The French repairability index

A first assessment – one year after its implementation

www.halteobsolescence.org

Executive summary

Global consumption of electrical and electronic equipment (EEE), but also in France, has reached new record highs each year. They are omnipresent and facilitate our daily activities. Yet, under the current economic system they raise serious environmental concerns. Their production puts considerable pressure on (often scarce) natural resources and causes significant pollution and greenhouse gas emissions. Unsustainable consumption patterns further accelerate product discharge and increase the amount of e-waste (i.e., discarded electronic devices that are no longer wanted, not functional, or obsolete).

As a key part of France's national strategy to extend products' lifespan, a repairability index came into force in January 2021. It has been co-constructed by multiple stakeholders and currently concerns five product categories on the market (TVs, smartphones, washing machines, lawn mowers, and laptops). In the form of a score from 1 to 10, it informs consumers about the repairability of these products and has raised high hopes for more sustainable consumption and better eco-design practices.

This reparability index is a self-declared score calculated by the manufacturers themselves. We believe it is important to independently monitor these scores and the reliability of the information given to consumers to avoid unfair competition and deception of consumers, but also to achieve the environmental objectives expected from this policy device. Indeed, control by the market and by official authorities is crucial. Yet, so far, no official controls and sanctions have been carried out. Therefore, HOP decided to conduct an independent review of the index one year after its implementation, in a critical and constructive way in order to contribute to its evolution.

We interviewed repair actors to gather their observations and reflections, and conducted a survey with a large consumer panel to examine the index's effect. HOP also decided to inspect specific repair scores by recalculating them. The objective was to examine the clarity of the calculation grid, its ambition and the relevance of the index criteria to ensure a uniform interpretation by all actors and the effectiveness of the repairability index itself. The aim was also to ascertain the reliability of the scores given by manufacturers on the products under review. Moreover, we analysed a database containing about 2000 repairability scores to examine the index's current deployment.

Results showed that differences of the ease to repair between different product groups are made visible by the index. Indeed, the complexity of lawn mowers and washing machines is not the same as it is for smartphones or laptops, which is rightfully perceptible in the average scores of these product categories.

It is clear that some manufacturers and distributors have mobilized important resources to enable the creation and display of the repairability index. We have also observed evolving practices of some producers, for instance, by making more repair documents available, or by offering the possibility to easily order spare parts on a dedicated website.

We found that the majority of people (55%) are already familiar with the index. In the light of its rather recent enactment, their understanding of the repairability index and its criteria is notable and customer service agents with whom we interacted seemed well-aware of the new repair scores.

According to our survey, three-quarters of consumers in contact with the index during their purchase of a new device found it to be helpful for making their purchase decision, suggesting the repairability index has already had an effect on consumer behaviour. These decisions are likely to become more sustainable, as products with a better repairability score are more likely to be purchased.

Nevertheless, we believe that the index is far from reaching its full potential, and some improvements are needed to avoid certain loopholes.

The current deployment of the index is characterized by large differences between the five product categories. Whereas we have found (by far) the largest number of indices for smartphones, consumers of laptops will often be left disappointed when searching for a repairability index. It seems a stricter application of the repairability index display is necessary to enable more consumers to identify the most repairable products.

This is additionnally being hampered due to a lack of discrimination between the scores. Across all product categories, products with a low (between 2 and 3,9) and a very low (<=1,9) repairability index remain marginal. This means that either most products are rather or even very repairable, or the current grid does not allow sufficient discrimination between products and is not strict enough with badly repairable products.

The ambition of the repairability index also varies from one product category to another. Most of the lawn mowers and washing machines already have excellent scores. Indeed, we believe that this might discourage manufacturers from putting additional efforts into eco-design, as further improvements would not lead to better repairability scores.

For us, it seems that prior studies have overestimated how familiar people are with the index. Likewise, there are large differences between producers with regards to their knowledge of the repairability index. While larger brands who participated in the development of the repairability index are savvy stakeholders, smaller actors are less aware of the index and present significant knowledge gaps. More sensitization and education of consumers and marketers is still necessary to ensure a rapid deployment and larger impact of the index.

HOP and several stakeholders have concerns about the index's transparency. To address these, we suggest creating a public website to collect and display the repairability index scores; including the completed and detailed calculation grid as well as the commitments on which producers base their calculation of the repair score (in particular the periods of availability of their spare parts and their modalities of access). HOP requests that manufacturers be obliged to make available the completed index calculation grid for their products, and not just a summary grid with scores for the main criteria as is the case today. This will facilitate the "control by the market" which is wanted by the French government, but in reality barely feasible. It will also help to improve consumers' comprehensibility of the index, which is currently limited as it lacks a meaningful unit of measurement. In addition, these measures would enable consumers to access the index of a product that is no longer sold at the time of failure and to hold producers accountable for their declared commitments; and even assist the government by informing about the index's evolution and score distribution for future adjustments, such as scoring thresholds.

HOP carried out a counter-assessment of the repairability indices displayed on 6 products (3 smartphones, 2 laptops and 1 TV) of different brands. Except for one product, we systematically found lower scores. The differences we obtained amount to 1.3 to 1.5 points out of 10 for three of the six products examined - a score up to 15% lower than what the manufacturer claims. For several assessed products, both the availability documentation and of spare parts seem to be overrated by producers compared to the possibilities found by HOP to access them. The latter is for us the most critical point, as it is relatively easy to demonstrate, and one of the most important obstacles to repair. This leads HOP to report several findings to the DGCCRF for in-depth analysis and potential sanctions.

This exercise also revealed the need for more clarification of certain points in the calculation grid and might explain, at least partially, some of the score differences. Such ambiguous points have been identified across all criteria. We urge the Ministry of Ecological Transition to clarify the points highlighted in this report to ensure a uniform interpretation by all actors and guarantee a fair competition.

Overall, scores seem to be generous. In order to better reflect the effective repairability of the products, there is a need to review the scoring system of the index, questioning the equal weight of each criteria. Although in reality very poor scores in one criterion such as disassembly, spare parts availability, or price would make repair impractical, such a product can currently still reach a good overall score. This is possible because poor scores in one criterion are compensated by other criteria. For example, for both Apple devices and the Samsung smartphone we observed good (above 6/10) and even very good (8/10) overall scores. However, the disassembly of all three devices was seriously hindered by welded or glued spare parts, making some failures non-repairable. Likewise, we consider Vivo Y21s` overall good score of 7/10 controversial, as Vivo does not commercialize any spare parts, and thereby blocks the repair of independent professional repairers and consumers themselves. Similar concerns can be raised for the Philips TV scoring an overall good score of 7 out of 10. Although we could not verify the prices for each spare part, Philips low score of 7/20 in criterion 4 (spare part price) seems to suggest that the price could impede the repair of certain spare parts in reality for consumers. We present four alternative scoring systems and highlight their advantages.

Beside, we identified large differences in the degree of ambition across the five criteria. HOP calls into question the relevance of specific sub-criteria and proposes more ambitious ones. These are based on additional obstacles or available facilitators of repair that are not yet accounted for in the index, such as the ease of access documents, the usage of tutorial videos (facilitator), or the neglect of the serialization and pairing of spare parts (obstacle).

In terms of overall research approach, it is important to mention that we focused the majority of our attention on improvement points of the repairability index. Therefore, we acknowledge that more positive aspects of the index might come too short in this report. Therefore, HOP wants to emphasize that we are convinced that the reparability index is an important and valuable instrument in the fight against the throw away consumption culture. This is underpinned by its positive effect on consumer behaviour and producer practices that have been highlighted in this report.

In sum, this report sets out requests for clarification and recommendations for the French public authorities, and to help the consumer protection authority to target certain parameters in their controls. The aim is to increase transparency around the repairability index to ensure consumer confidence in the instrument. We believe our remarks can also provide insightful inputs for the ongoing reflections on the European repair score and on the future French durability index.

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Acknowledgements

Presentation of HOP and the background to this report

Supported by a community of over 70,000 people, HOP (Stop to Planned Obsolescence) has been campaigning since 2015 for more durable and repairable products through awareness raising, advocacy, and legal actions. In November 2018 it also launched the Club de la Durabilité, a network of companies involved in the transition towards durability of goods and services.

This report was written by two members of the HOP team: Marcus Bergmann, in charge of HOP's coalition of the repairability index and PhD candidate at ESCP Business School, and Ronan Groussier public affairs manager, under the supervision of Laetitia Vasseur, General Delegate and co-founder of HOP. In addition to its own work and analysis, HOP relied on an informal coalition of various actors in the repair sector, whom we warmly thank[1]. These different actors were keen to share their vision and observations on the reparability index, in order to contribute to building a reliable and relevant tool.

Although it concerns a French public policy device, we wrote this report in English because we consider this feedback on the French reparability index to be very valuable for non-French stakeholders. In fact, HOP has been contacted by several organizations from across the globe to discuss the deployment of such a repair score. Furthermore, we believe that our insights can contribute to the discussions on the European repair score project. A summary is also written in French and can be found in the appendix.

1 Cf page 64 to read our full acknowledgements.

Key numbers of the report

Environment

3.5%
The carbon footprint of EEEs is increasing and already accounting for 3.5% of the global emissions, with three quarters of these emissions concentrated in the production phase

53.6 M
In 2019 the global amount of e-waste reached a staggering 53.6 million metric tons - an increase of 58% in less than 10 years, making it the world's fastest growing waste stream

21%
In France the recycling rate was 21% in 2019

30-40%
Only 30% to 40% of EEE failures are repaired in France. Outside the warranty period this number even falls to 10%

60%
French authorities hope that the repairability index will contribute to reaching a repair rate of 60% until 2025

Methodology

27
27 people have been interviewed and shared their thoughts on the repairability index

4
We included insights from the 4 stakeholders groups directly addressed in the repairability index (manufacturers, distributors, repairers, and consumers)

1,206
We collected 1206 respondents in our survey

6
6 devices have been assessed

Study results

76%
76% of those people that in 2021 purchased a new device and indicated to have noticed the index, found the index to be helpful for orienting their final purchase choice

4
For at least 4 out of 5 product groups, the score distribution seems to be skewed towards the highest scores, making low scores very scarce to find

55%
55% of the French population is aware of the index

28%
In 2021, out of 762 people who purchased a device concerned by the index, only 28% saw the repairability index during their purchase

6-8.1
Among the 5 product groups average scores vary from 6.0 (laptops) to 8.1 (lawn mowers)

33%
33% of our respondents still have important knowledge gaps about the repairability index

5
HOP found different scores for 5 devices out of 6

1.5
The biggest score difference observed is 1.5 over a score of 10

“France tackles throwaway culture with the repairability index[2]”

“Why France’s new ‘repairability index’ is a big deal[3]”

Here are some titles of press articles in February 2021.

2 https://earthbound.report/2021/02/24/france-tackles-throwaway-culture-with-the-repairability-index/
3 https://grist.org/climate/why-frances-new-repairability-index-is-a-big-deal/

Introduction. An independent report to contribute to the evolution of the repairability index

One year after its implementation, HOP takes stock of the reparability index.

The reparability index is an innovation that came into force in France in January 2021 for five product categories of electrical and electronic equipment (EEE), following several years of preparation with many stakeholders. Informing consumers about the repairability of these products, it raised high hopes for more sustainable consumption patterns and pushing manufacturers to design more repairable products. As a key part of France's national strategy to extend products' lifespan, this repair index serves to address obstacles to repair, and is in line with other regulatory instruments, such as the repair fund to reduce its cost, or the obligation to make spare parts available.

The reparability index is a self-declared score calculated by the manufacturers themselves, using a standard assessment grid provided by the Ministry of Ecological Transition (MTE). For this reason, we believe it is important to independently monitor these scores and the reliability of the information given to consumers. Indeed, control by the market and by official authorities is crucial to avoid unfair competition and deception of consumers, but also to achieve the environmental benefits associated with repair. Controls and sanctions in case of fraudulent scores (or failure to display the score) are applied from 2022 by the Directorate General for Competition, Consumer Affairs and Fraud Control (DGCCRF).

Involved in the elaboration and implementation of the anti-waste and circular economy law (AGEC) by taking part in numerous working groups to defend consumers and the environment, HOP decided to conduct an independent review of the index one year after its implementation, in a critical and constructive way in order to contribute to its evolution and success.

We interviewed repair actors to gather their observations and reflections, and conducted a survey with a large consumer panel to examine the index's effect. HOP also decided to inspect specific repair scores by recalculating them, in order to test the methodology and to carry out the control by the market wished by the public authorities. The objective was to examine the clarity of the calculation grid, its ambition, and the relevance of the index criteria to ensure a uniform interpretation by all actors and the effectiveness of the repairability index itself. Building on our findings, this report sets out requests for clarification and recommendations for the French public authorities and to help the DGCCRF to target certain parameters in their controls.

We believe our remarks can also contribute to the ongoing reflections on the European repair score and on the future French durability index. Finally, the aim is to increase transparency around the index to ensure consumer confidence in the instrument.

First, we recall how and why the reparability index was set up. Second, we present a global assessment of its deployment and consumers'perception. Third, we describe the method and results obtained for our own calculation of the score of six products which we compared to the ones calculated by producers. Finally, we summarise our recommendations and the points we feel need further clarification from the MTE.

Part 1.
The development of a pioneer repairability index

In this section, we look back at the genesis of the reparability index. Firstly, we briefly summarise the environmental impacts of the overproduction of electrical and electronic equipment (EEE), making it essential to extend their lifespan. Subsequently, we present the benefits of repair and its current barriers. We then show that the reparability index is a solution to overcome them. Lastly, we explain how the index will evolve in France and how it is inspiring other similar international measures.

A. Electrical and electronic equipment, an unsustainable consumption

Global consumption of EEE, and also in France, is reaching new record highs each year[4]. Yet, under the current economic system, their unsustainable production and consumption patterns raise serious environmental concerns. Unsustainable stress exerted on natural resources and greenhouse gases emitted during their production, as well as the increasing amount of e-waste (discarded electronic devices that are no longer wanted, not functional, or obsolete) and other negative externalities on biodiversity and local communities are the consequences.

Their production relies on the extraction of huge quantities of rare metals and other scarce resources, which is often very polluting and energy-intensive. As a result, the carbon footprint of EEEs is increasing and already accounting for 3.5% of global emissions[5], with three quarters of these emissions concentrated in the production phase[6]. Besides, manufacturers are concerned about the availability and supply of those materials for new EEEs in the future.

At the other end of the supply chain, the amount of e-waste is regularly setting new records worldwide. In 2019 the global amount reached a staggering 53.6 million metric tons - an increase of 58% in less than 10 years, making it the world's fastest growing waste stream[7][8]. The United Nations (UN) is speaking of a "tsunami of e-waste"[9]. Experts concluded that this is the equivalent in weight of more than 4,500 Eiffel Towers. Transferring these numbers to the global population would assign 7.3 kilograms to each individual. Yet, in France it reaches 21 kg per capita, indicating that more developed countries are responsible for the lion share of the total amount. This problem is further exacerbated by the very low collection and recycling rate. In France the recycling rate was 21% in 2019[10]. As already highlighted by a study published in 2019[11], **extending the lifespan of EEEs is an absolute necessity to compensate for their externalities**.

4 Ademe, 2021 - Preparatory study for the introduction of a durability index
5 Belkhir and Elmeligi, 2018. Assessing ICT global emissions footprint: Trends to 2040 & recommendations
6 Ademe,2019. « Modélisation et évaluation du poids carbone de produits de consommation et biens d'équipement »
7 Statista, 2022 - Electronic waste generated worldwide from 2010 to 2019 (in million metric tons)*
8 Statista, 2022 - Projected electronic waste generation worldwide from 2019 to 2030 (in million metric tons)*
9 https://www.un.org/sustainabledevelopment/blog/2015/05/un-environment-chief-warns-of-tsunami-of-e-waste-at-conference-on-chemical-treaties/
10 Forti V., Baldé C.P., Kuehr R., Bel G. The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential.
11 European Environmental Bureau & ECOS, 2019. Coolproducts don't cost the earth.

B. Repair allows the extension of lifespan but remains marginal

One of the main levers to extend the life of EEE is repair. The French Agency for Ecological Transition (ADEME)[12] finds that extending the lifespan by the means of repairs can significantly reduce the environmental burden of EEEs. For example, the CO2 emissions that could be avoided range from the equivalent of 13 kg CO2 emissions for a smartphone to 124 kg kg CO2 emissions for a TV. Overall, ADEME estimates that France could avoid up to 2,218 tonnes of CO2 emissions per year related to the repair of smartphones and up to 5,704 tonnes of CO2 emissions per year for TVs[13]. In times of national CO2 budgeting, a more systematic use of repair could make a significant contribution to France's efforts of limiting climate change. In addition to these environmental benefits, French households could save between 12.8 and 32.2 million euros per year, if the repair of 5 common EEEs increased by only 2% to 5%.

However today, **only 30% to 40% of EEE failures are repaired in France[14]**. **Outside the warranty period this number even falls to 10%[15]**. The majority of people tend to replace their product with a new one. Five main barriers can explain this weak performance[16]:

- the cost of repair compared to the low price of new appliances: people do not repair an equipment if the cost of the repair exceeds 30% of the price of the device;
- the consumer's perception of products as being poorly repairable;
- the lack of pertinent information from manufacturers or sellers: over 50% of the French lament a lack of transparency about the availability of spare parts, the expected product lifespan, or missing documentation such as a disassembly map[17];
- the lack of spare parts;
- consumer´s fears or caveats about the repair itself: for example about the repair time, a feeling of complexity, or even the fear of repair failure.

These habits and fears are reinforced by the fact that people constantly receive stimuli to renew their products, notably via advertising and marketing. Also, many devices are becoming more fragile, due to an increasing inherent complexity, additional features, constant connectivity, and ever smaller components. These trends engender new technical breakdowns and reinforce consumer´s caveats about repair.

C. A new consumer information tool to foster repair

In the pursuit of more sustainable consumption patterns, France is advocating a circular economy and boosting repair. One key measure of these efforts is the **mandatory display of a repairability index for EEE.**

Anchored in article 16 of law of 10 February 2020 against waste and for the circular economy (AGEC), this index aims at informing consumers about the repairability of the products they buy. As of January 2021, producers, importers or distributors need to communicate free of charge to sellers the score of the repairability index and its sub-criteria. The sellers, in turn, must inform the consumers free of charge at the time of purchase about the index, and also provide the sub-criteria upon request.

12 The Ademe is a public agency under the joint authority of the Ministry for an Ecological Transition and the Ministry for Higher Education, Research and Innovation

13 ADEME, 2020. Fiche d'impact générale sur l'indice de réparabilité

14 ADEME, 2020. Les Français et la réparation.

15 ADEME, 2021. Fonds réparation de la filière équipements électriques et électroniques

16 ADEME, 2020. Les Français et la réparation.

17 ADEME, 2020. Fiche d'impact générale sur l'indice de réparabilité

The repairability index pursues a double objective:

- to push consumers towards more repairable products, by addressing the asymmetric information between producers and consumers about product features;
- to encourage producers to put eco-design at the core of their products by facilitating the repairability of their products. Such a mechanism has been observed for the European Energy label, as manufacturers driven by market competition are striving towards having the best performing product on the market[18].

In the end, **French authorities hope that the repairability index will contribute to reaching a repair rate of 60% within five years.**

As of January 1, 2021, the index covers 5 pilot product categories:

Front-loading washing machines | Smartphones | Laptops | TV monitors | Electric lawn mowers (with electric cable, with a battery, and robots)

These product categories have been selected because they are wide-spread and represent a significant impact on economic household budgets as well as on the environment; but also because there were enough voluntary stakeholders (including manufacturers) willing to participate in the working groups with the Ademe and the Ministry.

Consistent with the the previously identified barriers to repair, the calculation of the repairability index includes the following 5 criteria [19]:

- **Availability of technical documentation:** a score is established in relation to the commitment of the producer to make technical documents available, for free and for a number of years.
- **Ease of disassembly:** a score is established in relation to the number of steps needed to disassemble main parts of the product, the types of tools necessary for it, and the characteristics of fasteners used to attach spare parts.
- **Spare parts availability:** a score is determined in relation to the producer's commitment to make spare parts available over time and their delivery time.
- **Spare parts price:** a score is calculated using the ratio between the price of the spare parts most commonly subject to failure and the price of the product.
- **Product-specific criteria:** a score is established in relation to product-specific sub-criteria, such as accessibility of a usage-counter, free remote assistance, or the possibility to reset softwares.

These criteria have been developed in a co-construction process involving diverse stakeholders, such as industry associations, manufacturers, distributors, repairers, other companies from the repair industry, and NGOs such as HOP (with varying degrees of involvement). The balance of the interest groups present is an important and delicate issue, as the resources (human, financial, or technical) of each actor differ and sanitary measures related to the pandemic hampered access to face-to-face meetings in Paris. Under the supervision of the Ministry for Ecological Transition and the ADEME the details of calculation methodology were discussed and negotiated by these stakeholders from June 2018 to January 2020, before the Ministry started to draft the regulatory texts.

The index is displayed in the form of a score from 1 to 10 in a color-coded label:

Figure 1 - Graphical charter of the repairability index (French Ministry of ecological transition (MTE)

18 ADEME, 2020. Fiche d'impact générale sur l'indice de réparabilité

19 Decree number 2020-1757 of December 29, 2020 relating to the repairability index of electrical and electronic equipment

D. The index's international extension and metamorphosis

In the coming months and years to follow, the repairability index will go through different transformational processes induced by national and international regulation. **By 2024** the law against waste and for the circular economy foresees that **the repairability index will transform into a durability index**, and include additional criteria related to product reliability and upgradeability.

As the first of its kind, **this pioneer repairability index is also extending its relevance beyond the French borders**. HOP has been in direct contact with organizations from Luxembourg, Sweden and even Australia, to discuss the deployment of such an score. Other countries, such as Spain, already publicly announced that they will also implement a repairability score for EEEs soon[20]. Besides, international distributors operating in France are encouraged to leverage the repairability index and apply their know-how in voluntary labels around the globe. More importantly, European institutions are also working on a repairability score. At first, European institutions announced regulatory measures for EEEs including smartphones, tablets and laptops in order to include minimum requirements for their design in terms of energy efficiency, durability, reparability, and recycling. Then, in September 2021 the Joint Research Centre (JRC) of the European Commission presented the first draft of **a new European repair scoring system for smartphones and tablets** which is strongly inspired by the French methodology. It should enter into force in the coming years.

To increase the repairability index's impact, it has been decided to **extend its scope to five new product categories each year**. For 2022, the following product groups were selected:

Top-loading washing machines | Vacuum cleaners | Tablets | Dishwashers | High pressure cleaners

Tablets have been eventually abandoned due to superseding European regulations taking place in parallel.

Just as for the "first generation" of products, a working group was created for each new product category. New formats such as remote conferences facilitated participation for many actors and improved the balance of the interest groups. While the structure of the index based on the original 5 criteria remains the same, the working groups deal with the definition of its exact scope and scoring thresholds. HOP has participated in these working groups to defend consumer rights and the environment by fighting for the most ambitious index possible.

HOP is convinced that the repairability index can contribute to the fight against environmental degradation due to the overconsumption of EEEs. Yet, it is important to recall that this index is a worldwide pioneer. We believe multiple lessons can be learned from the first pilote product groups to further improve its impact and nourish similar international projects. This report aims to point out some first learnings.

20 https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/consumo/Paginas/2021/150321-etiqueta_reparabilidad.aspx

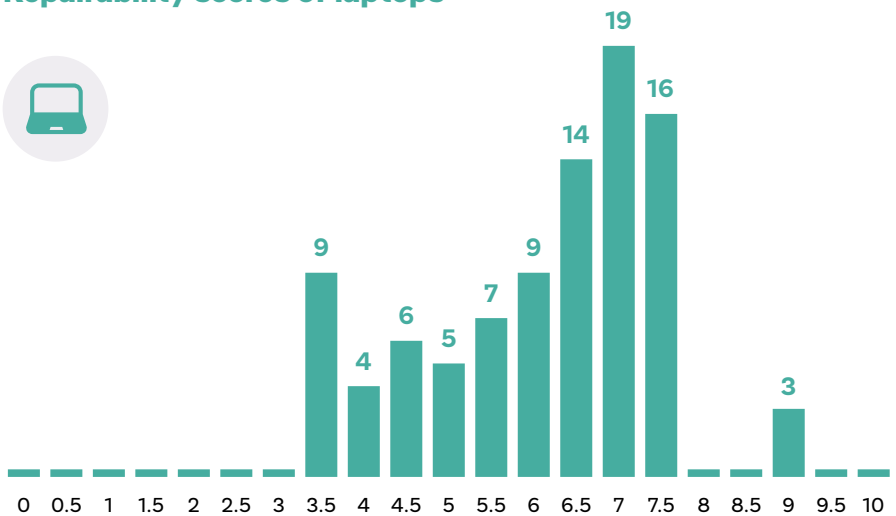
Part 2.
From theory to practice, reviewing the deployment of the index

In this chapter we provide insights about some impacts the repairability index has had so far. Therefore, we will first provide an overview of the repairability scores that have been published by the manufacturers and sellers hitherto. Then, we will turn our attention to the consumers and other stakeholders, revealing their understanding and awareness of the index. Lastly, we show the power of the index to change purchase behaviour among French consumers.

Overview of repairability scores

Thanks to Spareka, a French firm selling spare parts and advocating for more repairables products, which has launched a website gathering index scores[21], we have access to a great database including a total of 1992 published indices from all 5 products concerned. This part shows the descriptive statistics summarizing the key features of each product category. **Note that this database, and so the analysis that follows, is not exhaustive**. Not all brands and models are represented, as Spareka found itself increasingly overwhelmed to keep their database updated due to limited resources.

Repairability scores of laptops



Number of scores in the database: **92**

Issued by **8** producers

Minimum score: **3.5/10** (Microsoft)

Maximum score: **9.0/10** (Lenovo)

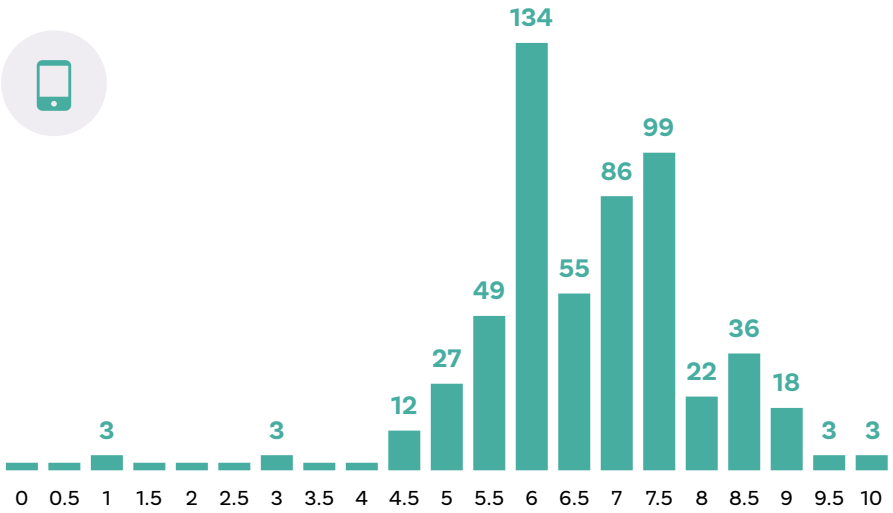
Average score: **6/10**

Comments:

- Lowest average score among the 5 product categories;
- In general, repairers reported a declining ease of repairability of laptops due to constant miniaturisation of devices and components. In addition, although there are differences between manufacturers, components are increasingly welded or glued. This seems to validate the lowest average score of laptops among the five product categories.
- The greatest spread (meaning the scores are more stretched out along the scoring scale) among the 5 product categories.
- The smallest number of scores among the 5 product groups, which is coherent with other studies indicating that laptops have the lowest product coverage rate

21 indicereparabilite.fr

Repairability scores of smartphones



Number of scores in the database: **550**

Issued by **28** producers

Minimum score: **1/10** (KXD)

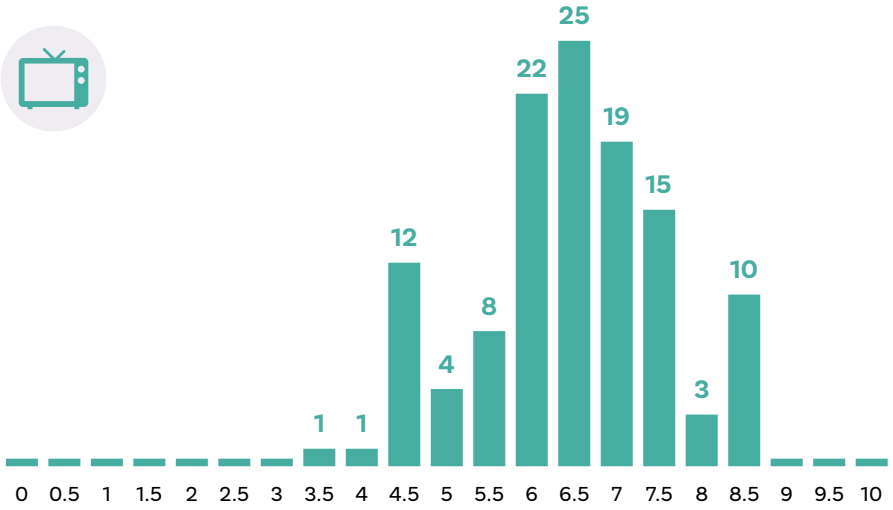
Maximum score: **9.6/10** (Athesi)

Average score: **6.5/10**

Comments:

- Largest number of scores among 5 product categories;
- Larger range of scores compared to laptops, starting at a score of 1 and going up until 9.6;
- Yet, overall scores seem skewed towards the right, indicating that smartphones are, in general, more reparable than laptops;
- Best scores have been published by the French company Athesis with a whooping 9.6, which is even higher than the 9.3 from Fairphone and the highest repairability score on the market.
- In terms of general repairability, repairers reported new emerging obstacles of repair, such as the serialization and pairing of spare parts, which makes more and more spare parts non-replaceable. This trend is not accounted for in the repairability index yet.

Repairability scores of TVs



Number of scores in the database: **120**

Issued by **12** producers

Minimum score: **3.2/10** (Continental Edison)

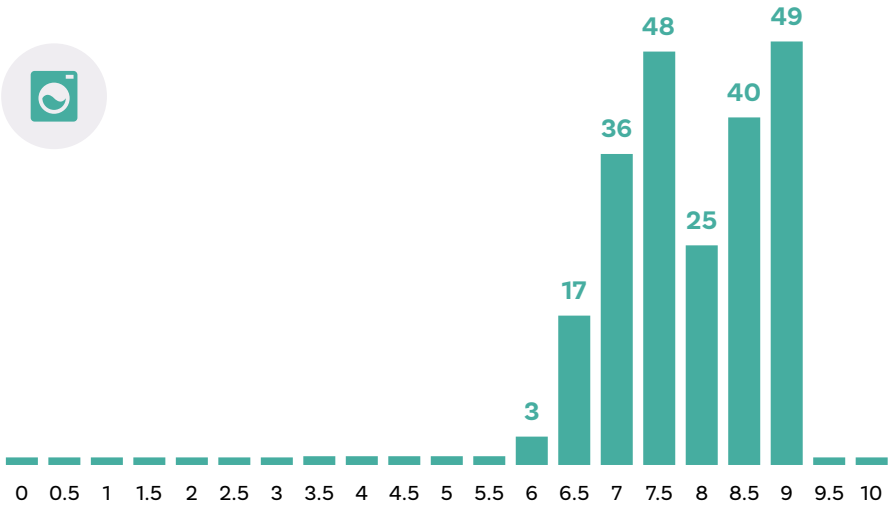
Maximum score: **8.5/10** (Samsung)

Average score: **7.3/10**

Comments:

- According to a specialist in TV repair, those scores seem rather generous. For example, in practice all smaller TVs such as with 32-inch displays that cost around 250-300 Euros are not repaired due to economic considerations. Nevertheless, multiple above average scores have been observed. Currently, it seems possible for some brands which are not well known for their repairability to obtain (very) good scores;
- Samsung is the manufacturer with the best overall score (8.5), the best average score (7.3) and the most repairability indices published (28 TVs).

Repairability scores of washing machines



Number of scores in the database: **218**

Issued by **18** producers

Minimum score: **5.6/10** (Electrolux)

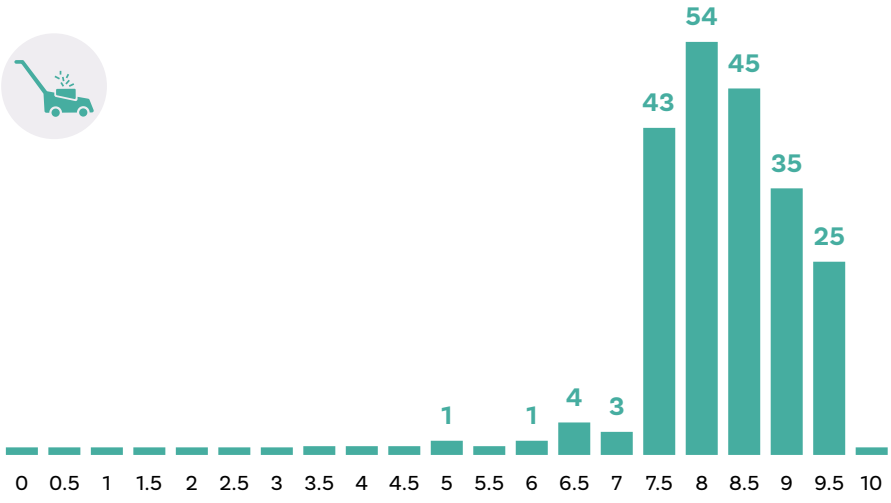
Maximum score: **8.7/10** (Samsung)

Average score: **7.7/10**

Comments:

- The score range has overall shrunken, meaning that washing machines have a rather homogeneous repairability index;
- The scores are strongly skewed to the right. In general, consumers will find that washing machines have a higher repairability index than smartphones, TVs, or laptops;
- We noticed much more homogenous scores for products from the same brand. Compared to other product categories, such as TVs, smartphones, and laptops, all brands evaluated their washing machine sortiment very similarly. For example, whereas Samsung declared repairability scores for its smartphones ranging from 5.6 to 8.6, their complete washing machines sortiment differs no more than 0.6. This observation could be confirmed for all brands in the database;
- Yet, Samsung clearly stands out: most scores published (76), their lowest score is 8.1, whereas most of its products score an impressive 8.7, which is also the maximum score in the database.

Repairability scores of lawn mowers



Number of scores in the database: **212**

Issued by **26** producers

Minimum score: **4.9/10** (Black & Decker)

Maximum score: **9.5/10** (Elem Garden Technic)

Average score: **8.1/10**

Comments:

- Highest average score among the 5 product categories;
- Most data points close to the maximum score (lowest spread and strong skew to the right);
- Very few badly evaluated devices;
- With some exceptions, consumers will only find lawn mowers with green repairability indices.

In sum, for the 5 product categories we have drawn the following main conclusions:

- We observed that across all product categories, products with a low (between 2 and 3,9) and a very low (<=1,9) repairability index remain marginal. It means either most products are rather or even very repairable, or the current grid does not allow sufficient discrimination between products and is not strict enough with badly repairable products. This finding mirrors the results of other studies[22] and confirms possible shortcomings of the index. Contrary to other press communications[23], it calls into question whether the repairability index effectively allows consumers to easily identify which products are more repairable than others. We believe that the full potential of the repairability index can only be achieved if the entire scale of the index is being used.
- In line with point 1, **the ambition of the repairability index varies strongly from one product category to another.** Most of the lawn mowers and washing machines already have excellent scores. Indeed, we believe that this might discourage manufacturers from putting additional efforts into eco-design, as further improvements would not lead to better repairability scores. Thus, this lack of ambition is conflicting with the fundamental objective of repairability index to push manufactures towards better eco-design practices.
- Building on point 2, we acknowledge that the differences in the distribution of scores between product categories can also rightfully reflect differences of their repairability. Indeed, the complexity of lawn mowers and washing machines is not the same as it is for smartphones or laptops. This could then explain, at least partly, these distribution differences, meaning some product categories are overall easier repariable than others.

People's understanding of the repairability index

Having a repairability index that is easily appropriated by consumers and other stakeholders is of crucial importance to achieve its objectives. To examine people's understanding and awareness of the index, we created an online survey in collaboration with the Collaboration Centre on Sustainable Consumption and Production (CSCP)*. In addition, we conducted interviews with repairers, distributors, and industry member representatives. The following section summaries our findings.

* Online survey carried out from 02.12.2021 to 07.12.2021 by the agency Cint with a sample of 1206 respondents, drawn up according to the quota method and representative of the French population (mainland) aged 18 and older.
In the semi-structured interviews with 27 stakeholders we focused on the interviewee's overall impression of the repairability index (for example the relevance of the grid, the criteria selected, etc.); improvement points (e.g. ambivalent criteria, lack of sub-criteria, lack of ambition, etc.); other specific points, such as suspicious scores of certain models, common obstacles for repair, etc.

Are you aware of the national repairability index?

In our study we found **55% of the French population is aware of the index** (figure 7). This is an encouraging number, but it is inferior to prior studies[24] [25] which claimed that its notoriety is increasing and that 76% of the French have already heard about it. This is also true for the repair industry itself, as a lot of repairers are still unaware of the index. Although our findings suggest that less people are aware of the repairability index, it is still the majority.

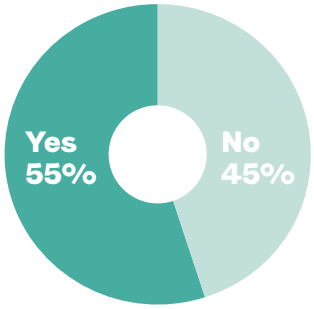


Figure 7

Please indicate your point of view: "I completely understand how the repairability index has been calculated"

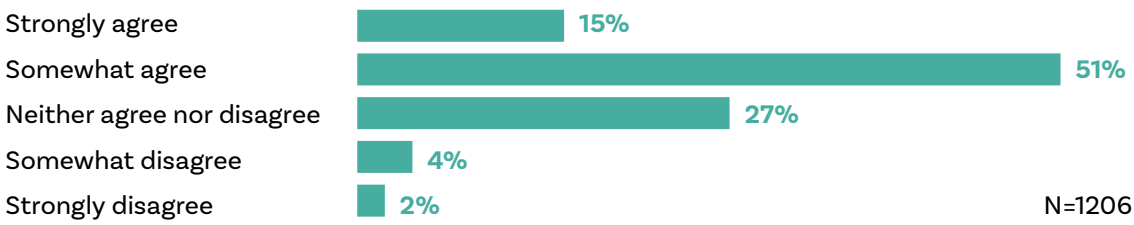


Figure 8

22 UFC Que Choisir - INDICE DE RÉPARABILITÉ Une indispensable réforme pour le crédibiliser
23 https://www.gifam.fr/wp-content/uploads/2022/01/Gifam_CP-Reparabilite_VD.pdf
24 Samsung survey 1 - https://news.samsung.com/fr/sondage-indice-reparabilite
25 Samsung survey 2 - https://www.neomag.fr/article/9600/indice-de-reparabilite-le-second-baromere-samsung-ademe-confirme-linteret-des-francais

Only 15% declare to fully grasp its methodology, while 51% say they rather understand it (figure 8). To dig deeper into consumers´knowledge of the index, we asked respondents who have heard about the index to select its main characteristics (figure 9). HOP added some false characteristics (red dots) to make their responses more reliable. The format of a score out of 10 has been well apprehended, but there is still some confusion about the index specific content. While overall the true characteristics were well identified, some false characteristics still received a significant number of votes. Likewise, there are large differences between brands when it comes to their knowledge of the Repairability Index. Brands such as Samsung, Apple, SEB, Bosch and others who participated in the development of the index are much more advanced than small companies. For the latter, counting the steps to disassemble the product, and some document terminology still pose problems.

Please indicate what you know about the repairability index

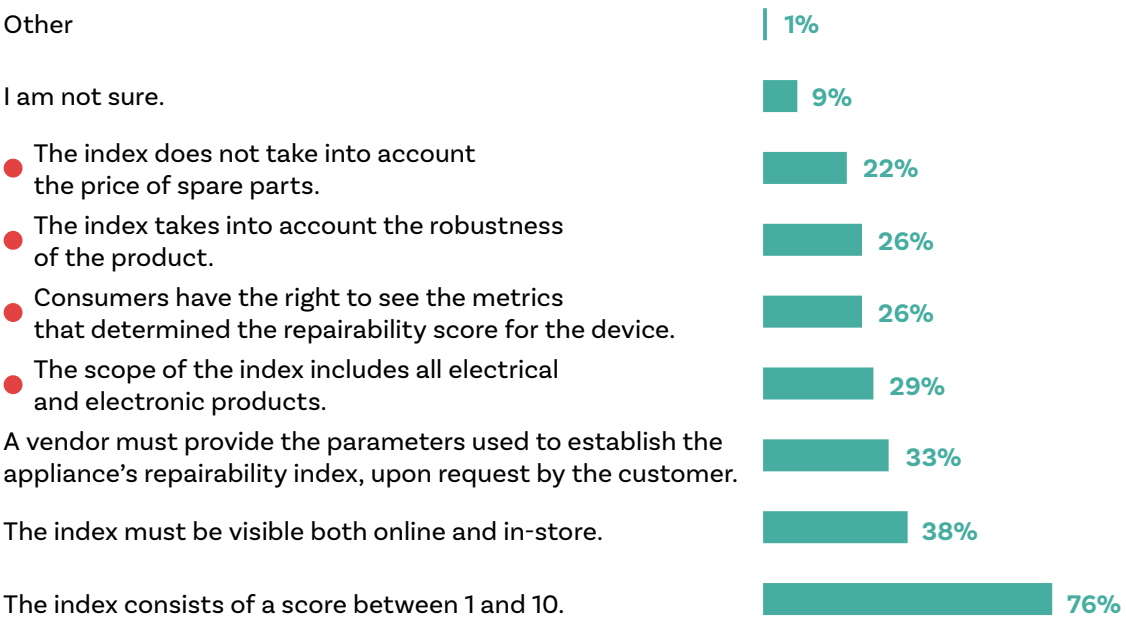


Figure 9. N=658

Did you see the repairability index of the product during the purchase?

Given its rather recent enactment, we consider consumers' understanding of the repairability index overall notable. However, the proportion of people still unaware of it is surprising. This might be partly explained by the fact that **in 2021 the index´ visibility was very low**. Out of 762 people who purchased a device concerned by the index, only 28% saw the repairability index during their purchase (figure 10).

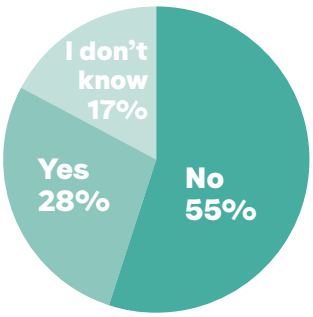


Figure 10. N=762

Where have you heard of the repairability index?

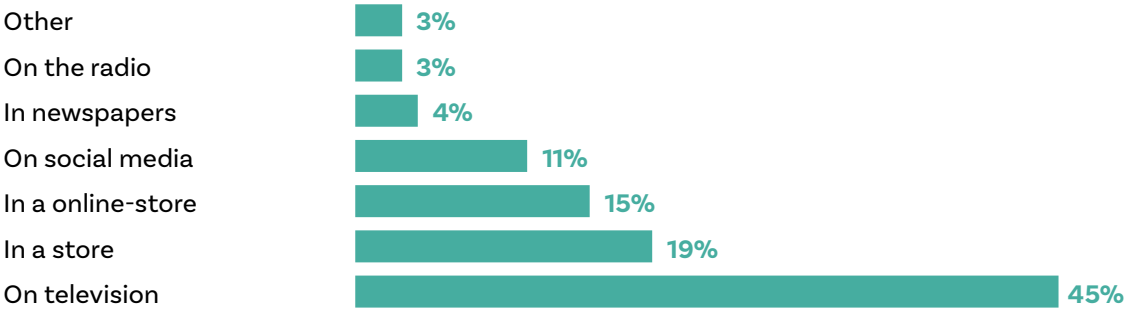


Figure 11. N=658

Overall these findings indicate that communication on the subject has been effective, but **more sensitization and education is still necessary** to foster repair and change consumer behaviour. Figure 11 shows the most successful channels to inform people about the index in 2021. HOP suggests intensifying TV media campaigns with clear consumer messages referring explicitly to the repairability index. Beyond that, it seems that social media channels are not yet exploited enough.

The effect on consumer behaviour

"If the index shall orientate manufacturers towards eco-design, the most effective way would be to demonstrate through a study that it influences consumer behavior"[26]

This is what we are trying to do in this section. Together with the CSCP, we created a questionnaire and experiment to test the impact of the reparability index on consumer behaviour*.

* For more details cf. appendix A

- Due to methodological limitations, we used purchase intention as a proxy
- We focus on one product category: smartphones
- We collected 1206 responses for a survey with an A/B test mechanism
- Different product options were shown and respondents were asked how likely they were to buy them (5-point likert scale)
- Variables:
  - favourite brand vs not favourite brand,
  - repairability index (medium score vs high score),
  - price (medium vs high)

Figure 12. Example of a proposed product choice

Was this repairability index helpful for making your purchase choice?

The results of our study are clear indications of the repairability index' power to affect consumer behaviour. 76% of those people that in 2021 purchased a new device and indicated to have noticed the index, found the index to be helpful for orienting their final choice (figure 13).

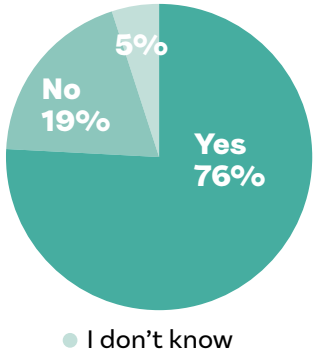


Figure 13. N=211

Overall, the vast majority would recommend their friends to rely on the repairability index to make their product choice, while only 9% wouldn't (figure 14).

26 Translation by HOP of an extract of an interview with the Public Policy Manager, Sustainability at Amazon

In all of the scenarios of our experiment, we found that the degree of product repairability significantly affects the consumer choice. Smartphones with a higher repairability score are more likely to be purchased (cf. appendix B).

How likely are you to recommend a friend to reply upon the repairability index?

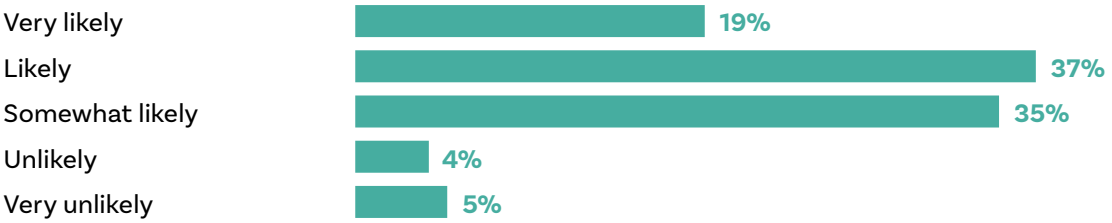


Figure 14. N=658

Conclusion

Most consumers are already familiar with the index. But compared to prior studies, we found a lower proportion of people aware of the index (55%); and identified index characteristics that people are less familiar with. Thereby, we highlight **a need for further sensitization and education** of both consumers and manufacturers to maximize the index´s effect.

This is directly related to the limited visibility of the repairability index in 2021. Zooming in, it seems that **the repairability index´s impact is varying among the product categories**. Although we cannot quantify the total number of models concerned by the index, we have found (by far) the largest number of indices for smartphones, with a wide range of scores. On the other hand, consumers of laptops will be often left disappointed when searching for a repairability index. In this case, **a stricter application of the repairability index is necessary**.

For other product categories, such as washing machines and lawn mowers, we feel that **the index´s impact is being limited due to a lack of discrimination**, showing very similar high scores for the majority of products.

If the index is displayed and discriminating product models, we could confirm its power to change consumer behaviour in favour of more repairable products. The vast majority of consumers having come in contact with the index found it to be helpful and our experiment confirmed that **more repairable products are more likely to be purchased**.

Part 3.
HOP's counter-assessment of six product scores

The notion of an auto-declarative scoring system was decided during the elaboration of the index. This system is based on the principle of transparency, subject to the vigilance of market stakeholders and civil society, as well as to controls and sanctions from public authority. Besides, even though the repairability index came into effect on January 1, 2021 demanding its mandatory display for five electric and electronic products, 2021 was declared free of official controls, in order to give time to market stakeholders to implement the measure.

In line with this logic, HOP decided to launch a first series of score checkings. To ensure that the new repairability index is a success, we are convinced that it is necessary to put in place independent counter-assessments of the repairability score. We believe that this will both increase consumer confidence in the index and nourish the implementation of the first official controls, carried out by the General Directorate for Competition Policy, Consumer Affairs and Fraud Control (DGCCRF[27]), in 2022.

This chapter describes our counter-assessment of six products. First, we reiterate the methodology of the repairability index which we will apply for our calculations. We will, zoom in on the 5 criteria and stress particularities of certain sub-criteria and the official instructions manual. Subsequently, we describe our sampling and data collection. Lastly, we compare the manufacturers' scores with our own calculations.

27 Within the Ministry for the Economy, the DGCCRF ensures the proper functioning of the markets, for the benefit of consumers and businesses.

A. The methodology of the repairability index

The repairability index is displayed as a score between 0 and 10.

This score is the sum of 5 equally weighted criteria (each earning a maximum of 2 points out of 10): Access to (1) documentation and (3) spare parts; (2) the ease of disassembly; (4) the price for spare parts; and (5) product-specific criteria.

Each criterium is further divided into sub-criteria, which are weighted discriminatorily.

Criteria	Sub-criteria	Score of subcriterion /10	Weighting factor of subcriterion	Score of criterion /20	Total criteria scores /100
Criterion 1 : documentation	1.1 Availability of the technical documentation and other documentation related to user and maintenance instructions	0	2	0	
Criterion 2 : Disassembly, accessibility, tools, fasteners	2.1 Ease of disassembly parts from List 2*	0	1	0	
	2.2 Necessary tools (List 2)	0	0.5		
	2.3 Fasteners characteristics parts from List 1** and List 2	0	0.5		
Criterion 3 : Availability of spare parts	3.1 Availability over time parts from List 2	0	1	0	0
	3.2 Availability over time parts from List 1	0	0.5		
	3.3 Delivery time parts from List 2	0	0.3		
	3.4 Delivery time parts from List 1		0.2		
Criterion 4 : Price of spare parts	4. Ratio between price of parts from list 2 to the price of the product		2	0	
Criterion 5 : Specific criterion	5.1 Accessibility of usage-counter to consumers		1	0	
	5.2 Free remote assistance		0.5		
	5.3 Possibility to reset softwares		0.5		
Reparability index on 10:					**0**

Figure 15 - Repairability index calculation and its parameters (example for washing machine)

Criterium 1 concerns the access to **documentation** which facilitates repairs. It includes the following 15 documents, which can be provided in various physical or digital formats:

- 1.1.A - the unequivocal identification of the product
- 1.1.B - A disassembly map or exploded view
- 1.1.C - Wiring and connection diagrams
- 1.1.D - Electronic boards diagrams
- 1.1.E - List of necessary repair and test equipment
- 1.1.F - Technical manual of instructions for repair
- 1.1. G - Diagnostic fault and error codes
- 1.1.H - Component and diagnosis information
- 1.1I - Instructions for software and firmware
- 1.1. J - Information on how to access data records of reported failure incidents stored on the product
- 1.1.K - Technical bulletin
- 1.1. L - Guidance for self-repair
- 1.1. M - How to get access to professional repairers
- 1.1. N - Failures detection and required action
- 1.1.O - User and maintenance instructions

Manufacturers must fill out two columns, one with relation to repairers and another to consumers, selecting their commitment on their availability over time of each document.

Criterion 2 describes the **ease of disassembly**, including three sub-criteria: (2.1) the number of steps required to disassemble the spare parts; (2.2) the type of tools necessary for disassembly; and (2.3) the type of fasteners used to fix each spare part.

For each product category two lists of spare parts have been established. "List 2" includes the 3 to 5 spare parts which account for most of the breakdowns. "List 1" comprises up to 10 other functional spare parts that are necessary for the operation of the device. The sub-criteria (2.1) "the number of steps required to disassemble the spare parts"; and (2.2) "the type of tools necessary for disassembly" refer only to list 2, whereas the type of fasteners used to fix each spare part (2.3.) has to be declared for all spare parts of list 1 and 2.

Criterion 3 informs about the manufacturer's commitment on the **availability over time of spare parts**, including those of list 1 and 2; as well as the manufacturer's commitment on the delivery time of these spare parts. For each spare part the manufacturer has to complete 4 columns corresponding to (1) the manufacturer's repair centre; (2) spare part retailers; (3) repairers; and (4) consumers.

Each column has the same weight. Yet, the availability of spare parts from list 2 are given the greatest importance, accounting for 50% of all the points of criterion 3 compared to 25% for those of list 1. The delivery time for parts from list 2 make up 15%, leaving 10% to the delivery time for parts from list 1.

Criterion 4 concerns the **price of main spare parts**, established by calculating the ratio between: (a) the pre-tax price of the most expensive part in list 2 + (average of the pre-tax prices of the other parts in list 2) divided by 2 and (b) the price of the entire device concerned, excluding taxes.

Delivery costs are deducted from the calculation. In case that, at the time the index is calculated, a part from list 2 is not available, the number of points awarded this criterion is 0.

Criterion 5 is **specific to the product category** concerned.

Figure 3 summarizes criterion 5 for the different product categories :

Criterion	Sub-criteria	Weighting factor	Stakeholders concerned
Criterion 5 : product-specifc criteria		**2 (in total)**	
Washing machines	«5.1. - Accessibility of usage-counter 5.2. - Free remote assistance 5.3.A - Possibility to reset the electronic card 5.3.B - Possibility to reset firmwares»	1 0.5 0.25 0.25	Consumers Repairers and consumers Manufacturers, repairers, consumers Manufacturers, repairers, consumers
TVs	5.1. - Accessibility of usage-counter 5.2. - Free remote assistance 5.3.A - Possibility to reset the electronic card 5.3.B - Possibility to reset firmwares	1 0.5 0.25 0.25	Consumers Repairers and consumers Manufacturers, repairers, consumers Manufacturers, repairers, consumers
Laptops	5.1. - Information about types of updates 5.2 - Free remote assistance 5.3.A - Possibility to reset softwares 5.3.B - Possibility to reset firmwares	1 0.5 0.25 0.25	Consumers Repairers and consumers Consumers Consumers
Smartphones	5.1. - Information about types of updates 5.2 - Free remote assistance 5.3.A - Possibility to reset softwares 5.3.B - Possibility to reset firmwares	1 0.5 0.25 0.25	Consumers Repairers and consumers Manufacturers, repairers, consumers Manufacturers, repairers, consumers
Corded lawn mowers	5.1. - Free remote assistance 5.2. - Possibility to use multi-product batteries 5.3.A - Possibility to reset the motherboard 5.3.B - Possibility to reset firmwares	0.6 0.6 0.4 0.4	Repairers and consumers Consumers Manufacturers, repairers, consumers Manufacturers, repairers, consumers
Cordless lawn mowers	5.1. - Free remote assistance	2	Repairers and consumers
Robotic lawn mowers	5.1. - Free remote assistance 5.2. - Possibility to use multi-product batteries	1 1	Repairers and consumers Consumers

Figure 16. Summary of criterion 5 (inspired by UFC Que Choisir - Table 1 Annex)

Some methodological elements used by HOP to conduct its own calculations

Sampling

To select the products for our counter-assessment, we used multiple criteria:

- First, the product must have an index which is already publicly accessible. Some eligible products still did not have a repairability index or the summary of the sub-criteria, and were consequently excluded.
- Second, to increase the relevance and representability of our counter-assessments, we used several sources[28] to identify products with a high market share based on their sales volume.
- Third, we wanted to include a multitude of different brands in our report.
- Fourth, we chose products with rather good scores, to understand if it was reliable information for consumers who would naturally turn to the best rated products.
- Fifth, in order to keep the environmental impact of the report to a minimum, we made the choice not to purchase new products. Instead, we relied on the product's availability among our coalition partners, which additionally restricted our choices.

As a result, we have selected the following six products from three product categories :

Laptop	Acer A317	599.99 Euro[29]	8,2 /10
	Apple MacBook A2141	2,749.00 Euro[30]	6,2 /10
TV	PHILIPS 50PUS8546	899.99 Euro[31]	7 /10
Smartphone	Apple Iphone 7+	233 Euro[32]	6,4 /10
	Samsung Galaxy A41	299 Euro[33]	8 /10
	Vivo Y21S	199 Euro[34]	7,6 /10

At this stage and given HOP's limited resources, we did not add more product models and excluded lawn mowers and washing machines for this first counter-assessment, but we would like to include them in the future.

28 These publicly available online sources include Amazon's best sellers; FnacDarty's best sales, c-discount's best sales, Omdia's top 10 most shipped smartphones in 2020 (https://www.frandroid.com/produits-android/smartphone/848799_les-smartphones-les-plus-vendus-en-2020-sont-toujours-des-iphone), the best selling smartphone models in Q1 2021 by Counterpoint (https://www.counterpointresearch.com/best-selling-models-q1-2021/), as well as the most popular smartphones in September 2021 based on data from SFR (CNETFRANCE).

29 Price as indicated on Fnac.com in December 2021

30 Price as indicated on Apple.com in December 2021

31 Price as indicated on Darty.com in December 2021

32 Price as indicated on Backmarket.fr in December 2021

33 Price as indicated by Fnac.com in December 2021

34 Price as indicated on Darty.com in December 2021

Data collection and analysis

For each of those products we retrieved the overall repairability score and the summary grid revealing the scores for each sub-criteria.

To counter-assess criterion 1 (availability of documentation), we went to the producers website to retrieve all types of documentation required by the repairability index. When necessary, we additionally contacted the customer service via chat, email or telephone.

For our methodology it was important to distinguish between independent repairers and authorized repairers. We did not find any explicit instructions as to how to define column B - repairers. However, there are some specifications for a similar situation for criterion 3 (availability of spare parts): *"In the event that the producer or importer does not make spare parts directly available to independent repairers, then points are not awarded in column C for criteria 3.1, 3.2, 3.3, 3.4."* (Instructions manual)[35]. To be coherent, we decided to apply the same rule for criterion 1 (documentation). That means, we did not award any points to column B if we did not find a required document, although some authorized repairers might have access to it. We believe that this is in line with the objectives of the repairability index, which is to facilitate repairs for a diverse range of stakeholders, including independent repairers and consumers. On the other hand, if we found a required document, then we awarded full points for both colonnes (B - repairers and C - consumers), given the impossibility for us to check the availability for the years to come. Hence, we presumed that manufacturers will keep documents on their websites in the future.

1.1.H - Component and diagnosis information

We believe that this sub-criterion lacks precision. For our purposes, we considered that manufacturers should provide information about the technical specifications of components. For example, information regarding a display should contain the display brand, diagonal, pixels per inch, brightness and contrast ratio, as well as unique component reference number. This would enable the consumer to identify an equivalent spare part.

1.1.K - Technical bulletin (categorically earning full points)

Points are awarded if the edition of a technical bulletin is planned on an ongoing basis (when necessary) (instructions manual). We acknowledge that sub-criterion is very difficult to verify, even for an official authority such as the DGCCRF, for it contains a futuristic wording. Therefore, we have always awarded full points as it is not verifiable from our side.

For criterion 2, we reached out to the members of our coalition and agreed to disassemble each product at our partner's workshop. To ensure the authenticity of our way of working, disassembly operations were performed by a professional repairer, along with a member of HOP in charge of the calculation method of the index.

To check criterion 3, the availability of spare parts, we first searched on the manufacturer's website for the possibility to order spare parts. When we did not find such a possibility on the website, we contacted the manufacturer´s customer service to inquire about all the possibilities of purchasing spare parts. In addition, we contacted official repair centres and inquired about their spare part stock.

35 https://www.ecologie.gouv.fr/sites/default/files/210107%20-%20notice%20-%20indice%20de%20r%C3%A9parabilit%C3%A9.pdf

Just like for criterion 1, **it is impossible for us to check the availability of parts over time, so we checked if parts were available or not, and granted maximum points if available. This method can lead to an overestimation of the score.**

We acknowledge that the estimated delivery time is only an approximation of the real delivery time. Nevertheless, due to budgetary constraints and environmental concerns we decided to accept this methodological limitation and by default take the manufacturers' information as given. We made one exception to this rule: we decided to order a new SAMSUNG charger for our office, which allowed us to verify the exact delivery time of this spare part.

Criteria 4 (price)

If manufacturers provided the possibility to purchase spare parts, we used the current prices for the calculation of criterion 4. We acknowledge that this is a deviation from the official calculation method, in which the prices to be used are those which represented the highest share of the turnover of the manufacturer or the importer for the type of parts or the type of equipment concerned, as during the last closed financial year (in cases of manufacturers having several tariff scales according to the different categories of distributor or seller customers). This information is, however, highly sensitive and confidential. Nevertheless, we wanted to have an estimation of criterion 4. Besides, this method enables us to represent the situation of consumers and independent repairers who would like to buy a part.

The product-specific criteria (criterion 5)

Criterion 5.1.A (Information about the different existing updates)

- We ask volunteers in possession of the device in question to report whether during their latest update (of the operating system, firmware or drivers) information about the nature of the update was provided or not. In addition, we also searched on the manufacturers website if such details were available for the updates provided, or contacted the customer service.

Criterion 5.2.A (the type of remote assistance)

- We searched for information to identify causes of failures, or how to repair on the manufacturer's website. In addition, we contacted technical service via phone or chat and asked for remote assistance.

The other criteria (5.1.A accessibility of usage-counter; 5.3.A Electronic card/Operating system reset; and 5.3.B Firmware reset) were examined together with a professional repairer or technical service of the manufacturer via remote assistance.

Results

The results of our couter-assessment are to be interpreted with caution. We were not always able to access all the necessary information and had to make assumptions. We do not pretend our own calculated scores to be «the true score» for each product. Mainly, we wanted to make sophisticated approximations which can be compared with manufacturer scores. In addition, this exercise allowed us to identify fuzzy points of the grid or instructions manual.

Acer A317

Laptop. Assessment summary

The Acer A317 received 8.3 from HOP, which is comparable with Acer's score of 8.2.

In general, we obtained similar results for each sub-criterion. No major anomalies were found which should reassure consumers. Rather we found better scores than ACER for remote assistance and possibility to reset softwares. We believe that this is due to certain methodological choices in the allocation of points that we have made, and that it highlights the need for clarification on these two points.

Total score Acer A317	8,2 /10	8,3 /10	
Criterion	**Score Acer**	**Score HOP**	**Comments**
1. Documentation	**16.9**	**16.9**	Unavailable documents: • 1.1.D - Electronic boards diagrams • 1.1. J - Information on how to access data records of reported failure incidents stored on the product 1.1.H - Component and diagnosis information *(HOP had doubts about the terminology)* 1.1.K - Technical bulletin *(Categorically earning full points)*
2. Disassembly	**19,5**	**18,1**	
2.1. Spare parts from list 2	10	9,3	Battery - 4 steps (full 3 points) Mass memory - 4 steps (full 3 points) Power connector - 4 steps (full 3 points) Charger - 0 steps (full 3 points) Display - 8 steps (2 points) -> Acer must have calculated less than 7 steps
2.2. Necessary tools to remove spare parts from list 2	10	10	All parts could be removed with common tools (lever, cross-headed screwdriver).
2.3. Characteristics of fasteners for the assembly of spare parts from list 1 and list 2.	9	7,5	We identified three types of fasteners in the Acer: (1) neither removable nor reusable fasteners (0 points), used for the keyboard and a HDMI and three USB ports (a reusable fastener was used for a fourth USB port) ; (2) removable and not reusable fastener (1 point) for the motherboard (screws but also thermal paste were used) (3) removable and reusable fasteners (2 points), used for the RAM memory, the fan, the mass memory, the display channel, the battery and the power connector. On this sub criterion Acer calculated a score of 9, so there is a small gap.

Total score Acer A317	8,2 /10	8,3 /10	
Criterion	**Score Acer**	**Score HOP**	**Comments**
3. Availability of spare parts	**12,2**	**14,4**	The list of available parts was not directly accessible on ACER website. We used the client chatbox service, using the reference number of the product, to get information about parts, their price and how to order them. Some differences in this criterion may be due to HOP's impossibility to access some data and the resulting methodological choices. We find better scores for the availability of parts as we attribute maximum points if parts are available at the moment of our inquiry, but lower scores on delivery times as we used an estimation.
3.1 Commitment on the availability over time of spare parts from list 2	7,4	10	All spare parts from list 2 were available.
3.2. Commitment on the availability over time of spare parts from list 1	2	6	Acer confirmed the availability of the following parts from list 1, earning full points: motherboard, Ram memory, keyboard. The fan and the USB port were not available at the moment of inquiry (0 points).
3.3. Commitment on the delivery time of spare parts from list 2	7,5	3,3	The service agent with whom we have communicated via chat did have no information about the delivery time of each spare part. In general, the delivery time is 1 week. We used this information for all spare parts as an estimate for our calculation.
3.4. Commitment on the delivery time of spare parts from list 1	7,5	2	We used the same estimate of 1 week for the motherboard, ram memory, and keyboard. 0 points were given to the fan and the connectors.
4. Price of spare parts from list 2	**18**	**15**	Prices used for this part were collected via the chatbox of Acer customer service, and correspond to the spare parts' prices in December 2021 (prices can evolve). Mass memory: 127.78 Euro / Display: 135.4 Euro / Battery: 62.86 Euro / Power connector: 21.22 Euro /Charger: 38.94 Euro / Price for the Acer 317: 599.99 Euro We get a 3 point lower score here, but it may be explained by the fact that we used consumer prices, which according to the official method are not necessarily the prices taken into account (see previous section).
5. Product-specific	**15,5**	**18,8**	
5.1.A Information about the different existing updates	10	10	Users are proposed to skip an update and to access detailed information about the nature of the update (full points).
5.2. Free remote assistance	6	10	Full points were awarded for both column B (repaires) and column C (consumers). Acer provides different types of remote services to facilitate repair, including information on its support website, chat service, or via telephone, or an interactive forum. We granted the maximum points in column C, meaning the manufacturer offers a "Remote support for repair (hotline, visio, remote control, etc.)". In this case, this is true concerning software support, but not for assistance on a hardware repair. We decided to tick the box, but are not 100% sure this is the correct interpretation of the official method.
5.3. Possibility to reset softwares	5	7,5	The operating system can be reset with an USB stick or with an integrated module (half of the points). Firmwares listed in the repairability index, such as drivers for external devices such as printers can be updated via a remote server (full points).

Scores in bold (for an entire criterion) are out of 20; scores for sub-criterion are out of 10

Apple MacBook Pro A2141

Laptop. Assessment summary

Our counter-assessment of the MacBook Pro A2141 resulted in an overall score of 5.8 compared to 6.2 declared by Apple. The difference is slight but allows Apple to display a green index for its product which would be yellow with our score, and masks a significant divergence of interpretation on criterion 3.

Note: Due to a lack of information, two important assumptions were made:

- Concerning column A in criterion 3 (spare parts availability), we awarded full points in our calculations;
- As for criterion 4 (price), we calculated with the values used by Apple.

These assumptions can lead to an overestimation of the score.

Total score Apple Macbook Pro A2141 6,2 /10 5,8 /10

Criterion	Score Apple	Score HOP	Comments
1. Documentation	**12.3**	**10**	Unavailable documents (cf. appendix C.1): • 1.1.B - A disassembly map or exploded view • 1.1.C - Wiring and connection diagrams • 1.1.D - Electronic boards diagrams • 1.1.E - List of necessary repair and test equipment • 1.1.F - Technical manual of instructions for repair • 1.1.H - Component and diagnosis information • 1.1. L - Guidance for self-repair 1.1.H - Component and diagnosis information *(HOP had doubts about the terminology)* 1.1.K - Technical bulletin *(Categorically earning full points)*
2. Disassembly	**5,3**	**6**	For types of tools we found the same score as Apple, however we found a slightly lower score on the number of disassembly steps and a higher score on the types of fasteners.
2.1. Spare parts from list 2	2	2	Many parts from list 2 are welded, including the mass memory, the display panel, and the battery (0 points). We considered welded parts as not removable. According to the professional repairers we worked with, although it might in theory be possible to unweld a part in some cases, in practice and in our case this would most likely lead to engendering serious damage to the device. None of the professional repairers we inquired about this issue would seriously consider this intervention. However, this is not clearly stated in the official instructions manual. Although the power connector is removable, the disassembly is rather onerous. We counted 11 steps to access this part (0 points). The charger is, as expected, disassembled in 3 steps (full 3 points).
2.2. Necessary tools to remove spare parts from list 2	3	3	The mass memory, the display panel, and the battery are welded, i.e. non-removable (0 points). The power connector is removable but only with specific tools (2 points). For example, to open the laptop, the repairer needed to use a suction cup and specific screwdrivers (for pentalob screws). The charger was removable without any tools (full 4 points). Due to the use of multiple types of screws, the disassembly proved to be laborious. 3 different types of screwdrivers were necessary. Compared to the Acer, this is a clear limitation for repair.
2.3. Characteristics of fasteners for the assembly of spare parts from list 1 and list 2.	3,5	5	We identified two types of fasteners in the Apple Macbook: (1) neither removable nor reusable fasteners (0 points), used for the RAM memory, the keyboard, the mass memory, the display panel, and the battery; (2) removable and reusable fasteners (2 points), which fastened the motherboard, the fan, the ports and connectors to connect external equipment, the power connector and the charger.

Total score Apple Macbook Pro A2141	**6,2** /10	**5,8** /10	
Criterion	**Score Apple**	**Score HOP**	**Comments**
3. Availability of spare parts	9,7	6,7	*We found systematically lower scores than Apple for these sub-criteria. To our knowledge, Apple does not make parts available outside of its authorised repair channels and its own service department (except its charger). For this reason we consider columns B, C and D for the 4 sub-criteria to be 0 points for all other spare parts. The discrepancy observed raises questions for us, and seems to demonstrate a strong divergence of interpretation on this criterion.*
3.1 Commitment on the availability over time of spare parts from list 2	5	4	With the exception of the charger, Apple does not propose the possibility to purchase any spare parts on its website. Via chat, the Apple agent confirmed that if the device requires hardware repair, only an Apple Store or Apple Authorised Service Centre advisor will be able to repair the device. On the contrary, the purchase of spare parts is also not possible. For the charger we awarded full points in all columns. All other spare parts from list 1 and 2 earned 0 points in columns D (consumer) and C (repairer) and B (distributor). Although Apple Service did not reveal any information about the availability of their spare parts, full points were awarded in column A for all spare parts and all sub-crteria of criterion 3. *This assumption could lead to an overestimation of our score.*
3.2. Commitment on the availability over time of spare parts from list 1	4,5	2,5	Cf. sub-criterion 3.1
3.3. Commitment on the delivery time of spare parts from list 2	5	3	Cf. sub-criterion 3.1 The charger is deliverd within 3-7 days (1 point in columns B, C and D)
3.4. Commitment on the delivery time of spare parts from list 1	4,5	2,5	Cf. sub-criterion 3.1
4 - Price of spare parts from list 2	**15**	**Not checked**	We contacted multiple repairers authorized by Apple to inquire about the repair costs of specific spare parts. All repairers refused to give us a cost estimate due to confidentiality agreements with Apple. Prices will only be revealed once the device has been examined by a technicien of an official Apple Service provider. Hence, we were not able to retrieve the necessary information to perform an estimation of criterion 4. To compute a final score, we used the same score as Apple for criterion 4.
5. Product-specific	**20**	**20**	
5.1.A Information about the different existing updates	10	10	Users can skip an update and access detailed information about the nature of the update.
5.2. Free remote assistance	10	10	Full points were awarded for both column B (repaires) and column C (consumers). Apple provides different types of remote services to facilitate repair for its MacBook, including information on its support website, chat service, or via telephone.
5.3. Possibility to reset softwares	10	10	It is possible to download and install older versions of macOS on the MacBook. On the Apple support website consumers can check the compatibility of a specific macOS version with the Mac at hand and also then download the version of their preference. Firmwares listed in the repairability index, for example drivers for external devices such as printers can be updated by the consumer. According to the technical support of Apple, if older versions are available from the device manufacturer they can be installed on the MacBook. Likewise, it is possible to restore the system to factory settings.

Scores in bold (for an entire criterion) are out of 20; scores for sub-criterion are out of 10

Philips 50PUS8546

TV. Assessment summary

Its official repairability score is 7. In our counter-assessment the PHILIPS TV 50PUS8546 scores 5.5. While we have found only slightly lower scores for the ease of disassembly (criterion 2) and the product-specific criteria (criterion 5), our results differ significantly in criterion 1 (documentation) and 3 (availability of parts). The difference allows Philips to display a green index instead of a yellow one.

Note: Due to a lack of information, two important assumptions were made:
- Concerning column A in criterion 3, we awarded full points in our calculations;
- As for criterion 4, we calculated with the values used by Philips.

These assumptions can lead to an overestimation of the score.

Total score Philips 50PUS8546	7 /10	5,5 /10	
Criterion	**Score Philips**	**Score HOP**	**Comments**
1. Documentation	16.4	8.5	Unavailable documents: • 1.1.B - A disassembly map or exploded view • 1.1.C - Wiring and connection diagrams • 1.1.D - Electronic boards diagrams • 1.1.E - List of necessary repair and test equipment • 1.1.F - Technical manual of instructions for repair • 1.1.G - Diagnostic fault and error codes • 1.1.H - Component and diagnosis information (HOP had doubts the about terminology) • 1.1. L - Guidance for self-repair 1.1.K - Technical bulletin *(Categorically earning full points)*
2. Disassembly	**16.4**	**15**	*During this assessment, one limitation of the counting methodology has become apparent. As stated in the instructions manual, only the removal of a part or the change of a tool are counted. On the contrary, removing fasteners is not accounted for. The problem is that the amount of fasteners can vary significantly. In our example, this variation ranged from two screws for the removal of the TVs foot, to 13 screws fixing the metal bar at the bottom of the screen. In other words, the effort to remove one part can change notably from one spare part to another, even in the same device. This is not accounted for in the repairability index.*
2.1. Spare parts from list 2	10	6.7	The results for the 4 spare parts of this list are: • the remote control - 1 step (3 points), • the internal power supply - 7 steps (3 points), • the main board - 8 steps (2 points) • and the display panel - 25 steps (0 points) (considering 14 steps alone for the removal of 14 clip bases holding the frame on the display panel).
2.2. Necessary tools to remove spare parts from list 2	6.3	8.8	For the disassembly of most parts only two common screwdrivers and a lever were necessary. *Yet, to remove the display panel, a hair dryer was needed to heat the adhesive between the display panel and its support. Again, this example shows that the index does not account for all the effort necessary to remove spare parts. After removing the display panel, adhesive rests remain on the support, which would need to be removed before assembling the new display panel.* Overall, the display panel earned 2 points, while the other three parts earned 4 points each.
2.3. Characteristics of fasteners for the assembly of spare parts from list 1 and list 2.	6.5	8	Two types of fasteners are used in the Phillips TV: (1) neither removable nor reusable fasteners (0 points), used for the display panel, and the battery; and the connectors to connect external equipment; (2) removable and reusable fasteners (2 points), fastening the rear cover, wifi module, Bluetooth module, infrared receiver, loudspeakers, remote control, internal power and the mainboard. We found a lower score for the number of disassembly steps, but higher scores on used tools and fasteners.

Total score Philips 50PUS8546 7 /10 5,5 /10

Criterion	Score Philips	Score HOP	Comments
3. Availability of spare parts	10.2	6.6	*Despite the fact that our choice might lead to an overestimation of the score, we found lower scores than Philips for parts availability. Philips score raises questions for us, as it is inconsistent with the information we were able to gather.*
3.1 Commitment on the availability over time of spare parts from list 2	5.2	4.4	Phillips commercialises accessories parts, including remote controls and power cables via the company TP Vision. No other spare parts are available for purchase, as confirmed by two service agents via chat. That means, only the remote control accumulated some points in our assessment. For the rest of the spare parts, 0 points were awarded in column B (distributor), C (repairers), and D (consumers). We acknowledge that some spare parts may be available for authorized repair centres (acting as after-sales service subcontractor), awarding points in column A. To confirm this, we spoke to one of Phillips official repair centres. However, this information is only shared after an initial inspection of the device. Consequently, HOP could not confirm it. Yet, we chose to award full points in column A. This might lead to an overestimation of the score.
3.2. Commitment on the availability over time of spare parts from list 1	4.8	2.5	Cf. sub-criterion 3.1.
3.3. Commitment on the delivery time of spare parts from list 2	5.4	1.5	On the day of our assessment (11.01.2022) Phillips indicated an estimated delivery time of more than 4 weeks for the remote control, corresponding to 0 points in the repairability index. 0 points were awarded in column B (distributor), C (repairer), and D (consumer), because no other spare parts were available for purchase. Although we could not verify column A, full points were awarded for all spare parts from both list 2 and list 1. This might lead to an overestimation of the score.
3.4. Commitment on the delivery time of spare parts from list 1	5	2.5	Cf. sub-criterion 3.3.
4 - Price of spare parts from list 2	**7**	**Not checked**	*We contacted Philips to inquire about the repair costs of specific spare parts. Yet, prices will only be revealed once the device has been examined by a customer service technicien. Hence, we were not able to retrieve the necessary information to perform an estimation of criterion 4.* *To compute a final score, we used the same score as Philips for criterion 4.*
5. Product-specific	20	17.5	*According to Philips customers' service, reset of the electronic card is not possible and should lead to zero points for this parameter, the sub-criterion 5.3 score should be 5 and not 10 out of 10.*
5.1.A Information about the different existing updates	10	10	By typing 123 654 on the Philips remote control, the counter usage menu can be accessed.
5.2. Free remote assistance	10	10	Full points were awarded for both column B (repairers) and column C (consumers). Phillips provides different types of remote services to facilitate repair, including a forum on its support website, a chat service, or via telephone.
5.3. Possibility to reset softwares	10	5	A reset of the electronic card is not possible. This was confirmed by two agents via Phillip´s chat service (0 points for all columns). It is possible to do a factory reset in the TV menu (full points).

Scores in bold (for an entire criterion) are out of 20; scores for sub-criterion are out of 10

Apple Iphone 7+

Smartphone. Assessment summary

Apple calculated a repairability score of 6.4, whereas our assessment resulted in a score of 5.8. The difference is small but allows Apple to display a green index instead of a yellow one.

Note: Due to a lack of information, two important assumptions were made:
- Concerning column A in criterion 3, we awarded full points in our calculations;
- As for criterion 4, we calculated with the values used by Apple.

These assumptions can lead to an overestimation of the score.

Total score Apple Iphone 7+	**6,4** /10	**5,8** /10	
Criterion	**Score Apple**	**Score HOP**	**Comments**
1. Documentation	12.3	8.5	Unavailable documents: • 1.1.B - A disassembly map or exploded view • 1.1.C - Wiring and connection diagrams • 1.1.D - Electronic boards diagrams • 1.1.E - List of necessary repair and test equipment • 1.1.F - Technical manual of instructions for repair • 1.1.H - Component and diagnosis information (HOP had doubts the about terminology) • 1.1. J - Information on how to access data records of reported failure incidents stored on the product • 1.1. L - Guidance for self-repair 1.1.K - Technical bulletin (Categorically earning full points) During our assessment we noticed this statement in the Apple user guide: *"Repairing: Don't open iPhone and don't attempt to repair iPhone by yourself. Disassembling iPhone may damage it or may cause injury to you. If iPhone is damaged, malfunctions, or comes in contact with liquid, contact Apple or an Apple Authorized Service Provider."* HOP worries that statements such as the latter will strongly discourage consumers from self-repair. Indeed, we believe that such a contraindication is opposed to the objective of the repairability index and should be reflected in the repairability score. Currently, however, the repairability index does take into account contraindications to repair.
2. Disassembly	**4.3**	**6.8**	
2.1. Spare parts from list 2	0.8	1.7	The results for the 4 spare parts of this list which need to be evaluated are: • the battery - 10 steps (1 point), • the display - 19 steps (0 points), • the front camera - not applicable, because non-separable from the microphone, light sensor, proximity sensor (0 points), • the rear camera - 13 steps (1 points) *The removal of the battery is exceptionally challenging. To facilitate its removal, Apple provided pull-taps. By pulling them by hand, the battery will be lifted out. Unfortunately, these pull-taps are very fragile. According to two technicians, only 50% of the time can the battery be removed successfully. They base their observations on a combined experience of working on over 700 iphones. As of today, the repairability index is not able to capture this problem, because this difficulty does not lead to adding steps as defined in the method.* *We were not sure whether we'd have to count an extra step to disconnect the phone from the mains. We decided not to count an extra step, as we believe that this makes no sense for a mobile device, which keeps all its functionalities without a connection to the mains.*
2.2. Necessary tools to remove spare parts from list 2	1.9	3.8	Both specific (double suction cup, heating plate, pentalobe screwdriver, triwing screwdriver, and hot air) and common tools as necessary for the disassembly of the Iphone 7+ (lever, tweezer, standard screwdriver). For all spare parts we awarded 2 points, except for the front camera, which is not removable.

Total score Apple Iphone 7+ 6,4 /10 5,8 /10

Criterion	Score Apple	Score HOP	Comments
2.3. Characteristics of fasteners for the assembly of spare parts from list 1 and list 2.	5	6.5	*Three types of fasteners are used in the Iphone 7+:* *(1) neither removable nor reusable fasteners (0 points), used for the charging connector, microphone, front camera;* *(2) removable and not reusable (1 point), used for the battery;* *(3) removable and reusable fasteners (2 points), fastening the motherboard.* *There are no other connectors than the charging connector. For instance, to connect headphones, users need an adapter. In line with the official methodology, we awarded the full 2 points for the type of fasteners used for the "connectors".*
3. Availability of spare parts	**9.3**	**7**	*Our lack of information for column A dedicated to after-sales service may have led to an overestimation of the score for the sub-criteria related to spare parts list 1 (3.2 and 3.4) compared to Apple's actual practices, which were awarded only 1.3 points out of 10.* *However, even assuming that all List 2 spare parts are available for more than 7 years for after-sales service, we find a lower score on the List 2 sub-criteria. This difference seems to demonstrate a strong divergence of interpretation on this criterion, because according to the information provided, only the charger is available for the other columns, so a score of 6.5 seems difficult to achieve.*
3.1 Commitment on the availability over time of spare parts from list 2	6.5	4	Except for the charger, Apple does not propose the possibility to purchase any spare parts. Via chat, the Apple agent confirmed that if the device requires hardware repair, only an Apple Store or Apple Authorised Service Centre advisor will be able to repair the device. The purchase of spare parts is not possible. Hence we awarded 0 points in columns D (consumer) and C (repairer) and B (distributors) for all the spare parts from both list 2 and list 1 (except for the charger which earned full points in all columns). In addition, we contacted Apple after sales service to inquire about the availability of certain spare parts. We learned that this information will only be released after inspecting the broken down device. Therefore, HOP could not check the availability of spare parts for column A. Although Apple Service did not reveal any information about the availability of their spare parts, full points were awarded for all spare parts from list 1 and 2 in column A in our calculation of the final score, which might lead to an overestimation of our score.
3.2. Commitment on the availability over time of spare parts from list 1	1.3	2.5	Cf. sub-criterion 3.1.
3.3. Commitment on the delivery time of spare parts from list 2	6.5	4	Cf. sub-criterion 3.1.
3.4. Commitment on the delivery time of spare parts from list 1	1.3	2.5	Cf. sub-criterion 3.1.
4. Price of spare parts from list 2	**18**	**Not checked**	*We contacted multiple repairers authorized by Apple to inquire about the repair costs of specific spare parts. All repairers refused to give us a cost estimate due to confidentiality agreements. Prices will only be revealed once the device has been examined by a technicien of an official Apple Service provider. Hence, we were not able to retrieve the necessary information to perform an estimation of criterion 4. To compute a final score, we used the same score as Apple for criterion 4.*
5. Product-specific	**20**	**17.5**	
5.1.A Information about the different existing updates	10	10	Users can access information about each update before installing it via their phone. Users also have the possibility to skip an update.

Total score Apple Iphone 7+	6,4 /10	5,8 /10	
Criterion	**Score Apple**	**Score HOP**	**Comments**
5.2. Free remote assistance	10	10	Apple provides a forum where repairers can browse for information concerning the iphone, including hardware issues. Thus, full points were awarded in column B (repairers). Full points were also awarded for column C (consumers). Apple provides different types of remote services to facilitate repair, including a chat service, or via telephone.
5.3. Possibility to reset softwares	10	5	*A reset of the operating system is possible (but not possible to do it using only the outside buttons).* According to our technicien, a computer would additionally be necessary for this operation. We were not sure about what firmware is referring to in the case of smartphones. According to a technicien we interviewed, it is important to have access to the boot menu. There, different manipulations such as a reboot of the system, applying an update from the sd card, performing a factory reset, or other tests can be done. For all smartphones we interpreted criterion 5.3.B as the possibility to "access to the boot menu".

Scores in bold (for an entire criterion) are out of 20; scores for sub-criterion are out of 10

Samsung Galaxy A41

Smartphone. Assessment summary

For its Galaxy A41, Samsung computed a repairability index of 8, which is notably higher than our score of 6.6. In our counter-assessment we confirmed the same score for criterion 5 and reached slightly lower scores for criterion 1 (documentation) and criterion 2 (ease of disassembly). A more significant discrepancy appeared in criterion 3 (spare parts availability), for which no spare parts of list 1 were available for purchase. Differences in criterion 4 (price) might be explained by price fluctuations of the Galaxy S41.

Note: Due to a lack of information concerning column A in criterion 3.2. and 3.4., we awarded full points in our calculations. This assumption can lead to an overestimation of the score.

Total score Samsung Galaxy A41	8 /10	6,6 /10	
Criterion	**Score Samsung**	**Score HOP**	**Comments**
1. Documentation	17.7	15.4	Unavailable documents: • 1.1.D - Electronic boards diagrams • 1.1. G - Diagnostic fault and error codes • 1.1. J - Information on how to access data records of reported failure incidents stored on the product 1.1.H - Component and diagnosis information (HOP had doubts about the terminology) 1.1.K - Technical bulletin (Categorically earning full points) *For smartphones, Samsung clearly stands out in terms of documentation availability. Most of the required documents were easily accessible on a Samsung support website which also provides the repairability score, its detailed summary with sub-criteria, and related information about the repairability index. In addition, the chat is accessible for everyone, without the need to indicate a serial number or Samsung account. Between producers, there are large differences in terms of information quality. For the Galaxy A41, Samsung prepared high-quality instructions for repair and extensive information on failure detection. Moreover, Samsung provides useful complementary information such as quality control tests.*
2. Disassembly	**7.5**	**5.8**	*Although Samsung already scores quite low on these sub-criteria, HOP found even lower scores especially on the disassembly and the corresponding number of steps of list 2 parts (2,5 vs 4,2).*

Total score Samsung Galaxy A41	8 /10	6,6 /10	
Criterion	**Score Samsung**	**Score HOP**	**Comments**
2.1. Spare parts from list 2	4.2	2.5	The results for the 4 spare parts of this list which need to be evaluated are: • the front-facing camera - 10 steps (2 points), • the rear-facing camera - 15 steps (1 points), • the battery - not removable (0 points), • the display - not removable (0 points). *The battery is glued. To remove it, one could try to heat the glue on the battery. This is, however, dangerous and could potentially damage the battery itself. Alternatively, one could try to use a lever to pry the battery. Again, this would likely damage the battery. Therefore, our technicien concluded that the battery is non-removable. To reach the display, the non-removable battery would have to be removed. Hence, the display was also deemed non-removable.*
2.2. Necessary tools to remove spare parts from list 2	3.8	2.5	Both specific tools (a curved screen disassembler, double suction cup, heating plate, and hot air) and common tools (a standard screwdriver, tweezers and a lever) are necessary to disassemble the cameras of the Galaxy A41. Both cameras were given 2 points each, whereas the non-removable battery and display earned 0 points.
2.3. Characteristics of fasteners for the assembly of spare parts from list 1 and list 2.	3	4	Three types of fasteners are used in the Galaxy A41: (1) neither removable nor reusable fasteners (0 points), used for the charging connector, the connecteurs, the microphone, the battery, and the display; (2) removable and not reusable (1 point), used for the buttons and speakers; (3) removable and reusable fasteners (2 points), fastening the motherboard and both cameras.
3. Availability of spare parts	16.7	13.6	*On parts availability, we have a strong gap on availability of list 1 spare parts (3.2 and 3.4). We did not find information about any of these spare parts. So we granted by default points for column A only, but 0 for other columns. Samsung, nevertheless, calculated a 7.5 for availability of these parts.*
3.1 Commitment on the availability over time of spare parts from list 2	8.7	10	Samsung is selling spare parts directly to consumers and other interested parties. On a dedicated website, anyone can easily look up the availability, price and estimated delivery time of spare parts. We were able to confirm the availability of all in list 2 included spare parts.
3.2. Commitment on the availability over time of spare parts from list 1	7.5	2.5	None of the spare parts from list 1 were shown on the website. We therefore contacted Samsung directly through the contact formular on the spare part website. After two weeks without response, we followed up with a second request. We received no reply. Hence, 0 points were given in column B (distributor), C (repairer), and D (consumer). We called Samsung service and learned that information about spare part stock is only revealed in a Samsung repair centre after inspection of the device. Therefore, HOP could not check the availability of spare parts for column A. For the calculation of our final score, we awarded full points in column A.
3.3. Commitment on the delivery time of spare parts from list 2	9	6	On the day of our assessment (11.01.2022) Samsung displayed the following delivery times: • Charger: immediately (full points); • Ecran: immediately (full points); • Battery: immediately (full points); • Camera back: 3 weeks (0 points); • Camera front: 2 weeks (0 points) We ordered a charger on December 29, 2021. It arrived quickly on December 31, 2021 (full points).
3.4. Commitment on the delivery time of spare parts from list 1	7.5	2.5	0 points were awarded for all other spare parts in column B (distributor), C (repairer), and D (consumer), because they were not available for purchase. Although we could not verify column A, full points were awarded for all spare parts from list 1.

Total score Samsung Galaxy A41 8 /10 6,6 /10

Criterion	Score Samsung	Score HOP	Comments
4. Price of spare parts from list 2	18	11	On January 1, 2022, Samsung displayed the estimated price for its spare parts: Display: 78,77 € Front camera: 32,47 € Rear camera: 53,80 € Battery: 28,46 € Charger: 17,75 € According to the website Mobidocs, the original price was 299 euros. *We are not totally sure about the accuracy of this source and acknowledge that if the release price was higher, then the score would improve. Yet, to achieve the score displayed by Samsung, the price would need to increase to 450 Euro. It would highlight an inherent weakness of the (static) repairability index, which is not considering price changes, even though they might be significant. Another explanation may be the price of the parts we used. We have used the Samsung consumer price, but a different pricing scheme may have been used by the manufacturer if the majority of parts sales are made with other types of stakeholders than consumers.*
5. Product-specific	**20**	**20**	
5.1.A Information about the different existing updates	10	10	When an update is provided, users have the possibility to skip it and gather complementary information about its nature.
5.2. Free remote assistance	10	10	Repairers can find extensive information about how to repair the Galaxy A41 on Samsung's website. Chat and telephone support are available to help consumers with technical issues.
5.3. Possibility to reset softwares	10	10	According to our technicien, a reset of the operating system is possible, using the outside buttons. The boot menu can be accessed using the outside buttons.

Scores in bold (for an entire criterion) are out of 20; scores for sub-criterion are out of 10

Vivo Y21s

Smartphone. Assessment summary

The smartphone Vivo Y21s has a repairability index of 7.6. In our counter-assessment it scored 6.3.

We found lower scores for the documentation, the ease of disassembly, and the availability and price of spare parts. Differences in criterion 4 (price) might be explained by price fluctuations of the Vivo Y21s.

Total score Vivo Y21s	7,6 /10	6,3 /10	
Criterion	**Score Vivo**	**Score HOP**	**Comments**
1. Documentation	15.4	12.3	Unavailable documents: • 1.1.C - Wiring and connection diagrams • 1.1.D - Electronic boards diagrams • 1.1.H - Component and diagnosis information (HOP had doubts about the terminology) • 1.1. J - Information on how to access data records of reported failure incidents stored on the product • 1.1. L - Guidance for self-repair • 1.1. N - Failures detection and required action 1.1.K - Technical bulletin (Categorically earning full points) *Some documents, such as the repair manual or the error codes, are not available on Vivo´s website. We contacted Vivo via chat and asked for them. The documents were finally provided, but only after a second specialist joined the chat. We consider this to be an unnecessary obstacle to repairability. We believe that not all consumers or repairmen would make the effort to contact Vivo to retrieve documents not found on the website. The ease of access to documents is not considered in the repairability index.* *No guidance for self-repair was found, because no safety instructions were provided in the repair manual.*
2. Disassembly	**16.7**	**13.3**	*Overall, the disassembly was rather easy and straightforward for our technician.* *Yet, one observation stands out: stickers were put on certain screws. These stickers are demolished in the process of removing the screw. According to our technician, they serve as evidence of disassembly and indicate to manufacturers if the consumer or an unauthorized party has opened the device within the guarantee period. The problem for repair is that covering screws can lead to unintended damages on the devices. This is especially problematic when consumers or technicians are not familiar with a recent device yet and try to open it to remove a part. Such elements, making the repair unnecessarily more difficult and are not covered in the repairability index.*
2.1. Spare parts from list 2	9.2	5.8	The results for the 4 spare parts of this list which need to be evaluated are: • the battery - 6 steps (2 points), • the display - 13 steps (1 points), • the front-facing camera - 6 steps (2 points), • the rear-facing camera - 9 steps (2 points)
2.2. Necessary tools to remove spare parts from list 2	5	5	To disassemble the five spare parts from list 2, our technicien needed: a cutter, a common screwdriver, a lever and a sim card extractor. The sim card extractor is a specific tool.
2.3. Characteristics of fasteners for the assembly of spare parts from list 1 and list 2.	10	10	All fasteners used in the Vivo Y21s are removable and reusable fasteners, although some screws were covered by a sticker as we previously described.

Total score Vivo Y21s	**7,6** /10	**6,3** /10	
Criterion	**Score Vivo**	**Score HOP**	**Comments**
3. Availability of spare parts	7.5	5.7	*We found similar scores to Vivo for the sub-criteria related to parts availability. Yet, the scores for the sub-criteria corresponding to the delivery times calculated by Vivo seem to us to be too high and in contradiction with the method. If spare parts are not available in columns 3.1 and 3.3, then the corresponding columns 3.2 and 3.4 should also be equal to 0.*
3.1 Commitment on the availability over time of spare parts from list 2	2.9	3	*Vivo currently does not sell any spare parts directly to consumers or repairers. Only professional repairers can buy some spare parts at Modelabs Mobiles, a French wholesaler. Still, we awarded 0 points to column B (retailer), because our interpretation is that the access of spare parts via a retailer should be without excluding certain stakeholders of the market. On the contrary, the charger is available at retailers for any stakeholder (full points in column B).* Vivo confirmed, that all spare parts are available in their official repair centres, where consumers must count around 3 days for the repair and return (full points in column A).
3.2. Commitment on the availability over time of spare parts from list 1	2.7	2.5	Cf. sub-criterion 3.1.
3.3. Commitment on the delivery time of spare parts from list 2	6	3	For all spare parts full points in column A; 0 points in columns B, C, and D. Except the charger earns full points in column B. (cf. sub-criterion 3.1.)
3.4. Commitment on the delivery time of spare parts from list 1	7.1	2.5	Full points in column A; 0 points in columns B, C, and D. (cf. sub-criterion 3.1.)
4. Price of spare parts from list 2	**16**	**13**	Vivo displays the estimated price for its spare parts on its website: • Display 54 € • Front camera (8MP) 10 € • Rear main camera (50MP) 18 € • Battery 23€ To retrieve the price of the charger, we used the prices from Boulanger: 24.99€ At the day of our calculation (23.12.21) the Vivo Y21s was priced at 199 € in Fnac Darty. This price is the result of a 9% discount. In our calculation we used the original price of 219 Euro, which we assumed to be a very close approximation of the price when the smartphone was released in September 2021. Using these parameters, we calculated a score of 6.5 out of 10 for criterion 4. *Again, we are aware that our calculation is potentially done under different conditions from the initial calculation and that this may have consequences on our result, but with the information available to date, we find a lower score.*
5. Product-specific	**20**	**19**	
5.1.A Information about the different existing updates	10	10	When an update is provided, users can go to «Settings» and «System update», and then click on the version where it tells the user what has been fixed or added in the updated version. Users also have the possibility to skip an update.
5.2. Free remote assistance	10	8	In column B (repairer) the Vivo received 0 points. We did not find any information facilitating the detection of a breakdown or how to repair it on their website. Full points were awarded for column C (consumers). Vivo provides different types of remote services to facilitate repair, including a chat service, or via telephone.
5.3. Possibility to reset softwares	10	10	*A reset of the operating system is possible (but not by using only the outside buttons).* According to our technicien, the boot menu can be accessed.

Scores in bold (for an entire criterion) are out of 20; scores for sub-criterion are out of 10

Conclusion

1. For us, some of these scores seem controversial. Although in reality very poor scores in key criteria such as disassembly or spare parts availability and price would make repair impractical, such a product can currently still reach a good overall score, as poor scores in one criterion are compensated by other criteria. This compensation effect was observed for multiple devices that we have counter-assessed. For example, for both Apple devices and the Samsung smartphone we observed good (above 6/10) and even very good (8/10) overall scores. However, the disassembly of all three devices was seriously hindered by welded or glued spare parts, making some failures non-repairable. Likewise, we consider Vivo Y21s` good score of 7/10 controversial, as Vivo does not commercialise any spare parts, and thereby blocks the repair of independent professional repairers and consumers themselves. Similar concerns can be raised for the Philips TV scoring an overall good 7 out of 10. Although we could not verify the prices for each spare part, Philips low score of 7/20 for spare part prices seems to suggest that the price could impede the repair of certain spare parts in reality. In sum, these findings suggest a need to review the weighting system of the repairability index.

2. We found almost systematically lower scores except for one product. The differences we obtained amount to 1.3 to 1.5 points out of 10 for three of the six products examined. In some cases, these differences would change the colour of the index, which might have a major impact on the consumer behaviour.

3. More importantly, in some cases we found strong indications that some producers did not strictly follow the instructions manual. In particular on criterion 3 (availability of spare parts), we have observed unreasonable high scores. This is worrying because this criterion fully relies on the producers' commitments, and, in our opinion, needs more transparency from them (cf. section 4). Furthermore, document availability (criterion 1) was also often overrated. On the contrary, overall we found more or less similar scores on criterion 2 (ease of disassembly).

4. Some elements of the instructions manual need further clarifications (which will be elaborated in part 4), to ensure a uniform interpretation by all actors and guarantee a fair competition.

5. A genuine control of repairability index by the market is hardly feasible. Depending on the producer, some information is more or less accessible and therefore verifiable. Hence, commitments on the availability of spare parts over time are almost never specified, and often a spare parts catalogue is not readily available. Criterion 4 (price of spare parts) is impossible to check correctly due to confidential data. In addition, without the detailed original calculation grid it is not possible to identify the exact origin of detected variances. We believe that even the control of official authorities may have its limits. Due to limited resources, we fear that they will too often depend on the information given by manufacturers. However, as we saw, verifying producer declarations requires interactions with all stakeholders concerned to genuinely check producer practices (such as giving independent repairers access to spare parts or not).

6. Some specific obstacles to repair are not yet accounted for in the repairability index. These obstacles include, for example, the ease of access to documents, the quality of provided documents, or the amount of fasteners used. Large differences can be observed between product models, which can affect the repairability of a product. Overall, we believe these unaccounted obstacles provide hints as to how to further improve the ambition of the index and the quality of the information given to the consumer (which will be elaborated in part 4).

Table 1. Summary of the counter-assessment per product

Acer A317	According to our assessment, Acer´s repairability score of 8.2 seems justified. There are some differences, but none of them seem to result in a major difference of interpretation. Rather it seems Acer has a stricter understanding than our assessment method for remote assistance and possibility to reset softwares sub-criteria, highlighting the need for clarification on these two points.
Apple MacBook Pro A2141	We calculated a slightly less favourable index than Apple. In particular, we consider Apple´s score for spare parts and documentation availability dubious. Following our interpretation of the instructions manual it is overestimated. In this case, the slight score difference becomes important, as it allows Apples to display a green repair logo instead of a yellow one.
Philips 50PUS8546	For this TV we detected an overall unfavourable variance of 1.5 (the biggest difference among the 6 assessed products). Significant differences have been detected in criterion 1 (documentation) and criterion 3 (spare parts availability), raising questions about Philips interpretation of the official methodology.
Apple Iphone 7+	Small differences in criterion 1 (documentation), criterion 3 (spare parts availability) and criterion 5 account for an overall unfavourable variance of 0.6. Yet, given some generous methodological choices from our side due to a lack of information, we consider this repairability index could be overestimated. In particular, we noticed a different interpretation from ours on criterion 3. Overall, the slight score difference becomes important, as it allows Apples to display a green repair logo instead of a yellow one.
Samsung Galaxy A41	A significant unfavorable variance was detected in criterion 4, but is possibly explained by price fluctuations. The remaining criteria account for an overall unfavourable variance of 0.7, which, given our methodological choices taken, we consider to be an overestimation of the repairability index. In particular, we found a 3 points discrepancy in criterion 3, which is well documented on the manufacturer's website.
Vivo Y21s	For each criteria we calculated in varying degrees a worse score than Vivo, amounting to an overall unfavourable difference of 1.3. Although some differences could be due to a significant price decrease of the Vivo which we would not have accounted for or due to some of our assumptions, but overall, we could not explain the score declared by Vivo, highlighting the need to inquire Vivo about their interpretation of the instructions manual.

Overall, HOP did not find any major aberrations in the scores examined. Still, variances amounting to 1.5 points out of 10 emerged for 5 out of 6 products. In all of these cases, manufacturers declared better scores than ours. **HOP is particularly worried about the variances corresponding to criteria assessing the manufacturer's commitment to the availability of documentation and spare parts.**

According to HOP, these differences are due to one or a combination of the following explanations:

- Too generous self-rating of manufacturers
- A lack of information, for instance, for Samsung we did not find any information regarding spare parts from list 1, nor did Samsung reply to our emails.
- A lack of clarity in certain instructions for the calculation, which opens the way to divergent interpretations.

HOP does not pretend that the outcomes of its calculations should be taken at face value. In practice (and as explained above in our method section) certain practical methodological choices had to be made in the face of imperfect access to information. Nevertheless, we are convinced that our scores reflect a good estimate of what a consumer or repairer can expect to obtain if they want to access the information used to calculate the index on their product. These results show the need for further clarification of the method, and for official controls to ensure that the commitments made by manufacturers to obtain points are followed in practice.

Part 4.
Inside the repairability index: needed clarifications & HOP's recommendations

During our interviews and counter-assessment, we noticed that some criteria need further clarification to avoid all ambiguity and ensure a coherent application of the methodology among all manufacturers. In addition, we identified concerns regarding the index'ambition and its transparency; and other more diverse repairability issues specific to certain (sub-)criteria. This section summaries our findings and presents our suggestions for the public authorities.

General observations

A. The index should be refined over time and contribute to improving current producers' practices

As we already saw, the repairability index was implemented in 2021 for the first five product categories considered as pilots and will progressively be extended to other categories. This notion of a pilot is important because it implies that:

- The index is not perfect;
- The index is not fixed and shall be subject to revision and improvements.

However, we noticed that **the methodological choices made for the first five product categories are strongly affecting the work on the new product categories**. For example, in the recent working group for the new product group washing machine (top-loading) the proposition of having more ambitious thresholds for evaluating the disassembly (criterion 2) has been rejected due to an inconsistency with the disassembly thresholds previously set for front-loaded washing machines (which were part of the first pilote products). This can be problematic in cases where controversial choices have been made in previous working groups. Indeed, we observed a lack of discrimination among the scores of front-loaded washing-machines (cf. part 2). While HOP acknowledges the need for consistency between product categories, we are in favour of harmonising upwards rather than downwards.

This means, when the repairability index is extended to new product categories, **we advocate for a systematic arbitration for the most ambitious choice, and subsequently change the parameter in question for products having already a repairability index.** Otherwise, we think the index is stuck in unfavourable past choices and no learning and improvement can materialise.

We also noted that **two opposing positions tend to emerge during working groups** on the extension of the index : the first, considering that the index should be as ambitious as possible; the second, advocating the index should be based on current mainstream practices. For example, while determining the scoring thresholds for the availability of spare parts (criterion 3), certain manufacturers were in favour of aligning them with manufacturers' average current practices in terms of spare parts availability, whereas HOP believes that these scoring thresholds should at least correspond to the average product lifetime or be aligned with the best practices in the market.

For HOP and other repair sector actors, **it is clear that the index should go beyond the description of current practices, and encourage innovative eco-design**. Otherwise, we fear that the index will not be discriminatory and lack an incentive to rethink product design.

B. Measures are needed to ensure the transparency of the index, which is key to consumer confidence

1. A public website is needed to collect and display the repairability index.

To date, no database exists which gathers all repairability indices across all product categories. As mentioned in part 2, Spareka, a private company, quickly took the initiative to launch a website for this purpose, but they do not have the means to update it on an ongoing basis, nor to oblige manufacturers to transmit their scores to them. Yet, such a database would provide multiple benefits for several stakeholders:

- to provide access to the exhaustive list of scores by product, facilitating consumers the comparison of products;
- to increase transparency and competition among manufacturers around eco-design;
- to provide robust statistics, informing about the index's evolution and score distribution for future adjustments, such as scoring thresholds;
- to enable a real "control by the market" wished by the French government;
- to ensure access to the index of a product that is no longer sold, informing the consumer about its reparability not only at the time of purchase but also at the time of failure;
- to observe and monitor the reparability of a product category over time.

Due to equity and transparency concerns, **this platform should be operated by the government or a public agency**. The European energy label and the EPREL database[36] can serve as a role model.

To accelerate the diffusion of the index, **the submission of the repairability indices to such a public platform should be made mandatory for producers**. Otherwise, we fear that public authorities with limited resources might become overwhelmed with the collection of published scores, which is what has occured to Spareka.

36 https://ec.europa.eu/info/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/product-database_en

2. The completed and detailed calculation grid file must be made accessible

To date, producers only have to provide a summary of their calculation[37] (cf. figure 17).

Figure 17. Summary of the index´ calculation

Criteria	Sub-criteria	Score of subcriterion /10	Weighting factor of subcriterion	Score of criterion /20	Total criteria scores /100
Documentation	1.1 Availability of the technical documentation and other documentation related to user and maintenance instructions	X/10	2	X/20	X/100
Criterion 2 : Disassembly, accessibility, tools, fasteners	2.1 Ease of disassembly parts from List 2*	X/10	1	X/20	
	2.2 Necessary tools (List 2)	X/10	0.5		
	2.3 Fasteners characteristics parts from List 1** and List 2	X/10	0.5		
Criterion 3 : Availability of spare parts	3.1 Availability over time parts from List 2	X/10	1	X/20	
	3.2 Availability over time parts from List 1	X/10	0.5		
	3.3 Delivery time parts from List 2	X/10	0.3		
	3.4 Delivery time parts from List 1	X/10	0.2		
Criterion 4 : Price of spare parts	4. Ratio between price of parts from list 2 to the price of the product	X/10	2	X/20	
Criterion 5 : specific criterion	5.1 Accessibility of usage-counter to consumers	X/10	1	X/20	
	5.2 Free remote assistance	X/10	0.5		
	5.3 Possibility to reset softwares	X/10	0.5		
Reparability index					X/10

Useful and important information is missing, for example, the producers´ commitments about the availability of each spare part. Only a global score is given, summarising the producer commitment for all spare parts.

This score out of 10, engenders a **limited comprehensibility of consumers**, as it lacks a meaningful unit of measurement. For example, consumers are not able to translate a score of 7 out 10 in spare parts availability into the number of years that a spare part will effectively be commercialized by the producer. This, in turn, leads to an additional problem of accountability, since consumers (or repairers, competitors, and civil actors) cannot hold the manufacturer accountable if, for instance, some parts become unavailable at one point. This is **a crucial obstacle to "the control by the market"**.

In addition, as we saw in part 3, today, some sub-criteria are very complex or impossible to check. Having the completed and detailed calculation grid (cf. figure 18) would facilitate verifying a repairability score. If a variation in the score is found, it would allow accurately and quickly identifying the specific parameter causing this variation, without demanding the supporting documentation. For some products, we requested the completed and detailed calculation grid. However, our request was denied. Moreover, whistleblowers could make the DGCCRF aware of anomalies observed in the market and allow the DGCCRF to investigate a precise issue without the need to check all criteria.

37 "fiche d'information", cf. art. 541-9-2 of the environment code)

Commitment on the availability over time of spare parts (in years)		Column A Producer		Column B Spare parts retailers		Column C Repairers		Column D Consumers			
List 2 : Broken /malfunctioning parts		Duration of availability	Sub-total	Duration of availability	Sub-total	Duration of availability	Sub-total	Duration of availability	Sub-total		
3.1.A	Battery	if X ≥ 7 years	7	if X = 5 years	5	if X = 5 years	5	if X ≤ 4 years	0		
3.1.B	Display device	if X ≥ 7 years	7	if NA or X ≤ 4 years	0	if NA or X ≤ 4 years	0	if X ≤ 4 years	0		
3.1.C	Front-facing camera	if X ≥ 7 years	7	if X = 5 years	5	if X ≥ 7 years	7	if X ≤ 4 years	0		
3.1.D	Rear-facing camera	if X ≥ 7 years	7	if X = 5 years	5	if X ≥ 7 years	7	if X ≤ 4 years	0		
3.1.E	Charger	if X ≥ 7 years	7	if X = 5 years	5	if X ≥ 7 years	7	if X ≤ 4 years	0		
			35		**20**		**26**		**0**	**81**	**/140**
Total sub-criterion 3.1										**5.8**	**/10**

Figure 18. Extract of a completed and detailed calculation grid for criterion 2.1. (availability of spare parts form list 2) for smartphones (excel file)

We also remind that the summary of the calculation grid (figure 17) is, in violation of the legal obligation, not always available[38]. However, we found that 62% of the people who noticed the index during their purchase have examined the scores of the five different criteria. This shows that **consumers are interested in understanding the score more in detail**.

Therefore, **we urge public authorities to oblige producers to make the completed and detailed grid openly accessible, and not upon request**. Here we refer to the file that all producers have to fill out to calculate the score for their product (cf. figure 18).

In relation to the point made earlier, we suggest, **we suggest that these completed and detailed grids are accumulated on a public platform. The submission to this platform should be made mandatory for producers** to avoid overloading one individual actor and accelerate the index´ diffusion.

C. The weighting of some (sub-)criteria should be reviewed to strengthen the index´s ambition

As indicated in part 3, the final score is the average of the five main criteria, each given equal weight.

⟶ **HOP suggests that the weighting system be reconsidered to avoid compensation effects in the case of key failures**.

For numerous products with a good (>6) or very good (>8) overall score, we observed that they have a very poor score on one of the five criteria. This is possible, as this poorly rated criterion is compensated by the other well-rated criteria. For example, **HOP has identified devices with a final score of more than 8/10 but with a disassembly score (criterion 2) of less than 7/20**; or devices with a final score superior to 7/10 but with less than 5/10 for spare parts availability (criterion 3)[39].The problem is that some criteria constitute absolute barriers to repair (i.e. availability of spare parts; their price; or the ability of the product to be dismantled). In practice, a barrier means a chance of repair close to 0 , which is not compensated by other factors. Apart from HOP, there are other actors,[40] [41] which have pointed out this problem and its potential to mislead consumers. Weighting is therefore a crucial issue to reflect the reliability of the score on the real repairability of the product, and ultimately to avoid a deceptive effect on the consumer.

38 UFC Que Choisir - INDICE DE RÉPARABILITÉ Une indispensable réforme pour le crédibiliser

39 Respectively mobile phones Galaxy S20 from Samsung and Redmi Note 10 Pro from Xiaomi

40 UFC Que Choisir - INDICE DE RÉPARABILITÉ Une indispensable réforme pour le crédibiliser

41 Leroy Merlin proposal to make some criteria interdependent (cf below)

HOP identified several ways to tackle this issue:

Option 1 : Differentiate the weight assigned to each criterion by giving more importance to key ones

Whereas at present the five criteria have the same weighting, this would mean to give more importance to criteria that are key barriers for repair: C1 Documentation 15%; C2 Disassembly 25%; C3 Availability of spare parts 25%; C4 Price of spare parts 25%; C5 product-specific 10%.

- \+ Operationally simple
- \- Compensation effect is still possible to a certain degree

Option 2 : Introduce a minimum threshold mechanism for certain criteria

One way to eliminate the compensation effect would be to introduce a minimum threshold per key criterion. If one of the key criteria remained below that threshold, the overall score would be penalized. In such a case, we propose to have a score below 6, to avoid having a green repairability logo. In other words, it would be impossible to have a high overall score if a key criterion gets a very bad rating.
Potential key criteria: spare parts availability; price; and disassembly

- \+ Limit compensation effect
- \+ Encourage producers to improve all aspects related to the repairability of their product
- \- The choice of thresholds is somewhat arbitrary

Option 3 : Introduce an interdependent relationship between certain criteria

This proposal is linked to the previous one. Unlike the current method which treats criteria as independent, we would consider them interdependent. For instance, criteria 1 (documentation), 2 (ease of disassembly) and 3 (availability of parts) could be linked in such a way that if the score of one of these criteria is below 10/20, a penalty is applied, reducing the scores of the other two criteria (for example 50%). This approach has been suggested by a distributor (Leroy Merlin), which considers that the index is not discriminatory enough.
In part, such an interdependence between certain criteria is already acknowledged in the index: criterion 4 (price of parts) is to be equal to 0, in case that some spare parts from list 2 are not available (criterion 3).

- \+ Limit compensation effect
- \+ Encourage producers to improve all aspects related to the repairability of their product
- \- The choice of thresholds is somewhat arbitrary

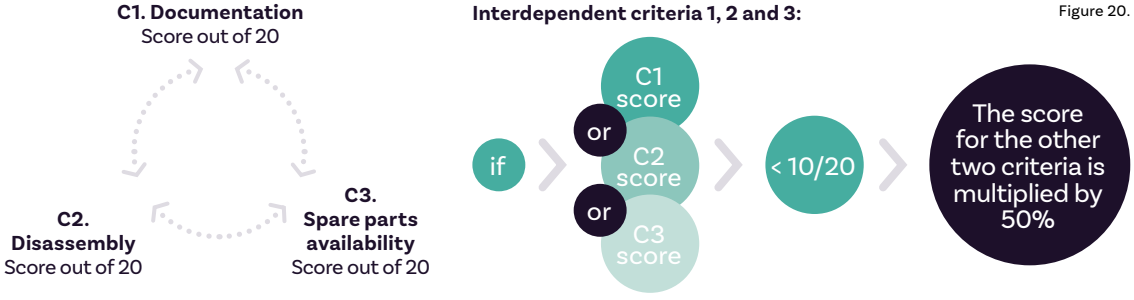


Figure 20.

Option 4 : Review the structure of the grid by introducing a spare part logic

An overall score would be calculated per spare part, including a) disassembly, tools and fasteners; b) availability and delivery period; and c) price.

- The product, not the sum, of these three criteria would be calculated for each part;
- The cube root of this product would determine the overall score of each part;
- 75% of the repairability index would be determined by averaging the scores per spare part, using a different coefficient for spare parts from list 1 or 2;
- The remaining 25% would account for the documentation and specific criteria.

+ Multiplication removes the compensation effect between different criteria (especially if one of the parameters is set to 0, for instance if a part is impossible to disassembly, the global score for the part would be 0)

+ Scoring the repairability of spare parts is closer to reality, informing consumers about the ease per specific act of repair

- Would ask to revise the grid in a consistent manner

A repairability score calculated by parts counting for 75%

A complementary score counting for 25%

For each part : repairability of part A is calculated such as : $R_A = \sqrt[3]{a * b * c}$

After these general observations, we continue to reveal our findings and recommendations per criteria.

Criterion 1. *Documentation*

1. The denomination of certain documents listed in criterion 1 (documentation) deserve clarifications from the public authorities

- **1.1.D Electronic board diagrams**

There is no specification in the instructions manual nor in the calculation grid. It appears that the scope of what this term should cover differs among some stakeholders. While some manufacturers consider this information to be covered by providing a simple photo of the electronic card, repairers insist on the need to include further elements such as the circuit diagram.

We recall that the purpose of this document is to facilitate the repair of spare parts. To do so, repairers need to understand the different functions performed by an electronic board and need to have access to the following information:

- The unequivocal identification of each component - through standardised symbols, type, value and characteristics
- All the connections between components
- Specification of the various voltages and signals which enter and leave the card via its links with the exterior (connectors for example).

So far, the repair of components has been largely ignored in the index. Yet, from an ecological point of view, this should be the first action to consider. Furthermore, even from an economic perspective it makes sense to foster repair of components for certain spare parts such as the motherboard of a smartphone. For instance, whereas out-of-warranty repairs by Apple can amount to 599 Euro for a motherboard[42], repairing the defect component on the motherboard can be much cheaper (about 150 Euro, depending on the availability of electronic board diagrams). Indeed, the availability of the electronic board diagrams is the only criterion of the index related to the repair of components. Unfortunately, most of the time it is not provided by the manufacturer.

42 https://support.apple.com/iphone/repair/service

→ **To acknowledge its importance and to incentivise producers to provide it, we suggest electronic board diagrams have a higher weighting factor in the index.**

- **1.1.H Component and diagnosis information**

In our counter-assessment we were confronted with the ambiguity of this terminology. During interviews, we noticed that even professional techniciens interpret this term differently. Interpretations range from a decision tree to identify failures to the reference number of individual components.

2. The ease of access to documents is not accounted for in the index

The ease to access certain documents is very different from one manufacturer to another. As described in our counter-assessment, some documents are not available on the producers websites and can only be retrieved after contacting the technical assistance. Moreover, some producers did not respond to email inquiries. That means that the availability of certain documents depends on the producers´ service hours, discreciencies to reply, and possibly the availability of certain specialists. During the counter-assessment of the Vivo Y21s, for example, we needed to wait for a second agent to join the chat before we received access to the required documents.

→ **We propose to include "ease of access to documents" as another sub-criterion in criterion 1.**

In addition, we want to draw attention to the fact that **information should be made available for free**. Yet, in some cases, we had to provide personal information (name, email address, residence, phone number, etc.) before entering the chat. In general, such sensitive information can and is used by companies for marketing purposes. Therefore, we consider that the information provided is not free.

→ **We propose to include the "free access without the need to reveal personal information" as an additional element in criterion 1.**

Building on our previous point, it could be measure as follows:

Information available on the producer´s website	**4 points**
Information available through the customer service without the need to reveal personal details	**1 point**
Information available through the customer service with the need to reveal personal information	**0 points**

3. Information on access to independent professional repairers

Despite the fact that the instructions manual encourages producers to mention at least the repairer directories listed by Ademe, none of the procedures we assessed did this.

→ **We propose to make the reference to repairer directories listed by Ademe mandatory to get points for parameter 1.1.M**

We believe that this would facilitate the search of independent repairers for consumers.

A need to embrace innovative formats

During our interviews repairers confirmed that they prefer to watch video tutorials instead of technical manuals. They consider videos to be much richer in information, for example revealing

potential pitfalls of disassembly such as hidden screws (which we also encountered in our counter-assessment).

⟶ **We propose to include "video tutorials for the disassembly of specific spare parts" in the repairability index (measured as present on the manufacturer's website vs not present).**

At first, these videos might concern only the disassembly of spare parts from list 2. It is important to ensure that the manufacturers are the owner of the videos, so that no third-party can interfere with the availability of the video. To do this, producers could either do these videos themselves or outsource them. Overall, we believe that these tutorials would encourage self-repair and facilitate the repair of new product models for professional technicians.

4. Some documents are more important than others, yet they have less impact on the index

Fundamentally, all documents are given an equal weight. However, documents 1.1. L - 1.1.O only concern column B (consumer), which makes them effectively less impactful on the overall calculation. Yet, we believe that they are crucial for consumers, especially for the maintenance, failure detection and repair of the device.

⟶ **We suggest doubling the weighting factor of 1.1. L - 1.1.O to ensure that all documents have an equal impact on the repairability index.**

5. The calculation grid and instructions manual leave room for interpretation of column A

As described in part 3 data collection and analysis, we believe it is necessary to specify that column A (repairers) in criterion 1 includes independent repairers. So, documentation only available internally (e.g., to authorized repair centres) earns 0 points.

Criterion 2. *Disassembly*

1. The methodology for counting the steps of disassembly (criterion 2) needs some clarifications to avoid differences in interpretation:

- **A** The method stipulates that the removal of a part or a tool change are actions constituting the end of a step, but not the grabbing of a tool. After removing spare part X (constituting the end of a step) using tool A, does grabbing tool B to remove spare part Z constitute a tool change? During its counter-assessment, HOP did not count an additional step for grabbing tool B. However, we consider that this point should be clarified in the instructions manual, as the graph in the manual can be interpreted both ways. We think a video illustrating an example could minimize the risk of diverse interpretation.
- **B** Does disconnecting or unplugging a spare part, without formally removing it, count as an additional step? We have been confronted with this issue on several occasions with regard to connectors and did not count an additional step for this action.
- **C** Where more than one type of fastener has to be removed to access a part, which one has to be taken into account in the calculation (criterion 2.3)? We believe that the most penalising type of fastener should be used in calculation.
- **D** Does the directive to begin the counting of disassembly steps with the device connected to the mains apply for all product categories, including mobile devices such as smartphones? In our counter-assessment of smartphones, we did not count a step for this.

2. Relationship between permanent fasteners and the removability of a spare part

In the instructions manual, the Ministry introduces the term "permanent" fasteners, such as welds and glues. Yet, in the evaluation grid the terms "(non)-removable" and "(non)-reusable" are used. Does it follow that all permanent fasteners are always "neither removable nor reusable" (criterion 2.3) ?

For instance, this is very important for smartphones and laptops where **we found many glued and welded spare parts**. In our counter-assessment, we considered permanent fasteners as non-removable earning 0 points. By heating the glue, some spare parts could be accessible in theory, however the disassembly process would likely engender damages on the device.

→ **We believe a clarification with regards to the term "permanent fasteners" is needed, specifying that they are non-removable and non-reusable.**

Additionally, if a spare part is fastened with a non-removable fastener (sub criterion 2.3), such as welds or glues, should we consider that the spare part is also non-removable (sub-criterion 2.1)? Some producers might argue that it is possible to unweld a spare part with specific equipment; or to remove a glued spare part by heating up the device. Again, such operations are likely to engender damage to the product, especially in the case of consumers performing them. We are thus in favor of considering all spare parts fastened with a non-removable fastener as non-removable. As a consequence, devices with glued or welded spare parts will be strongly penalized in the index. We believe that this would encourage manufacturers to use non-permanent fasteners such as screws or clips, which significantly facilitates the disassembly and accessibility to spare parts.

3. The terminology of certain spare parts for smartphones needs further clarification:

- Which «buttons» are meant (volume, power, main button, or all of them)?
- Which «microphone» is meant (rear microphone, button microphone, receiver/front microphone, another to cancel background noise, all of them)?

4. The pertinence of certain spare parts in list 2 and their assessment of disassembly should be reviewed

Laptops

As it has been done for other products such as the smartphone, we think the charger line should be greyed out for sub-criterion 2.1, 2.2., and 2.3. In fact, there is no issue related to the disassembly of the charger but only for its availability or its price.

NB: *Greying out a line does not remove any points from the score, but simply removes a part from the calculation of a sub-criterion. The spare part will remain part of list 2 and be considered in other (sub-)criteria.*

Smartphones

We think the presence of the charger in list 2 is questionable. Indeed, this part is not prone to failure, has no issues related to disassembly, or price, nor for its availability as it is a universal part for most brands. Thanks to that its supply is not in the hands of a given producer.

→ **For this reasons, we suggest to remove the charger from list 2, microphone could be added instead**

Criterion 3. Spare parts availability

1. There are still grey areas regarding the availability of spare parts, which some manufacturers take advantage of

There are several accounting logics in criterion 3 for columns A, B, C and D. For example, some manufacturers see them as interdependent and award themselves points in every column as soon as they sell spare parts to retailers. They seem to consider that these spare parts are then also available to repairers and consumers via retailers, although they do not directly deliver them to all stakeholders concerned.

For HOP, the fact of having several columns in the calculation grid is incompatible with this interpretation. We were confronted with such a case in our counter-assessment, and decided not to award points for columns C and D when the producer referred to a retailer to access certain spare parts.

The problem we see is related to the producer's commitment to make spare parts available over time to consumers and repairers. How can a producer inform about its commitment if it relies entirely on a third-party retailer? Indeed, the retailer decides about its inventory. What if it decides not to sell some spare parts anymore?

⟶ **Award points only when spare parts are available indiscriminately and unconditionally for all retailers in column B**

The index grid always indicates the term «retailers» in plural, suggesting all retailers should have access to spare parts from the producer, which seems relevant to increase reparability. Nevertheless, in some cases certain retailers have the exclusivity to distribute the producers's spare parts.

- We consider public authorities should precise in the instruction manual that points in column B can be granted only if the availaibility of parts for retailers is non-discriminatory among them. In case only one (or a few) retailers can access the parts 0 points should be granted. In addition, the availability of parts must also be unconditional, i.e. retailers must be able to resell the parts to anyone without restriction.
- Lastly, we think **a territorial clarification should be added in the "retailer" definition** to prevent the case where a manufacturer would get points only for retailers located outside of France.

This case constitutes a significant barrier for ordering parts, especially if the retailers are located outside of Europe (language, delivery price, ...).

NB : Our point is not to force a producer to have retailers in France, which we know would not be legal, but only to grant no point for retailers located abroad in column B (remember that the index is not prescriptive).

⟶ **Award points only when spare parts are provided directly and available to all repairers in column C**

Concerning some product categories, it seems that for now, few manufacturers supply spare parts directly to independent repairers. These repairers usually go through a retailer, when possible, or manage to collect second-hand parts.

For the index, the instruction manual states that *«in the event that the producer or importer does not make spare parts directly available to independent repairers, then points are not awarded in column C for criteria 3.1, 3.2, 3.3, 3.4"*. This means if a producer supplies only authorized repairers and no independent ones, then he should get 0 point in column C. Yet, we observed some cases where a producer does not supply spare parts to independent repairers and awards its product more than 15 points for criterion 3, which is impossible with a 0 points in column C.

We urge public authorities and in particular the DGCCRF to **ensure that independent repairers are directly concerned by the availability of spare parts so that a manufacturer can claim the points in the corresponding column.**

For example :

- *In our counter-assessment, we found lower scores than Apple or Philips for the spare parts availability (criterion 3). We believe that these producers award themselves points in columns where they should get 0 because they deliver spare parts only to their internal repair service.*
- *According to the testimony from a repairer, many Sony TVs obtain top scores in spare parts availability (criterion 3). This should not be possible, as Sony does not supply parts directly to repairers. Instead one has to go through an intermediary.*

The examples above reveal the weakness of the current terminology. While the spirit of the index suggests rating the guaranteed «access» to parts for different stakeholders, the term «availability» has been retained. The difference is slice, but a producer may consider keeping spare parts available for some (but not all) repairers without having provided a delivery system,

and then award itself the points without delivering parts to repairers who actually need it. HOP advocates to **change the terminology from "spare parts availability" to "spare parts accessibility"in the grid and instructions manual to prevent this kind of interpretation and increase the index' ambition.**

- We believe that we identified **a typo** error and ask public authorities to correct a sentence in the instruction manual to make it consistent with the instruction quoted above:

"in the event that the producer or importer ~~does not have~~ has an approved repairers network, the points are awarded based on the most penalizing practices towards independent repairers".

2. More clarification is necessary in the specific case of having a bundle of two spare parts

How should the availability of spare parts be evaluated in the case of having a bundle of spare parts? For example, in the counter-assessment of the Y21s, the USB port is welded on the motherboard. Should all points be awarded for both spare parts if this bundle is available? It is important to remember that a common USB port is usually priced at 15 Euro, whereas the motherboard of the Y21s costs around 230 Euro. In addition, the repairability index values the access to individual spare parts. Therefore, in our counter-assessment we did consider that the USB ports were available. However, we think a clarification could prevent misinterpretations.

3. Oblige producers to make the availability period and the specific conditions on how to access spare parts easily accessible (including on their own website) to the consumer to gain points for criterion 3

During our interviews we learned that although certain spare parts are supposed to be available, some repairers struggle to find them. Indeed, no information about how to access spare parts is demanded in the repairability index. We believe that consumers may face the same problem.

In addition, as we explained previously in this part 4 on transparency, the score on the availability of parts is not meaningful to the consumer, who cannot deduce on his own which part is available and for how long. According to the French Consumer Code (Article L111-4), producers have to inform the professional vendor whether spare parts are available and for how long. However, we did not find availability periods on the producers' website we assessed. In order to properly inform the consumer, it is essential that this information is systematically made available wherever the index is mentioned by the producer, and that it is clearly displayed in the shop by the seller.

→ Therefore, **we demand that producers which get points thanks to the availability of their spare parts have to specify the spare parts concerned and their period of availability, as well as access, order and delivery modalities,** on a document made accessible via the index.

Criterion 4. *Spare parts price*

1. A clarification is needed concerning the non-availability of a spare part :

The instructions manual states that: *"In the event that, at the time the index is calculated, a part from list 2 is not available, the number of points awarded for criterion 4 relating to the price of spare parts is 0."*. Thereby, the Ministry has established the logic of penalizing the unavailability of spare parts (criterion 3) additionally in criterion 4 (spare parts prices).

However, given that the repairability index assesses the availability of spare parts for four different stakeholders (producers, distributors, repairers, and consumers), we are not sure if the former statement refers to a global unavailability (including all stakeholders) or also acknowledges the unavailability of spare parts for certain stakeholder groups.

For example, during our counter-assessments we learned that Apple does not commercialise any spare parts. No one, other than authorized repair centres have access to spare part stocks. Does that mean that criterion 4 should be calculated with the internal prices within Apple's repair network, or should we rather consider that parts of list 2 are not available for "outsiders" and hence award 0 points for the price of spare parts?

If the Ministry decides that producers should not be awarded 0 points, we believe that the exclusion of "outsider" stakeholders such as independent repairers and consumers should be stronger penalized in the repairability index. We believe that the access to spare parts and their prices are two closely related criteria. Therefore, we propose to discuss the possibility of applying in criterion 4 (spare part prices) the same logic as in criterion 3 (spare part availability), using 4 columns corresponding to the producer, distributors, repairers, and consumers. This would better account for the importance of spare part availability and their price, and be in coherence with the already established logic of penalizing the unavailability of spare parts (criterion 3) in criterion 4 (spare parts price).

2. How to anticipate price reductions?

The index does not account for price dynamics. In general, prices for EEEs decline over time much more than prices of spare parts. This would negatively impact the score of criterion 4 if it was recalculated over time. Consequently, in reality, consumers might be confronted with a much worse price ratio than displayed in the repairability index. We believe that this could be better anticipated.

Currently, criterion 4 is calculated using the price of spare parts which represents *the highest share of the turnover of the manufacturer […].* This price is likely not to be the highest price, for example, when mass discounts are given.

→ **We propose to use the most penalising price of spare parts for the calculation of criterion 4. Consequently, the scores of criterion 4 will most likely be lower than they are currently. Given the highly-likely price decline of EEEs over time, we think that such lower scores would be better representative of the reality consumers face.**

In addition, this would address the case where a manufacturer delivers its parts to its after-sales service at a reasonable price and at a price that is discouraging to other parties, thus contributing to blocking repair outside its own channels.

Criterion 5. *Product-specific*

→ **The importance of the specific criterion should be reduced.**

There is already an emerging consensus that this criterion has too much weight, because there is a very limited number of sub-parameters (between 1 and 3), giving them a disproportionate impact on the total score. In the case of the corded lawn-mower, for example, criterion 5 has only one sub-parameter, remote assistance, which therefore counts for 2 out of 10 points of the total score.

In addition, more sub-criteria could be added. For example:

Laptops

For smartphones producers are already standardising chargers. We believe laptop chargers should also be standardized and compatible with devices from other brands.

→ **For laptops we propose an additional sub-criterion for criterion 5: presence/ absence of a universal charger (compatible with devices from other brands).**

TVs

Sub-criterion 5.3.A does not consider different cases:

- A TV which allows the software of the electronic card to be reset without having access to the menu / screen (just by plugging in a USB key for example)
- A TV which does not allow this. This would mean that the electronic card must be changed, which is much more expensive.

→ **We propose to distinguish between these two cases by assessing the "possibility to reset the electronic without access to the screen"**

Sub-criteria related to software issues lack ambition

For smartphones and laptops, sub-criteria 5.1. (information about type of updates) lacks ambition. This is of large concern, as it accounts for 1 point out of 10 in the final score. In fact, this sub-criterion does not discriminate between products, since the points are almost systematically awarded[43]. Currently, manufacturers earn points for providing information about the nature of the updates (corrective, upgrades or mixed). It is based on the assumption that updates are offered separately depending on their nature. Yet, in reality, this is very rarely the case. In practice, updates are provided as packages and consumers usually do not have the opportunity to refuse a strictly separated upgrade update. So in fact, this parameter misses its objective.

To be more ambitious on the software issue, HOP recommends that:

- **Sub-criterion 5.1 (information about type of updates) should not be limited to the presence of information, but should also assess the possibility of refusing updates.**
- **Sub-criterion 5.1 (information about type of updates) should also assess whether the producer provides security-only updates separately from evolutive ones.**
- **Information provided in relation to sub-criterion 5.1. (information about type of updates) should be comprehensible for consumers. Indeed, the legibility of information provided varies strongly among producers. The information must be understandable by a user that is no expert in informatics.**
- **In addition, the duration of availability of the updates must be assessed (on a different line for each) with scores ranging from 5 to 10 years of availability.**
- **Moreover, manufacturers who use spare parts' pairing and serialization to block repair outside their authorised repair channels must be sanctioned via a specific sub-criterion.**

This phenomenon of spare part serialization has been well documented[44] and is of concern from a right to repair perspective.

NB: Concerning smartphones, we hope that these proposals will be echoed at European level where a repair score is being developed.

Clarifications needed from public authorities

Remote assistance :

- A question emerged during our counter-assessment concerning this sub-criterion. To get maximum points, the manufacturer must offer remote support for repair (hotline, visio, remote control, etc). In fact, many already offer this kind of service for software issues, but very few for hardware failure. So, what kind of breakdowns are included in "remote support for repair"?
  - assistance for software failures OR technical failures?
  - assistance for software failures AND technical failures?
- Concerning the up-to-date information on the website, what is the difference between this parameter 5.2A in column B (repairers) and the document 1.1.N (failures detection and required action) asked for in criterion 1?

Clarify the expectations about the sub-criterion "type of reset software" 5.3 :

43 UFC Que Choisir - INDICE DE RÉPARABILITÉ Une indispensable réforme pour le crédibiliser

44 https://repair.eu/news/part-pairing-a-major-threat-to-independent-repair/

- The notion of what the firmware reset should allow, in addition to the software reset in particular, is not clear to several stakeholders we interviewed about different product categories (ex: TVs, smartphones, washing machines). A precise definition would be welcome to prevent various interpretations of this parameter.
- It is indicated for software and firmware resets "including reset with outside buttons". This terminology is too vague. During our counter-assessment we did not know if the reset must necessarily be done using the external buttons (power and volume buttons) to get the points. This seems to be the most ambitious interpretation, and if so, it should be specified more clearly than with the word «including».

Conclusion

We have highlighted certain concerns about the **index's transparency.** To address these, we proposed:

- A public website to collect and display the repairability index;
- To make the completed and detailed calculation grid (excel file) publicly available by the manufacturer.

We identified a need to **review the weighting system** of the repairability index to avoid the compensation effect between criteria we described. HOP presented four propositions for a revised weighting system, highlighting the importance of specific (sub-)criteria.

In addition, we specified the need for **further clarification** from the Ministry of Ecological transition with regards to each criterion to assure a coherent interpretation of the calculation grid among producers. Lasty, we point out that some obstacles to repair and available facilitators of repair are not accounted for in the index. The table below summarises the latter points.

Table 2. Summary of needed clarifications and suggestions

Criterion 1. Documentation	• 1.1. D. Electronic board diagrams (clarification needed + increase weight); • 1.1.H. Component and diagnosis information (clarification needed); • Ease of access documents is neglected in the index (new sub-criterion proposed); • Absence of information on access to independent repairers (oblige producers) • A need to embrace innovative formats such as video tutorials in the index; • Documents 1.1.L - 1.1.O have a lower impact on the score (increase weight); • Overall weight criterion 1 should be decreased. • Clarify which repairer are referred to in column A (specify that independent repairers are included)
Criterion 2. Ease of disassembly	• Methodology for counting disassembly steps needs multiple clarifications; • "Permanent fasteners" need clarification, specifying that they are non-removable & non-reusable; • Overall impact of criterion 2 should be increased. **Smartphones** • Terminology of certain spare parts need clarification; • Pertinence of charger in list 2 is questioned. **Laptops** • Pertinence to assess the disassembly of the charger is questioned

Criterion 3. Spare part availability	• Scoring system of column B needs clarification (how to interpret the term "distributors"); • Scoring system of column C (whistleblowing about producers' assessment practices); • A typo in the instruction manual relevant for the scoring in column C has been pointed out; • Scoring in case of having a bundle of two spare parts needs clarification; • Information about the conditions on how to access spare parts is missing; • Overall impact of criterion 3 should be increased .
Criterion 4. Spare part price	• Ambiguous wording: non availability of a spare part and its consequence for the calculation of criterion 4 needs clarification; • Anticipate price reductions of EEEs is pertinent (adjustment of formula proposed); • Overall impact of criterion 4 should be increased.
Criterion 5. Product-specific	• Overall weight of criterion 5 should be reduced; • Weight of sub-criterion 5.1 should be reduced; • More ambitious parameters are proposed for sub-criterion 5.1.; • Remote assistance needs clarification, specifying software failures and technical failures; • Sub-criterion 5.3.A needs clarification. **Smartphones; washing machines** • Terminology of certain spare parts need clarification; **Laptops** • Standardized chargers are proposed as new sub-criterion **TV** • More ambitious parameters are posed for sub-criterion 5.3.A; • Sub-criterion 5.1. needs clarification

Conclusion

A crucial tool to foster repair, which can be improved.

One year after its entry into force and in the context of its extension to further devices, **HOP decided to take stock and create a comprehensive review of the repairability index**. To understand if the index can live up to its high hopes for more sustainable consumption patterns and the design of repairable products, we examined its current deployment in France, what it tells us about the reparability of the products concerned, people's understanding of the index, and its effect on consumption behaviour. To do this, we interviewed 27 diverse stakeholders from the repair sector and conducted an online survey with a large consumer panel with 1206 respondents. In addition, to address concerns about its self-declarative nature and decrypt the calculation grid in detail, we challenged six repair scores published by manufacturers with our own calculations.

In sum, **HOP is convinced that the reparability index is an important and valuable instrument in the fight against the throw away consumption culture** and for the essential mobilisation of the various stakeholders (consumers, repairers, distributors and manufacturers) to reduce environmental degradation.

To date, over 2000 repairability scores are already on the market, sensitising consumers about the reparability of new products. Differences of the ease to repair between different product groups are made visible by the index. For instance, the increasing difficulties to repair laptops are well captured by the index, as laptops have the lowest average score among the five product categories.

Manufacturers and distributors have mobilized important resources to enable the creation of the repairability index. Their work is bearing fruits. According to our survey, the majority of people (55%) are familiar with the index. In the light of its rather recent enactment, their understanding of the repairability index and its criteria is notable and customer service agents with whom we interacted seemed well-aware of the new repair scores.

These scores have already had some effects on consumer behaviour. We found that three-quarters of consumers in contact with the index during their purchase of a new device in 2021 find it to be helpful for making their purchase decision. These decisions are likely to become more sustainable, as products with a better repairability score are more likely to be purchased, which was an outcome of our online experiment on smartphones. Overall, 56% would recommend their friends to rely on the repairability index, showing consumers trust in this new instrument. Beyond an impact on consumer patterns, **we have also observed evolving practices of some producers**, for instance, by making more repair documents available.

Nevertheless, **we believe that some improvements are needed to avoid certain loopholes and to allow the index to reach its full potential.**

Indeed, our overview showing the current deployment of the index suggests large differences between the five product categories. We have found (by far) the largest number of indices for smartphones, with a wide range of scores. On the other hand, consumers of laptops will often be left disappointed when searching for a repairability index. Although we cannot quantify the percentage of products that are still without an index, it seems **a stricter application of the repairability index display is necessary to enable more consumers to identify the most repairable products. This is additionnally being hampered due to a lack of discrimination between the scores** in other product categories, such as washing machines and lawn mowers.

When we dug deeper into consumers´knowledge of the index, we learned that there is still some confusion about the index´ characteristics. For us, it seems that prior studies have overestimated how familare people are with the index. Likewise, there are large differences between producers when it comes to their knowledge of the repairability index. Whereas large brands who participated in the development of the index are savvy stakeholders, smaller actors are less aware of the index and present large knowledge gaps. In some cases, such as for large distributors accumulating the scores from a multitude of producers, this can impede a more rapid deployment of the index. Overall, these findings indicate that **more sensitization and education of consumers and marketers is still necessary** to increase the impact of the index. So far, most people (45%) have been made aware of the index via the TV. HOP urges to do more media campagnes using clear mandatory messages such as “to extend the life of the products, refer to the repairability index», and mention the repairability index in advertisements.

The high consumer confidence in the index implies a big responsibility for manufacturers to calculate a reliable index. Hence, we examined whether the scores could be controlled and reproduced by an independent third party, and wanted to answer the question: **are the scores reliable?**

First of all, we have highlighted certain concerns about the **index´s transparency**. To address these, **we suggest creating a public website to collect and display the repairability index; and to make openly available the completed and detailed calculation grid as well as the commitments on which producers base their calculations (in particular the periods of availability of their parts and their terms of access)**. We believe that this will facilitate the “control by the market” which is wanted by the French government, but in reality hardly feasible. In addition, these measures would enable consumers to access the index of a product that is no longer sold at the time of failure and hold producers accountable for their declared commitments; and even assist the government by informing about the index´s evolution and score distribution for future adjustments, such as scoring thresholds. **The submission of the repairability index and its completed and detailed calculation grid should be made mandatory for producers.** Otherwise, we fear that one individual actor with limited resources might become overwhelmed with the collection of published scores, which is what has occured to Spareka.

The results of our study show that except for one product, we systematically found lower scores than their manufacturers. The differences we obtained amount to 1.3 to 1.5 points out of 10 for three of the six products examined. For several assessed products, the availability of documents and spare parts seems to be overrated by producers compared to the possibilities found by HOP to access them. This exercise also revealed **the need for more clarification of certain points in the calculation grid.** Differences in the interpretation of certain parameters might explain, at least partially, some score variations. Such ambiguous points have been identified across all criteria, for example, we found important differences of interpretation on the availability of spare parts (criterion 3). We urge the Ministry of Ecological Transition to clarify the points highlighted in this report to ensure a uniform interpretation by all actors and guarantee a fair competition.

This report also aimed to examine whether the index accurately reflects the reparability of products. We believe that the index represents undeniable progress in assessing the repairability of our products and takes the main barriers to repair into account. But the current scores are too generous. In particular, it appears necessary to review the weighting system of the index to give priority to the disassembly, the availability and price of spare parts. Although in reality very poor scores in one of these criteria would make repair impractical, such a product can currently still reach a good overall score (e.g., 7/10, implying a green repair logo), as poor scores in one criterion are compensated by other criteria. This compensation effect was observed for multiple devices that we have counter-assessed. For example, for both Apple devices and the Samsung smartphone we observed good (above 6/10) and even very good (8/10) overall scores. However, the disassembly of all three devices was seriously hindered by welded or glued spare parts, making some failures non-repairable. Likewise, we consider Vivo Y21s` overall good score of 7/10 controversial, as Vivo does not commercialise any spare parts, and thereby blocks the repair of independent professional repairers and consumers themselves. Similar concerns can be raised for the Philips TV scoring an overall good 7 out of 10. Although we could not verify the prices for each spare part, Philips low score of 7/20 in criterion 4 (spare part price) seems to suggest that the price could impede the repair of certain spare parts in reality for consumers. HOP presents four alternative scoring systems, highlighting their advantages.

Also, we identified differences in the degree of ambition across the five criteria. HOP calls into question the relevance of specific sub-criteria (such as the assessment of the disassembly of a charger) and proposes more ambitious sub-criteria. These are based on additional obstacles or available facilitators of repair that are not yet accounted for in the index. For example, we advocate for the inclusion of additional software issues such as the serialization and pairing of spare parts in criterion 5.

The methodology applied in **this report has its limitations.** Due to limited resources, HOP assessed only 6 products. Besides, to deal with a lack of information in our counter-assessment, we made certain assumptions, which, although well-founded, could have to some degree biased our results and explain some of the variances found. This information was unavailable due to a lack of transparency of some brands regarding their practices assessed in the index, and because some of these parameters may be considered confidential (the price in particular). Moreover, HOP was not able to interview some stakeholders, which may have had complementary comments.

We would like to reiterate that HOP remains fully convinced that the repairability index is a key instrument for the ecological transition. This is underpinned by its positive effect on consumer behaviour and producer practices highlighted in this report. However, in terms of overall research approach, it is important to mention that we focused the majority of our attention on points which can be improved in the repairability index. Therefore, we acknowledge that more positive aspects of the repairability index might come too short in this report.

We are confident that the suggestions made in this report can increase the repairability index´ overall impact and are well-aligned with both of its objectives: to create better consumer information and increase competition among manufacturers around eco-design. In fact, we believe that they are especially relevant for forthcoming discussions around its transformation into a durability index and for ongoing reflections on the European repair score. Finally, by specifying problematic parameters, we believe that our remarks can also contribute to the preparation of official controls carried out by the DGCCRF.

Synthesis of HOP´s recommendations

Make the calculation of the index more reliable by providing clarifications for the following points:

C1. Documentation:

- Clarify Electronic board diagrams and Component and diagnosis information definitions
- Clarify which type of repairers are referred to in column A

C2. Ease of disassembly:

- Make some clarifications to the methodology to ensure a uniform counting of the disassembly steps between the different actors
- Provide videos of disassembly of a product of each product category, indicating how to count the steps of disassembly
- Clarify the term "permanent fasteners", specifying that they are non-removable and non-reusable
- Clarify the terminology of certain spare parts for smartphones

C3. Spare parts availability:

- Specify the availability assessment rule in the case of bundled parts
- Clarify the scoring system of column B (how to interpret the term "distributors")

C4. Spare parts availability:

- Clarify the cases where a part is considered unavailable for the calculation of criterion 4

C5. Product-specific criterion:

- Clarify the requirements for awarding points concerning remote assistance
- Clarify the expectations about the sub-criterion "type of reset software"

Increase the impact of the index

A. Make the index more ambitious

C1. Documentation:

- Include "ease of access to documents", without the need to reveal personal information, as another sub-criterion in criterion 1
- Encourage the repair of components by increasing the weighting factor of electronic board diagrams weighting
- Make the reference to repairer directories listed by Ademe mandatory to get points for parameter 1.1.
- Include "video tutorials for the disassembly of specific spare parts" in the assessed parameters
- Double the weighting factor of 1.1. L - 1.1.O to ensure that all documents have an equal impact

C2. Ease of disassembly:

- The pertinence of the charger in list 2 for smartphones and laptops and its disassembly assessment should be reviewed

C3. Spare parts availability:

- Award points in column B only when spare parts are available indiscriminately and unconditionally for all retailers

- Specify that points are awarded in column B for retailers located in France
- Award points in column C only when parts are provided directly and available to all repairers (including independent repairers)

C4. Spare parts availability:

- Use the most penalizing price of spare parts for the calculation of criterion 4

C5. Product-specific criterion:

- Sub-criterion 5.1 (information about type of updates) should not be limited to the presence of information, but should also assess the possibility of refusing updates
- Sub-criterion 5.1 (information about type of updates) should also assess whether the producer provides security-only updates separately from evolutive ones.
- The duration of availability of the updates must be assessed (on a different line for each) with scores ranging from 5 to 10 years of availability in an additional sub-criterion.
- Moreover, manufacturers who use spare parts' pairing and serialization to block repair outside their authorised repair channels must be sanctioned via a specific sub-criterion.
- For laptops we propose an additional sub-criterion: presence/absence of a universal charger

B. Make the index more discriminating between product models

- Review the weighting system in order to avoid important compensation effects
- Reduce the weight of the specific criterion (C5) or increase its ambition (cf. recommendations on software issues)

C. Improve control and monitoring

- Start to carry out official controls as soon as possible to ensure that the index is always displayed and that scores are reliable
- Facilitate control by the market, by obliging producers to make the completed and detailed calculation grid accessible (not only the summary of the calculation)

D. Extend the scope of the index

- Continue to extend the index to new products including printers
- Clearly indicate in the co-construction working groups that the index scale should go beyond the description of current practices, and encourage innovative eco-design
- During the elaboration process systematically arbitrate in favor of the most ambitious choice. If a different choice has been made on the same criterion in the past for another product, harmonization must be done from the present to the past

E. Empower consumers and sensitize all stakeholders

- Make it compulsory to indicate the index in advertisements for concerned products
- Create a public website collecting all the repairability indexes, facilitating the comparison of products
- Communicate on the repairability index and support assistance and trainings
- Oblige producers to make the availability period and the specific conditions on how to access spare parts easily accessible to the consumer to gain points for criterion 3
- Oblige producers to make the availability period and the specific conditions on how to access documentation easily accessible to the consumer to gain points for criterion 1
- Information provided in relation to sub-criterion 5.1. (information about type of updates) should be comprehensible for consumers. Indeed, the legibility of information provided varies strongly among producers. The information must be understandable by a user that is no expert in informatics.

Appendix

A. Methodology to measure the effect on consumer behaviour (part 2)

- We focused on the influence of the three key factors (index score, price and brand) in likelihood to purchase a product.
- We combined these in a 3-dimensional matrix of two options for each factor, to get a set of 8 possible product combinations (see table below).
- Due to methodological limitations, we used purchase intention as a proxy
- We focused on one product category: smartphones
- We sent one survey, and incorporated an A/B test mechanism so that each participant is shown two sets of two product options. They then were asked to indicate the likelihood of a purchase (on a 5 point likert scale) of each of the 2 product options in each of the 2 questions.
- The combination options were split between A/B as shown in the table below. This is designed so that the more obvious choices are not offered to one group (e.g. same brand and repairability 'scores' with one option low price and one high price).
- For the analysis, this meant we have likelihood scores for each choice. Each choice would have two 'paired' options for comparative analysis of the different factors. E.g. High price-favourite brand-medium repairability could be compared with High price-not favourite brand-medium repairability to explore brand; and High price-favourite brand-high repairability to explore repairability.
- In our analysis we always compared two options, which are equal except for one factor.
- For example: Comparing options 1 and 3 allowed us to estimate the effect of a medium vs. high repairability index, given a high price and the favourite brand. Since options 1 and 3 are equal except for the repairability index, any difference would be explained by the effect of medium vs. high repairability.
- One important assumption was that the participant pools rating options 1 and 3 are sufficiently similar and don't have any structural differences (e.g. in terms of age, gender, environmental awareness). Given our large sample size, this was not an issue.

Option	Price (High/Medium)	Brand (Favourite/Not favourite)	Repairability index (High/Medium)	A/B test
1	H	F	M	A-Q1
2	M	F	M	B-Q1
3	H	F	H	B-Q1
4	M	F	H	A-Q1
5	H	NF	M	B-Q2
6	M	NF	M	A-Q2
7	H	NF	H	A-Q2
8	M	NF	H	B-Q2

B - Results for measuring the effect on consumer behaviour

Scenario	Medium repairability score	High repairability score	Difference
High price, favourite brand	HFM (1) A-Q1 2,06	HFH (3) B-Q1 2,69	H +0,63
Medium price, favourite brand	MFM (2) B-Q1 2,76	MFH (4) A-Q1 3,19	H +0,43
High price, not favourite brand	HNFM (5) B-Q2 1,94	HNFH (7) A-Q2 2,43	H +0,49
Medium price, not favourite brand	MNFM (6) A-Q2 2,48	MNFH (8) B-Q2 3,28	H +0,80

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