

# Environmental Data Program: Repair Index Methodology How to assess repairability?

White Paper

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## Executive summary

Regulatory organizations aim to protect customers from repair limitations, planned obsolescence, and excessive maintenance costs. As demand for maintenance, refurbishment, and remanufacturing grows, high repairability contributes to efficiently extend products lifespan. Consequently, the repair index is gaining traction, and it will be essential to harmonize criteria and rating scales across different regions and product categories.

Schneider Electric has developed its own consistent scale, based on existing assessments programs, to assess the repairability of its products and help customers make comparisons within product categories.

This repairability assessment is based on five key criteria, including access to documentation, availability of spare parts, disassembly ease, repair price, and customer support. Although the repairability assessment is voluntary within Schneider Electric's portfolio, it aligns with the European Commission's broader sustainable and circular economy goals and marks a pivotal step towards material efficiency assessments. The final score, presented in a format inspired by European Commission Energy Labelling, provides a concise evaluation of product repairability.

# Introduction

## Product

*means any physical good that is placed on the market or put into service* (ESPR 2024/1781 Art. 2.1)

From Schneider Electric's perspective, providing a high level of service involving corrective, preventive, and increasingly predictive maintenance is the best way to minimize downtime for the users' installations.

Despite all the efforts to make repairs easier for customers, some applications and products<sup>i</sup> must be repaired by specifically trained personnel to ensure the safety of the product's functions.

Schneider Electric intends to propose a common scale for assessing repairability of products. Creating a consensus on repairability assessment is important to help customers to compare products within the same category.

In November 2024, Schneider Electric launched its Environmental Data Program, shifting from a labelling approach to a detailed transparent, data-based framework in order to champion transparency and actively support clear environmentally conscious choices. This Environmental Data Program measures, categorizes, and displays the environmental attributes and footprint of our products. Different categories of environmental data are made available, covering the full product life cycle. The repair index of our products is included in the Lifetime Extension category of this program.

## Which product types are eligible for the repair index?

Currently, the repairability assessment is a voluntary approach in Schneider Electric portfolio. The Ecodesign Methodology deployed in Schneider Electric screens for many ways to "Use better, Use longer and Use again" each product ([BLA Approach](#)). The repairability assessment is an additional step towards a broader, more complete, and systematic approach to supporting ecodesign. This customer-centric journey will lead to a global improvement of the communication on relevant criteria, focusing on the most material impacts for performance improvement.

The repair index from Schneider Electric can be applied to the entire portfolio and demonstrates effectiveness at anticipating European and local regulations. It also serves as a pioneering force in expanding towards a more holistic and standardized lifecycle resource efficiency evaluation of products, complementing existing literature.

Beyond meeting mandatory requirements, Schneider Electric is committed to fostering a corporate culture that prioritizes repairability and to enhancing customer awareness about its importance.

## Local initiatives

Since its introduction in 2020, the French Anti Waste (AGEC<sup>ii</sup>) law has pioneered a repairability index aimed at protecting customer rights. Its provisions seek to raise consumer awareness regarding the potential for product repairs while simultaneously encouraging manufacturers to simplify the repair process. Currently, the compulsory French reparability index only applies to the business-to-consumer (B2C) sector and specifically targets household appliances such as televisions, smartphones, washing machines, etc.

As the world's first mandatory repairability index, this French initiative plays a crucial role in driving the sustainable transformation of the B2C market by fostering independent and DIY repair practices. By keeping valuable materials within closed loops in France, the index aims to mitigate the challenges associated with material scarcity. Following France's lead, Belgium has also developed its own repairability index.

To streamline efforts and prevent the establishment of disparate repairability scoring systems across European nations, the European Commission is proactively addressing this issue. The Commission has reinforced its ecodesign requirements, integrating criteria for repairability and durability within the Energy Labelling Regulation<sup>iii</sup>, thereby superseding local regulations<sup>iv</sup>.

## Regulations and Standards Context

## EU Ecodesign legislation evolution

The European Commission aims to encourage manufacturers to retain the highest possible value in their products for as long as possible, therefore leading to zero waste and aligning with its broader sustainability goals.

While the Energy Efficiency<sup>v</sup> Directive and Ecodesign Directive<sup>vi</sup> laid the foundations for improving energy performance, the Ecodesign for Sustainable Products Regulation (ESPR) builds on these by extending the scope to include material efficiency. Inspired by the proven success of the previous directive<sup>vii</sup> - as acknowledged by the European Commission - the ESPR represents a strategic move towards more comprehensive sustainability objectives.

The Ecodesign for Sustainable Product Regulation<sup>viii</sup> EU 2024/1781 (ESPR) is part of the latest evolution of the 30-year-long journey of European framework on the Ecodesign. ESPR aims to create an overarching legislative framework in the EU, focusing on the integration of environmental sustainability into both product characteristics and processes across the entire value chain. Its objectives to introduce rules applying to all products on the internal market, with the goal of making them more durable, reusable, repairable, upgradable and recyclable. As such, this regulation sets eco-design rules for electrical related products, addressing all material efficiency and circular economy aspects, including reparability assessment. ESPR 2024/1781 repeals the Ecodesign Directive 2009/125/EC, which only covered energy-related products. To ensure full harmonization, ESPR will apply to all goods placed on the market within the European Union, regardless of where they were produced. Thus, the next generation of eco-design legislation at EU level is introducing requirements for products to respond to increased objectives for sustainable design to enter the European market.

ESPR and Energy Labelling Working Plan 2025-30<sup>ix</sup> and Ecodesign requirements for smartphones Regulation<sup>x</sup> EU 2023/1670 are detailing the future requirements on design for repair. These include the availability of spare parts, access to repair and maintenance information, the maximum delivery time of spare parts, information on the price of the spare parts, disassembly requirements and requirements for preparation for reuse. For the other electrical related products, ESPR requirements will be decided through secondary legislation. and it is hoped that the Schneider Electric work on the reparability index will inform the future horizontal requirements for reparability to be set over the next years for our industry and product categories.

## Standardization to comply with regulations

Standards are a convenient way to define the pieces of evidence required to comply with regulation. The European Commission can harmonize standards to align standard compliance and regulatory compliance. With regards to, the EN 45554 standards provides general methods for the assessment of the ability to repair, reuse and upgrade energy-related products. Schneider Electric repair index is based on this standard as well as on industrial maintenance standards that have been used to adapt the repair index to the maintenance needs for the safety of B2B products.

# Repair Index Methodology

## Scope of the assessment

The repair index can be calculated for a product range representing a group of commercial references. This requires a functional product that can either be standalone or assembled from multiple commercial references in modular or configurable ranges.

## Repairability Assessment Criteria

As defined in this document, high product repairability is considered as financially and logistically advantageous for the customer, when compared to the purchase of a new product. The five criteria used to assess repairability are based on the most effective factors that make Schneider Electric products easier to repair.

The weight of each criterion has been defined to consider the design for repair. In addition, the quality of the documentation, along with the availability and price of spare parts are key enablers in facilitating the repair of any product.

The following criteria are given equal weight in the assessment (Figure 1).

### Documentation: accessible at different levels of use

The documentation, properties, and services associated with a product, are key elements for the feasibility and safety of repairs. When a failure occurs, the customer needs safe and clear information to start the repair process. Information is only considered available if Schneider Electric gives the stakeholders access to it.

Information about the repair process can be made available in physical records or through digital documentation. The repairability assessment considers the amount of information provided, its relevance and accuracy. For safety reasons, some repair instructions may only be accessible for authorized and trained repairers. This criterion is one of the most important in the scoring process.

### Spare parts: available and easily supplied for repairs

Lifetime extension is focused on upgrading and updating core components of assets in order to bring back the system to the current state of the art, adding digital features and providing condition-based maintenance to reduce the potential risks of failure. Additionally, ease of repair significantly contributes to prolonging a product's lifespan. The parts needed to maintain the product are included into the wear parts or functional parts list. For this assessment, wear parts, maintenance parts, and spare parts are all considered as spare parts.

Regardless of the cost of the repair or the ease of disassembly, the availability of spare parts a critical factor in enabling manufacturers to facilitate repairability for customers. Moreover, an extended availability of spare parts enables a faster and easier repair process. As the availability period for spare parts has a direct impact on the extension of a product's lifetime, backwards compatibility can be a valuable strategy to further increase the products' lifespan.

In summary, longer availability of spare parts not only simplifies repairs but also plays a key role in maximizing product lifespan.

### Disassembly: facilitated by the design of the product

During the repair process, it is often necessary to disassemble the product to reach the defective part. Design for repair considers the steps needed to disassemble and reassemble a product. The more accessible the part, the easier it is to repair the product. This approach also favors the use of a limited number of common tools, making the repair process more efficient and user-friendly.

## Price: lower than buying a new product

The cost of repair services the customers would have to pay will influence their decision to repair a product. The price of repair depends on various factors, including the expertise and time required for the repairs, the cost of sending the product back to the repair facility and resend to customers, the cost of the spare parts, and the cost of the specific tools required for the repair.

## Support: available to customers

Customers expect support to return, diagnose and repair products. The support criterion reinforces reparability by enabling an efficient repair process while minimizing the need for physical intervention or on-site support. The criterion prioritizes a support service that enables quicker problem identification, provides the experts with accurate guidance, and leads to faster resolutions of failures.

Finally, the skills, resources, and service options needed to carry out the repair operations account for the remaining 25% of the final score. The other 75% are linked to design choices to enable the repairs.

## Final Score

The display of the Schneider Electric repair index (A, B, C, D) is inspired from the European Commission Energy Labelling<sup>xi</sup> implemented to raise customer awareness about the global evaluation of product reparability.

The scale only consists of four levels to assess the design for repair actions and to promote best-in-class products. The green A level is only accessible if the product is effectively eco-designed. Highest score is not accessible for products which have not been designed for repair.

### Modular ranges

*Means all subassembly available as a commercial reference to provide a modular functional product*


Modularity is an efficient way to achieve reparability. Product repair index is calculated on a functional product. However, for some highly modular ranges, several commercial references are assembled into a functional product. In this case the reparability index reflects the reparability of the combination of commercial references. For modular ranges (e.g. Harmony, Modicon, ...), the reparability index is calculated based on the typical configuration of a product.

CALCULATION OF THE REPARABILITY INDEX Presentation of the criteria on which the assessment is based		Product Example			
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Criterion	Sub-criteria	Grade of the sub criteria /10	Weighting of the subcriteria	Grade of the criteria /20	Total /100
CRITERION 1 : DOCUMENTATION	1.1 Type and availability of information	7,5	2	14,9	70,2
CRITERION 2 : PRICE	2.1 Price of spare parts - Weakest parts (list 2)	0	1	8,5	
	2.2 Working environment - Functional and Weakest Parts (List 1 & 2)	7,0	0,5		
	2.3 Skill level necessary for repair - Weakest parts (list 2)	10,0	0,5		
CRITERION 3 : DISASSEMBLY	3.1 Disassembly depth - Weakest parts (list 2)	10,0	1,5	19,8	
	3.2 Tools necessary for repair - Weakest parts (list 2)	9,0	0,25		
	3.3 Type of fasteners and connectors - Weakest & Functional parts (list 1 & 2)	10,0	0,25		
CRITERION 4 : SPARE PARTS	4.1 Availability and duration of availability of spare parts - Weakest & Functional parts (list 1 & 2)	10,0	1	12,5	
	4.2 Delivery time of spare parts - Weakest & Functional parts (list 1 & 2)	2,5	1		
CRITERION 5 : SUPPORT	5.1 Return option	6,7	0,5	14,6	
	5.2 Diagnostic support and interfaces	7,5	0,75		
	5.3 Free Remote Assistance	7,5	0,75		

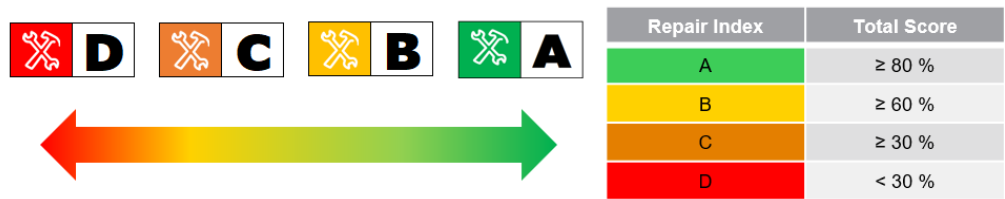
**Figure 1**

*Example of Repair Index assessment tool Score Card*

Final Scoring available on se.com: 

**Figure 2**

*Grades result of the assessment*



## Conclusion

Schneider Electric aims to provide a high level of service through corrective, preventive, condition based and predictive maintenance to minimize downtime for user installations. In this context, the proposal for a common scale to assess product repairability is important in enabling customers to compare products within a category. The objective of this index is to incentivize design for repair. The repairability assessment is based on five categories of criteria, focusing on factors such as documentation, spare parts availability, disassembly, price, and support. The final score, based on a European Commission Energy Labeling-inspired scale, aims to provide customers with an overview of a product's repairability.

Although the repairability assessment is voluntary within Schneider Electric's portfolio, it aligns with the broader sustainable and circular economy goals set by the European Commission.

Overall, the repairability assessment reflects Schneider Electric's commitment to sustainability, customer-centricity, and material efficiency in product design and maintenance.

## Terms and Definitions

### Glossary

<b>AGEC</b>	Anti-Gaspillage Economie Circulaire (Anti Waste Law)
<b>B2B</b>	Business to Business
<b>B2C</b>	Business to Consumer
<b>CE</b>	European Conformity (Conformité Européenne)
<b>DIY</b>	Do It Yourself
<b>EC</b>	European Commission
<b>ESPR</b>	Ecodesign for Sustainable Product Regulation
<b>TV</b>	Television

## About the authors



**Amandine LOUISE** is Ecodesign Conformity Assessment Manager in Innovation and Technology Certification Team lead by Sven SALENBACHER, Energy Management. Her mission is to prepare the product certification for the environmental regulations' tsunami. She aims to create processes to anticipate, influence, and ensure compliance with the new Ecodesign for Sustainable Products Regulation (ESPR), the Right-to-Repair, and all upcoming regulations introducing new environmental requirements to access to the market, maintain the CE marking during all the life of the product (repair, refurbish, upgrade). Finally, she has been accompanying Sustainability Energy Management Teams in third-party certification as recycled and/or bio-based plastics since August 2023.

She has been an ELECTRIFIER Level 1 Expert since 2022, having created the Repair index for Industrial Goods as well as standardization Expert on Material Efficiency assessment with Martial Patra for: CLC/TC 22X/WG 09 - Material Efficiency for Circular Economy.

She joined Schneider Electric in 2016 in the Global Customer Projects entity as a Functional Safety Expert, after various experiences in industrial companies. In 2010, she was Functional Safety Engineer in Lithium-Ion Battery, Hydrogen fuel cells, high-pressure vessels, medical devices, nuclear power plants, or transportation command and control. She started as a Quality, Safety, and Environmental engineer for the Landfill sector, building construction, and natural gas compression for transportation.

She has an Engineering master's degree in industrial risk management delivered by INSA CVL (former ENSI de Bourges).



**Pauline MOURLON** is the leader of environmental standardization for Schneider Electric's Industrial Automation business. Member of Patrick LAMBOLEY's team, she covers the topic of sustainability. She monitors the standardization activities in France, Europe and internationally, ensuring the synchronization with other standards activities from the other regions in the world.

She is the main contributor to the internal standard "Repairability Index Guideline", leads the Repairability community and supports projects on the use of the repairability assessment tool.

Pauline's primary goal is to represent Schneider Electric's initiatives within standardization groups, on design and technical methodologies. Leveraging insights from R&D activities and design processes, she ensures that Schneider Electric's sustainability efforts align with standard development, regulations, and those of industry peers. Additionally, she is tasked with coordinating Schneider Electric's design activities, external positioning and strategy, and regulatory compliance specifically focused on sustainability. Pauline is involved in several technical working groups within the standardization landscape, more specifically in ecodesign and material efficiency dedicated groups:

- Expert member of CEN-CENELEC /JTC 10/WG8: "Circular Design" in Material efficiency aspects for products in scope of Ecodesign legislation
- Expert member of IEC/WG 20: "Guidance on material circularity considerations in environmentally conscious design"

With a degree in Urban Planning and Environment and with a focus on energy sizing in buildings, she is responsible for finding consensus on environmental definitions between industrial processes and standardization bodies.

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[EEMODS 2024 : Industrialization of the French Repair Index – Overview of the regulations, analysis of the B2C constraints and conclusion](https://easychair.org/publications/preprint/VTbJ)  
<https://easychair.org/publications/preprint/VTbJ>



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## End Notes

<sup>i</sup> ESPR Art 2.1 Product Definition: [https://eur-lex.europa.eu/eli/reg/2024/1781/oj/eng#art\\_2](https://eur-lex.europa.eu/eli/reg/2024/1781/oj/eng#art_2)

<sup>ii</sup> Anti Waste Law : Loi Anti-Gaspillage et Economie Circulaire :

<https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759/>

<sup>iii</sup> Energy Labelling Regulation 2023/1669 for Smartphones: [https://eur-](https://eur-lex.europa.eu/eli/reg_del/2023/1669/oj/eng)

[lex.europa.eu/eli/reg\\_del/2023/1669/oj/eng](https://eur-lex.europa.eu/eli/reg_del/2023/1669/oj/eng)

<sup>iv</sup> Avis Circonstancié de la Commission Européenne : [https://www.inc-](https://www.inc-conso.fr/sites/default/files/pdf/20231027-avis-circonstancie-comm-europeenne.pdf)

[conso.fr/sites/default/files/pdf/20231027-avis-circonstancie-comm-europeenne.pdf](https://www.inc-conso.fr/sites/default/files/pdf/20231027-avis-circonstancie-comm-europeenne.pdf)

<sup>v</sup> Energy Efficiency Directive (EU/2023/1791) [https://energy.ec.europa.eu/topics/energy-](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en)

[efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive\\_en](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en)

<sup>vi</sup> Framework for the setting of Ecodesign requirements for energy-related product Directive

(2009/125/EC) <https://eur-lex.europa.eu/eli/dir/2009/125/oj/eng>

<sup>vii</sup> COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC (§Annex 6: The current Ecodesign framework p 158) [https://eur-](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022SC0082)

[lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022SC0082](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022SC0082)

<sup>viii</sup> Ecodesign for Sustainable Product Regulation (ESPR) (2024/1781) [https://eur-](https://eur-lex.europa.eu/eli/reg/2024/1781/oj/eng)

[lex.europa.eu/eli/reg/2024/1781/oj/eng](https://eur-lex.europa.eu/eli/reg/2024/1781/oj/eng)

<sup>ix</sup> ESPR and Energy Labelling Working Plan 2025-30 [https://eur-lex.europa.eu/legal-](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52025DC0187&qid=1744814743855)

[content/EN/TXT/?uri=CELEX%3A52025DC0187&qid=1744814743855](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52025DC0187&qid=1744814743855)

<sup>x</sup> Ecodesign requirements for smartphones, mobile phones other than smartphones, cordless phones and slate tablets Regulation 2023/1670 [https://eur-lex.europa.eu/legal-](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1670)

[content/EN/TXT/?uri=CELEX%3A32023R1670](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1670)

<sup>xi</sup> [https://energy-efficient-products.ec.europa.eu/ecodesign-and-energy-label/understanding-](https://energy-efficient-products.ec.europa.eu/ecodesign-and-energy-label/understanding-energy-label_en)

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