Ecodesign & Energy Labelling Regulations for Smartphones expected in 2023

The Energy Label and Ecodesign regulation for smartphones and tablets is work-in-progress and is likely to come into force in 2023 (European Commission, 2021).

The intention of these regulations is to ensure smartphones and tablets are designed to be resource efficient, to avoid unnecessary waste and early obsolescence. Products need to be energy efficient and durable. They must be designed so that they can be repaired and upgraded throughout their lifetime and afterwards be reused or recycled.
Lifecycle assessments have shown that production of mobile phones and tablets is resource intensive and the highest impact comes from the extraction of materials and the manufacturing processes. A robust design, longer battery times, better repairability and upgradability are important factors in the development of a market for second-hand and refurbished devices.

The impact of the legislation is not limited to the European Union. Its impact can be global. The second-hand market for smartphones could be cross-continental as products are small and easily shipped. Where manufacturers would traditionally serve different markets with a multi-tier strategy, refurbished or second-hand devices can fill that gap. In some countries it can become the norm to buy used or refurbished smartphones from higher-tier markets, as these would correspond to the new, but lower-tier models that manufacturers would market there.

Key policy recommendations

1. Functional and security updates for minimum 5 years

The draft Ecodesign regulation proposes 3 years of functionality updates. This is not enough considering the average lifetime of a smartphone today is 2½ - 3½ years and this is what the regulation is trying to lengthen. The minimum period of OS support should be 5 years. This will ensure longer compatibility with third party apps without which the consumer experience is heavily limited, hence a need to purchase a new phone arises.

2. Repair score presented on the Energy Label

The current draft version of the EL regulation does not provide information on how easy it is to repair a device. This crucial information should be assessed and displayed on the Energy Label. A repair score should indicate how easy it is to repair a phone including a number of parameters, such as ease of dismantling the phone, and availability and cost of spare parts and tools. While the JRC study team is setting up a repairability scoring methodology, the EC could start by using the French method (*Indice de Réparabilité*).

3. Repairs must be open to independent repairers

To lower the barrier for consumers to repair rather than replace their smartphone, the repair process must be fast, transparent, and affordable. This can only be achieved if independent repair shops have the possibility to handle device repairs. Manufacturers oppose this stand and claim only authorized repair shops can deliver a safe and quality repair. As a consequence, they restrict distribution of parts, diagnostics, and repair tools.

The EU regulation should therefore (i) ensure that independent repairers can carry out repairs and (ii) clearly list what professional repairers need and need not to provide in order to be granted access to repair information through the manufacturers.

4. Display resistance against water in consumer-friendly way

The scale to assess the resistance to water and dust is based on an existing scale that is unknown and difficult to understand to the average consumer. A scale from A (best) through D (minimum Ecodesign requirement) appears more suitable.

According to the draft EL regulation, the protection against dust and water is displayed on the label using a code based on IEC 60529. The IP code ("ingress protection") is composed of two digits, for example IP67.

Consumers should be able to decide based on the Energy Label alone and should not have to be aware of an existing scale that is not mainstream to interpret the pictogram.

5. Reasonable pricing of spare parts

The draft Ecodesign regulation requires the publication of spare part prices as such. These prices must not increase during the defined time period in which the spare parts must be made available. The draft regulation, however, does not set any price limits, e.g., the maximum cost of a spare part in relation to the cost of the smartphone as a whole.

The regulation should at least add that prices for spare part should be "reasonable" or "proportionate".

6. Empty Class A when regulation enters into force

The energy efficiency classes should be defined in a way that the best class is empty when the regulation enters into force. According to the framework for energy labelling "a newly rescaled label should leave the top class empty to encourage technological progress".

In Annex V, the draft Ecodesign regulation mentions smartphones already in class A. This is not allowed and the regulation contradicts the above principle.

Therefore, the EEI limits should be re-adjusted with the goal of an empty class A in 2023.

7. Clarifications for test conditions determining the EEI

The battery endurance per cycle is calculated using the maximum duration that certain activities can be carried out on the smartphone before the battery runs empty. How long can you watch a video or make a phone call until the phone shuts off?

Suggestion 1: None of the four activity tests should be interrupted by a possible pop-up message (or other) that can appear when a device reaches a certain low battery threshold.

Suggestion 2: There should be a standard webpage used for the web browsing test with a representative amount of pictures/size that is close to real-life conditions.

Both suggestions aim to standardize the test conditions, make tests more comparable independent from the configuration and behaviour of the smartphone model, avoid loopholes, and make testing conditions closer to real-life scenarios.

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Policy recommendations in detail

1. Functional and security updates for minimum 5 years

The draft regulation proposes 3 years of functionality updates after the last device has been placed on the market. This is not enough considering the average lifetime of a smartphone is 2½ - 3½ years today and the whole purpose of the regulation is to increase it. The minimum period of OS support should be 5 years. This would ensure compatibility with third party apps without which the consumer experience is heavily limited, hence a need for a new phone emerges.

Today there are large differences in the market regarding the length of OS support provided to the user, which ranges from under 1 year to above 5 years. For a while now, Apple provides its models with updates for a period of 5 years. This has driven other players to slowly increase their length of OS support as well. Samsung and Google, for example, have followed and extended their OS support. Samsung now offers 4 years of security updates for end consumers (GSMArena, 2021); Google is expected to guarantee 5 years of software support for its latest soon to be released model Pixel 6 (Rahman, 2021). Combined, Samsung and Apple, have a market share of 60% in Europe (Statista, 2021).

With such prominent players offering software and security updates for a period of 5 years, there is no reason why the EU ecodesign regulation should be satisfied with any less than what already exists.

2. Repair score presented on the Energy Label

The current draft version of the EL regulation does not provide information on how easy it is to repair a device. This crucial information should be assessed and displayed on the Energy label. A repair score should indicate how easy it is to repair a phone including a number of parameters, such as ease of dismantling the phone, and availability and cost of spare parts, tools, and repair information. While the JRC study team is setting up a repairability scoring methodology to be used EU-wide, the European Commission could start by using the French method (BAM, 2021). The French Repair Index (*indice de réparabilité*) is mandatory for smartphones and other electrical devices marketed in France since January 2021 (Ministère de l'Ecologie, 2021).

With such an index, repairability will be a more relevant factor in the smartphone purchase decision. There are several reasons consumers increasingly watch out for repairability:

- increased environmental awareness among consumers
- significant bump in prices for new flagship models over the last decade, with flagship models having surpassed the 1'000 EUR threshold
- less frequent break-through technology requiring an immediate phone upgrade
- an increasing number of (government/state/local) programs subsidizing repairs for electronic household devices.

3. Repairs must be open to independent repairers

To lower the barrier for consumers to repair rather than replace their smartphone, the repair process must be fast, transparent, and affordable. This can only be achieved if independent repair shops have the possibility to handle device repairs. Manufacturers oppose this stand and claim only authorized repair shops can deliver a safe and quality repair. As a consequence, they restrict distribution of parts, diagnostics, and repair tools.

The draft ecodesign regulation requires producers to make spare parts and repair information available to professional repairers only. The explicit distinction between professional and non-professional repairers may restrict consumers, volunteer repairers and organisations, such as repair cafés, to obtain access to information and spare parts required. As such, it does not help the objective to make repairs more attractive than replacing phones. In fact, when asked why they did not repair their faulty phone, 80% of consumers stated that repairs are too expensive and 54% stated the repair (process) is too complicated (Paulsen, 2021).

Furthermore, to be granted access to repair and maintenance information professional repairers must register with the producer. The decision whether to accept the registration lies with the manufacturers. To make the authorisation process transparent, the regulation should specify the criteria for approving the request for access.

As matters stand, the draft regulation lists two criteria (demonstration of technical competence and coverage by insurance). It does not specify whether this is an exhaustive list of criteria or these are the minimum requirements while the producer may put forward further demands.

4. Display resistance against water in consumer-friendly way

The scale to assess the resistance to water and dust is based on an existing scale that is unknown to the average consumer. The pictogram representing dust/water protection in the Energy Label draft regulation is too difficult to understand for the consumer.

Consumers should be able to decide based on the Energy Label alone and should not be aware of an existing scale that is not mainstream to interpret the pictogram. A scale from A (best) through D (minimum Ecodesign requirement) appears suitable.

According to the draft EL regulation, the protection against dust and water is displayed on the label using a code based on the norm IEC 60529 (IEC, 2021). The IP code (“ingress protection”) is composed of two digits. The first digit refers to the protection against solid objects (“dust”); the second digit to the protection against liquids. Solids are measured on a scale from 0 to 6. Water is measured on a scale from 0 to 9. The higher the number the better the protection. A rating of IP65 means it's a 6 against dust, and a 5 against water (see Figure 1). A complete table of the different levels of the metrics can be found in Annex I.

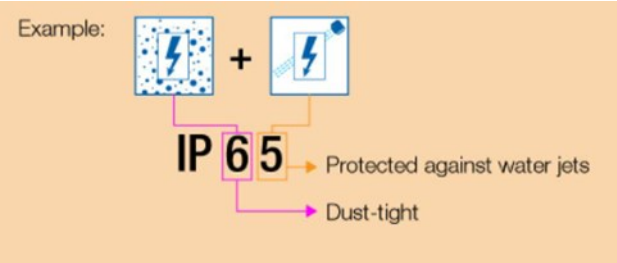

Figure 1: Example from the International Electrotechnical Commission (https://www.iec.ch/ip-ratings)

As the IP scale is not intuitive for the average consumer, the scale should be in line with the other pictogram shown on the Energy Label like the pictogram for drop test reliability (see Figure 2).

Figure 2: Currently planned pictogram for dust / water protection (left) and pictogram for free fall reliability (right)

With the introduction of the new Energy Label for household refrigerators and freezers, washing machines and dishwashers in March 2021, noise emission classes from A to D were added to the label. Before, it included only the noise level expressed in decibel dB(A) (see Figure 3). The change was made because the consumer could not judge how quiet/loud the appliance was based on the decibel alone.

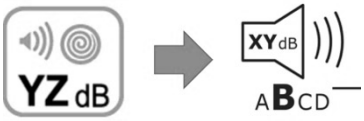

Figure 3: Old (EU reg. 1060/2010) and new pictogram (EU reg. 2019/2016) for noise as of March 2021 adding scale from A to D

Similar to the precedents mentioned here, we believe another pictogram and/or scale is needed for water and dust protection to help the consumer in its purchase decision for smartphones.

5. Reasonable pricing of spare parts

The draft ecodesign regulation requires the publication of spare part prices as such. These prices must not increase during the defined time period in which the spare parts must be made available. The draft regulation, however, does not set any price limits, for instance the maximum cost of a spare part in relation to the cost of the smartphone as a whole.

The regulation should at least add that prices for spare part should be “reasonable” or “proportionate”.

In its resolution of 31 May 2018 on the implementation of the Ecodesign Directive, the Parliament stressed the “need for reparability to be facilitated by the availability of spare parts throughout the lifecycle of a product **at a reasonable price in relation to the total cost of the product**.” (European Commission, 2018).

The ecodesign regulation for a specific product category is the right place to translate the Parliament’s commitment into concrete action. It should therefore address the pricing of spare parts – which can be a dealbreaker in the decision whether to repair or replace a smartphone:

Whether to repair or replace a broken smartphone is mostly an economic decision. A 2018 European Commission behavioural study on consumer engagement in the circular economy has shown that price (especially the ratio between the cost of repair and the price of replacement) was the most important driver for consumers' decisions on repair (European Commission, 2018). Lower prices for spare parts would favour the decision towards fixing the device.

For repair information (not spare parts), the Ecodesign regulation already provides a definition of “reasonable”:

“Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.”

6. Empty A-Class when regulation enters into force

The energy efficiency classes should be defined in a way that the best class is empty when the regulation enters into force. The best classes should be harder to achieve as an incentive for manufacturers to improve their devices even further.

According to the framework for energy labelling "*a newly rescaled label should leave the top class empty to encourage technological progress* […]" (European Comission, 2017).

In ANNEX V ("Benchmarks"), the draft Ecodesign regulation from June 2021 mentions best available technology (BAT) with an EEI of 0,045 h/mAh. This corresponds to class A. If class A is already filled with BAT in 2021, it is likely that in 2023 (when regulations is expected to enter into force) the class is already filled with a high percentage of sold devices on the market. This is not allowed.

Therefore, the EEI limits should be re-adjusted with the goal of an empty class A in 2023.

Washing machines are a good example, what happens if the EEI limits for the top class(es) are set too low. Despite the introduction of a new Energy Label for Household Washing Machines in March 2021 (EU reg. 2019/2023), by the end of the year 2021 an estimated 15% of products are already in class A. Another 33% in class B, and another 33% in class C.

7. Clarifications for test conditions determining the EEI

The battery endurance per cycle is calculated using the maximum duration that a number of activities can be carried out on the smartphone before the battery is empty. How long can you watch a video or make a phone call until the phone shuts off?

Comment 1: None of the four tests should not be interrupted by a possible pop-up message that can appear when a device reaches a certain low battery threshold. This could be seen as circumvention.

This comment relates to all four test settings (phone call, browsing the web, playing a video, standby).

For example, the video playback should not be paused when the "Battery low" message pops up at a remaining battery charge of 20%. Each smartphone model and software may react differently to low-battery messages: some may stop the current activity until the notification is actively confirmed or closed, others may continue their current activity unaffectedly. The different phone behaviour obviously impacts the energy consumption. For this reason, the low-battery warning should either be deactivated or immediately closed in order for the test to continue unimpededly.

Comment 2: There should be a standard webpage used for the web browsing test with a representative amount of pictures/size that is close to real-life conditions.

This comment relates to Annex III Point 5(2) in the draft EC regulation which describes the test conditions for browsing the web until the phone shuts off.

A webpage with more illustrations (pictures and text) will consume more energy than a simple html page that in reality does not exist for the common user. In practice, most energy is likely consumed by loading and displaying advertising. A standard webpage would ensure all smartphones independent from their manufacturer, brand, etc. are tested the same way and thus, the test more comparable.

Both suggestions also aim to avoid loopholes and make test conditions closer to real life conditions.

Further information for improving the test environments are provided by ECOS which has published a detailed paper commenting on the proposed Energy Efficiency Index (ECOS, 2021).

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ANNEX I

Making electrotechnology work for you.

Ingress protection (IP) ratings guide

IP ratings are represented by combining the first and second digits of the below columns

1st numeral - solid foreign objects		2nd numeral - water		
0	No protection	0	No protection	-
1	Protected against solid foreign objects of 50 mm Ø and greater	1	Protected against vertically falling water drops	Vertically falling drops shall have no harmful effects
2	Protected against solid foreign objects of 12,5 mm Ø and greater	2	Protected against vertically falling water drops when enclosure tilted up to 15°	Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to15° on either side of the vertical
3	Protected against solid foreign objects of 2,5 mm Ø and greater	3	Protected against spraying water	Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects
4	Protected against solid foreign objects of 1,0 mm Ø and greater	4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects
5	Dust-protected	5	Protected against water jets	Water projected in jets against the enclosure from any directions shall have no harmful effects
6	Dust-tight	6	Protected against powerful water jets	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects
		7	Protected against the effects of temporary immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time
		8	Protected against the effects of continuous immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7
		9	Protected against high pressure and temperature water jets	Water projected at high pressure and high temperature against the enclosure from any direction shall not have harmful effects

Example: IP 6 5 → Protected against water jets; → Dust-tight

Source: https://www.iec.ch/ip-ratings