to address the interface between chemical, product and waste legislation”.[8]

This option has already been applied in the new requirements for electronic displays where halogenated flame retardants have been restricted from the stand and casing. The European Commission estimate that this measure will enable 84,000 tonnes of plastic to be recycled which would otherwise have been incinerated. Other benefits, including reduced human and environmental exposure to hazardous chemicals, as well as its contribution to increased public confidence in recycled products have not been assessed. We believe this sets an important precedent which should be applied in other product groups.

Vacuum cleaners present such a product group where a similar provision should be included to unlock further material savings and contribute to wider circularity objectives. Flame retardants are commonly

[7] “For better not worse: Applying ecodesign principles to plastics in the circular economy” ECOS, June 2019
[8] See Option 5a under “Design for Circularity” SWD(2018) 20 final
https://ec.europa.eu/docsroom/documents/27321/attachments/3/translations/en/renditions/native

used in the motor cover of vacuum cleaners, but also sometimes also in the housing, the cord rewinding wheel as well as other components. Even in the case of the motor housing which may reach the highest temperatures (200˚ C) in the appliance alternative flame-retardant free materials are available and currently on the market[9].

We strongly suggest that flame retardants are restricted for all vacuum cleaner housings – as measure to support both design for circularity and consumer safety. Given that household mains operated vacuum cleaners alone have on average 3.6 kg of bulk plastics per unit (with most of this currently going to landfill or incineration), and that in 2025 annual sales are still expected to be 20.46 million units per year (for household cylinder and upright), the potential volumes of material are significant.[10]

Mandatory marking of plastic components

Similarly to the provision in the recently revised Ecodesign Regulation for electronic displays, we call for the mandatory marking of plastics and additives according to the relevant ISO standards, particularly content which includes flame retardants, in order to further facilitate repair and recycling. Specifically, we recommend the following options:

- Providing detailed markings, such as specifications of the polymer used and/or polymer blend for ease of identification and potential reuse,
- Including a requirement that all plastic parts >50g can be disassembled without permanent damage to the product and with the use of commonly available tools,
- Including a requirement that all plastic parts are made of single polymers or directly recyclable polymer blends (to limit the variety of materials used), as specified in the Voluntary Agreement for Imaging Equipment.

Target disassembly beyond 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. It shall be possible to disassemble devices, easily access and exchange components to enable repair.

More precise requirements on battery lifetime

As far as battery-operated vacuum cleaners and robots are concerned, the requirements on battery lifetime could be made more precise. While specifying a number of charge cycles, the current wording specifies the depth of charge/discharge but it does not specify the charge/discharge rate that should be applied for testing the cycle life. However, the rate of charge/discharge also affects the cycle life. Therefore, it should either be specified that the battery should be charged with the supplied charger and discharged by using the vacuum cleaner set at maximum airflow, or (if the battery is tested separately), a charge/discharge rate should be defined for testing. In that case, we would propose a charge current of 1 I_t A and a discharge current of 2 I_t A according to EN61960, §7.

▪ *Recommendation for the Energy Label*

In addition to the general recommendations provided above we outline some additional suggestions specifically for the Energy Label:

[9] https://www.solvay.com/en/chemical-categories/specialty-polymers/consumer/vacuum-cleaner e.g. see Ryton PPS for Dyson

[10] See table 8 and table 29 of the review study

Adjust the Energy Label classes

As explained above, annual energy consumption requirements would need to be tightened by at least 8% in order to account for the proposed change in the formula. In the table below, we provide a suggestion for a new energy label: class A would be adjusted by 10% compared to the old label, then the remaining classes would have an equal width of 4 kWh. Class G would include all products with consumption higher than 29 kWh (upper limit) and lower than 33kWh (the proposed Ecodesign limit).

Energy Efficiency Class	Annual energy consumption (AE) [kWh/yr]
A (most efficient)	AE ≤ 9
B	9 < AE ≤ 13
C	13 < AE ≤ 17
D	17 < AE ≤ 21
E	21 < AE ≤ 25
F	25 < AE ≤ 29
G (least efficient)	AE > 29

Items to be displayed on the label

- Energy efficiency class (A through G)
- Annual energy consumption (kWh/year)
- Maximum useable volume (MUV) of the receptacle (in litres, as declared by the manufacturer)
- The sound power level (in dB(A)) and the sound power class
- Information that helps consumers buy more durable, reparable products[11], e.g. a reparability score and the free warranty period offered by the manufacturer
- Battery run time for cordless and robots (in minutes)
- If the vacuum cleaner is not suitable for cleaning carpets, an icon to indicate this.

[11] https://ec.europa.eu/info/sites/info/files/ec_circular_economy_final_report_0.pdf DG Justice's behavioural study on consumers' engagement in the Circular Economy describes how effective this could be in shifting purchasing decisions towards products with greater durability and reparability.

Step 2: Consider all other changes to the vacuum cleaners standard in the next revision of the regulations.

In the next revision of the regulations, the European Commission should consider any eventual new test methods included in the revised standard on performance of vacuum cleaners. These could include, for example, using three double strokes instead of five; or the inclusion of debris and fiber pick-up tests.

END

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