ecosystem
recycler c'est protéger

Summary of Ecodesign and Prevention Plans developed by ecosystem producer members

Professional Electrical and Electronic Equipment sector

5 December 2023

Version 1.0

Dashboard of indicators and key messages

Key indicator	Category	Result
Number of **ecosystem** producer members by type of producer in the Professional sector	Manufacturer	668
	Non-manufacturer	1252
	Total Professional	1920
Number of individual plans received by type of **ecosystem** producer members in the Professional sector	Manufacturer	201
	Non-manufacturer	242
	Total Professional	443
% of individual plans received in relation to the number of producer members in the Professional sector	Total Professional	23%
% of individual plans received in relation to the tonnage of equipment put on the market in the Professional sector	Total Professional	37%
Number of joint plans received from the Professional sector	Total Professional	0

Mandatory areas of the AGEC anti-waste law	Main trends[1] in waste prevention and ecodesign from plans received from ecosystem producer members - PRO
Reduction in the use of non-renewable materials	Identification and evaluation of product constituent materials
	Reduction in non-renewable materials, especially virgin plastic
	Ecodesign/LCA approach to product development
	Optimisation of product characteristics: weight, dimensions, volume
	Rationalisation and standardisation of materials and components used
	Use of recycled materials (plastics) and reuse of components[2]
	Development and promotion of modular, more sustainable products
	Working with suppliers: awareness, evaluation, incentives
	Substitution with renewable materials (natural or biosourced)
	Reduction and optimisation of packaging
Increased use of recycled materials	Integration of recycled plastics and target for increasing content
	Product development favouring the incorporation of recycled materials
	Identification of materials and analysis of the integration of recycled materials
	Evaluation/Selection of suppliers by incorporation rate
	Partnerships with suppliers of recycled materials (e.g. recyclers)
	Sustainable purchasing strategy based on ecodesign criteria
	Evaluation, traceability and certification of recycled materials used
	Repair of defective products to extend their useful life[2]
	Improved awareness among stakeholders: employees and suppliers
	Use of biosourced materials (products)/recycled paper (packaging)
Improved product recyclability	Product analysis and recyclability assessment for improvement
	Working with suppliers: awareness, evaluation, incentives
	Choice of recyclable materials and single-material components
	Promotion and eco-selection of recyclable products
	Consideration of component separability and modularity in design
	Compliance with REACH and RoHS regulatory requirements
	Reduction and elimination of substances (BFRs, halogens, etc.)
	Reduction in the number and diversity of materials and components (standard.)
	Training, awareness of recyclability/dismantling (internal, external)
	Improved repairability in development [2]

Strong action to promote the circularity of EEEs
To be handled with caution with a view to EEE circularity or to be completed
Action outside the scope of treatment in the EEE sector

[1] It should be noted that certain major trends were reflected in different mandatory areas (e.g. working with suppliers)

[2] Although this is an interesting way of extending equipment life, the trend is not associated with a reduction in non-renewable materials nor the increased use of recycled materials.

Contents

EEE - Electrical and Electronic Equipment: equipment operating "by means of electric currents or electromagnetic fields, and equipment for the generation, transfer and measurement of such currents and fields, designed for use at a voltage not exceeding 1,000 volts for alternating current and 1,500 volts for direct current (Legifrance, Article R543-172 - Code de l'environnement, 2022)

Household vs. Professional: Professional equipment is by its very nature intended exclusively for professional use. All other electrical equipment is considered as Household (ecosystem, 2023)

Manufacturer: producer responsible for the manufacture and/or assembly of the product(s) marketed (**ecosystem** definition)

Non-manufacturer: a producer who is not considered a manufacturer under the definition above and who may be an introducer (outside the EU), importer (EU), remote seller or own-brand vendor (**ecosystem** definition)

PPE - Plan de Prévention et d'Ecoconception (prevention and ecodesign plan): a plan drawn up by the producer and revised every five years, with the aim of reducing the use of non-renewable resources, increasing the use of recycled materials and increasing the recyclability of its products in processing facilities located in France (Legifrance, Article L541-10-12 - Code de l'environnement, 2020)

WEEE - Waste Electrical and Electronic Equipment: the term applies to electrical and electronic equipment, and the waste arising from it, including all components, sub-assemblies and consumables that are an integral part of the product at the time of disposal (ecosystem, 2023)

1. Introduction

Article L 541-10-12 of the AGEC anti-waste law enacted in February 2020 states that: "*Each producer is required to draw up and implement a prevention and ecodesign plan with the aim of reducing the use of non-renewable resources, increasing the use of recycled materials, and increasing the recyclability of its products in processing facilities located in France*."

For the EPR WEEE (Waste Electrical and Electronic Equipment) sector, this obligation applies in particular to producers of Professional equipment (manufacturers, introducers, importer-resellers, own-brand sellers, distance sellers), whether they are part of an individual system or a member of an eco-organization.

They must produce a plan defining the prevention and ecodesign objectives and actions to be implemented over the next five years. This plan can be drawn up individually or collectively by producers and must be revised every five years, incorporating a review of the previous plan.

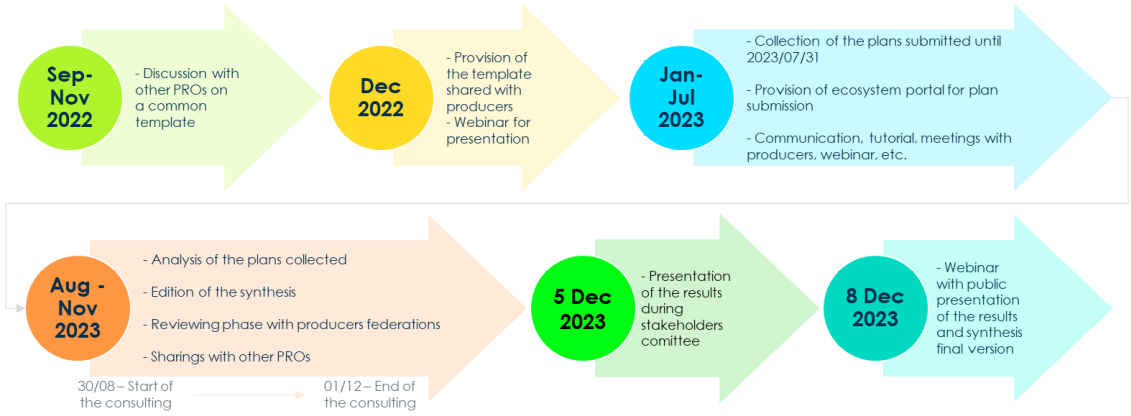
For producers in a mutual system, individual or collective plans must be sent to the Producer Responsibility Organisation to which they belong. Every three years, **ecosystem** must draw up a summary of the prevention and ecodesign plans of its producer members, for publication accessible to the general public.

This summary is presented below and expresses the commitment of **ecosystem** member producers in the Professional EEE sector to waste prevention and ecodesign.

Professional electrical and electronic equipment is complex and heterogeneous, requiring higher levels of performance in the face of significant technical constraints, with a strong focus on durability. This equipment is subject to strict standards and regulations depending on the criticality of the environment in which it is used (medical, safety, etc.). Equipment reliability is crucial to avoid costly downtime, which means that maintenance and support operations must be carried out regularly and with advanced technical support.

2. Methodology

It took more than a year to produce this summary, which is shown in the timeline below:



The deadline set by **ecosystem** for the submission of plans was 31st July 2023. However, this summary includes all plans submitted to **ecosystem** up to 31st August 2023.

During the analysis phase, the main difficulty encountered was the extensive heterogeneity in the formats of plans received (Excel vs PDF, French vs. English, **ecosystem** vs other, added/deleted rows/cells, etc.), as well as their content (modification of areas, sub-areas, freedom of content authoring).

Of all the plans received (in terms of tonnage of equipment placed on the market) 92% were considered in the analysis for the purposes of this summary. Particular care was taken to ensure that all types of producers were represented (manufacturers vs. non-manufacturers, high dispersal of sales and units brought to market, low and high maturity in ecodesign and circular economy).

As the number of plans received for this sector was significant, the main trends (if possible the 10 most recurrent) by area and sub-area representing the objectives and actions proposed by the producers were identified. **ecosystem** then assessed these trends according to three levels presented in chapter 5, with justification of its analysis.

The levers for action in terms of waste prevention and ecodesign may differ according to the type of producer. It is therefore relevant to distinguish between trends taken from plans received from manufacturers and those taken from plans received from non-manufacturers. Any producer in the introducer, importer-reseller, own-brand vendor or remote seller category is considered here as a non-manufacturer and the results presented in this summary are therefore differentiated from producers from the manufacturer category.

3. ecosystem support

To help its producer members implement and build this prevention and ecodesign plan, **ecosystem** has made available a number of resources.

Template for response to regulatory requirements

A spreadsheet template (in French and English) to help producers draw up a five-year action plan was proposed to members, with the aim of guiding them through the required steps and useful questions to ask. This file is available for download on the **ecosystem** website at the following address:

https://pro.**ecosystem**.eco/service/eco-conception/plan-prevention-ecoconception

Co-developed with the Producer Responsibility Organisations CITEO, Ecomaison and Refashion, the proposed template uses the design areas specified by the applicable article of the Law, namely increasing the integration of recycled materials, reducing the use of non-renewable materials and improving recyclability. The template also offers the possibility of going further in all stages of a product life cycle, for example, by potentially extending its lifespan. For each of the areas covered by the regulations and supplementary to them, **ecosystem** has proposed sub-areas where producers have been able to implement one or more related actions. This template is structured as follows:

- **Mandatory areas required by the law:**

Area	**Sub-area**
Reduce the use of non-renewable materials	Identify and reduce non-renewable materials
	Rationalise the quantities of materials and components used
Increase the use of recycled materials	Maximise the use of recycled materials
	Identify suppliers, create partnerships
Improve product recyclability	Choose recyclable materials
	Ensure parts are separable
	Restrict/reduce the presence of recycling disruptors and hazardous substances
	Rationalise the diversity of materials and components

- **Supplementary areas not referred to in the law:**

Area	Sub-area
Product design to extend their useful life	Develop upgradeable products, suited to updates and upgrades/reconditioning/remanufacturing
	Standardise materials, parts and components
	Design for multiple uses and users/facilitate a second life
	Maximise robustness and reliability
	Ensure repairability (disassembly, information and spare parts)
	Prioritise timeless aesthetics and styles
Services and support to extend product useful life	Raise user awareness of proper product maintenance
	Develop/propose product updates/update services (aesthetic, software, functional, etc.)
	Offer repair services (user services, spare parts, etc.)
	Promote/provide services for reuse, recycling and reconditioning
	Promote the sale of uses rather than products and the sharing economy
Product design to limit the impacts of use	Limit consumption (energy, water, consumables, etc.) during use
	Reduce emissions and discharges during the product life cycle
	Facilitate eco-friendly actions (energy consumption, waste management, good product maintenance) by users
	Ensure ease of maintenance
Optimise product packaging	*Obtain information from the dedicated EPR sector*
Manufacturing and distribution processes, traceability	Reduce consumption and emissions associated with manufacturing processes
	Minimise waste and production volumes
	Limit distribution phases, consumption and waste
	Promote the use of renewable energies
	Optimise product weight/volume ratio
	Develop supply chain traceability and control.

In addition and with a view to implementing the actions described above, this template suggests that producers consider:

Organisation	Ecodesign strategy decision-making process
	Human resources
	Creation of a project team or expert
	In-house knowledge of ecodesign
	Ecodesign support
	Budget
Training	Employee training
Tools	Environmental assessment tools
	Decision-making tools
	Diagnostic tools
	Other tools

For information, 62% of the plans received by **ecosystem** used the template described above. A plan is considered to have used the **ecosystem** template format when the spreadsheet has not been modified in any way, either in terms of form (added/deleted tabs/rows/columns, merged cells, etc.) or content (names of areas/sub-areas/fields to be completed). Nonetheless, in practice, over 85% of producers who submitted a plan used the template provided by **ecosystem**, with a small proportion adapting the format to their own needs.

Other **ecosystem** support

For all sectors and in addition to the template, **ecosystem** has provided its members with other media to help them understand the regulations and adopt the template:

Media	**Language (French or English)**	**Consultation (31 August 2023)**
Video tutorial	FR EN	795 views 182 views
Public webinar	FR	151 live participants 1,500 replays
Trade association webinars	FR	AFIMIN - 8 participants CIFL - 7 participants INOHA - 30 participants
Web page	FR EN	7,644 times 203 times
Mail and telephone hotline	FR & EN	419 responses from the **ecosystem** ecodesign team (80% of requests received by the ecodesign team) 102 responses from Producer Relations teams
Workshops, technical meetings	FR & EN	22 support services delivered by the ecodesign team

Between December 2022 and July 2023, a number of email and verbal communications were made to collect as many plans as possible. These proved to be effective as shown by the influx of plans received as a result of these communications.

4. Review of plans

The aim of this paragraph is to provide quantity-related and quality-related feedback on the prevention and ecodesign plans submitted.

Quantity-related feedback on plans received

The main quantity-related indicators are shown in the table below:

Key indicator	Category	Result
Number of **ecosystem** producer members by type of producer in the Professional sector	Manufacturer	668
	Non-manufacturer	1252
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% of individual plans received in relation to the number of **ecosystem** producer members in the Professional sector	Total Professional	23%
% of individual plans received in relation to the tonnage of equipment put on the market by **ecosystem** producer members in the Professional sector	Total Professional	37%
Number of joint plans received from the Professional sector	Total Professional	0

For information, between 1st September 2023 and 15th November 2023, **ecosystem** received 30 additional plans for the Professional sector that were not included in the compilation of this summary.

ecosystem did not want to provide its members with a collective plan to which they could have subscribed, to offer them as much freedom as possible in developing their own content, and to avoid influencing possible actions they have developed in favour of waste prevention and ecodesign. **ecosystem** wishes to enable its producer members to report faithfully on their actions and to make proposals by focusing on the specific features of their equipment, which are very varied in the EEE sector.

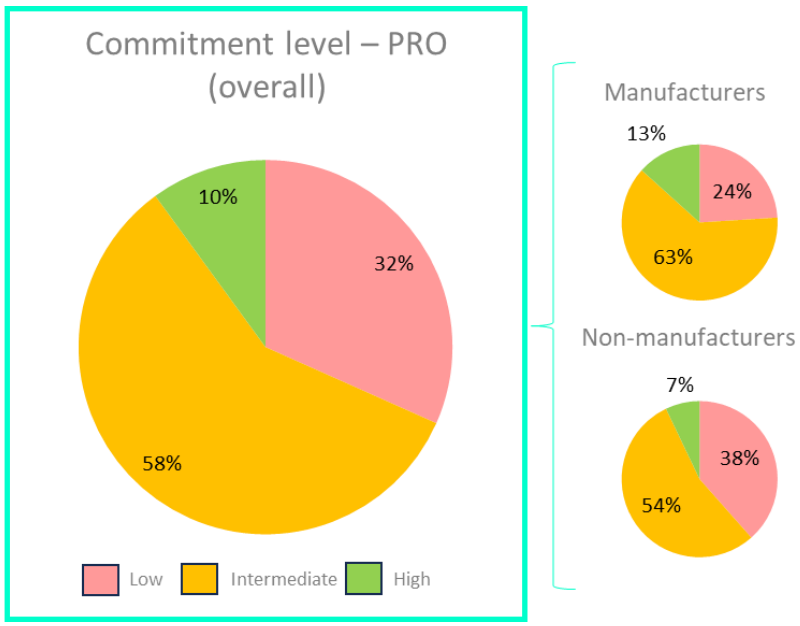
The results presented here and in the following sections reflect the commitment of producers who have adopted a position on the subject, with an encouraging participation rate.

Quality-related feedback on plans received

ecosystem wanted to assess the overall level of engagement in the plans submitted, using three categories:

- Low: The producer is not or is only marginally positioned in the three areas addressed by the regulations (see Introduction) or has not indicated any action in line with the **ecosystem** scope in the areas addressed (e.g. action in terms of packaging and not involving the product). For example, a plan where just one action is described in all mandatory areas could be considered low-level.
- Intermediate: The producer has positioned itself on the three areas addressed by the regulations, in line with the **ecosystem** scope applicable to the areas addressed. It has also positioned itself in other supplementary areas. However, the plan lacks detailed or quantified information on the objectives or milestones associated with the actions described.
- High: The producer has positioned itself on the three areas addressed by the regulations in line with the **ecosystem** scope, as well as on additional areas, providing precise and quantified details of the associated objectives or milestones.

This assessment was applied to all the plans received from the Professional sector, but also based on the distinction between manufacturer and non-manufacturer producers. The following indicators have been developed according to the ratio of the number of plans reviewed with a low/intermediate/high level of engagement to the total number of plans reviewed, overall and then by type.



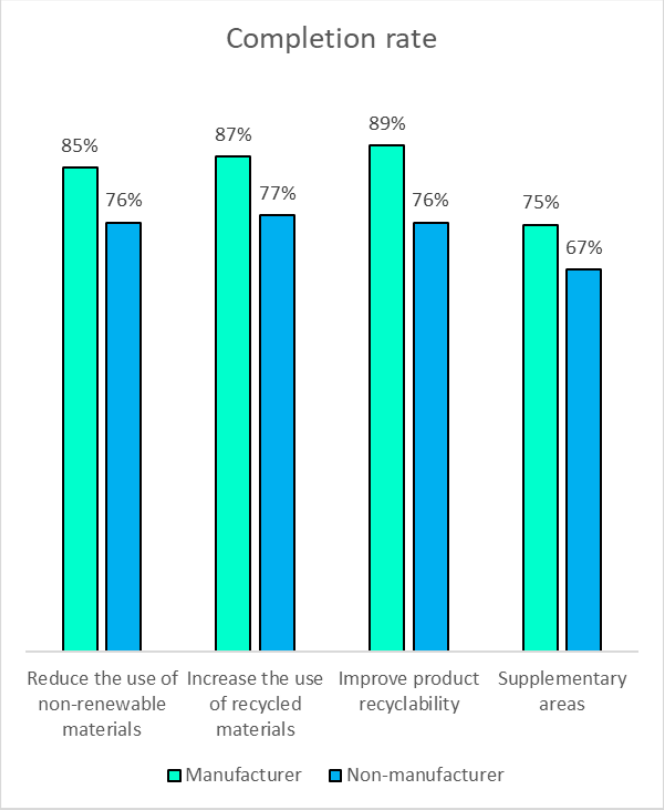
Most of the plans received are at intermediate level, which indicates that all **ecosystem** producers in the Professional sector are well on the way to meeting the three regulatory targets.

Furthermore, most of them have also positioned themselves in supplementary areas, which testifies to the willingness of producers to deploy further actions to extend the useful lifetime of equipment and reduce their environmental impact throughout the product life cycle.

As this is the first time all producers have used this format, the results are very encouraging. Despite the lower proportion of plans with a high level of engagement, making these plans part of an improvement process will help to increase this rate. **ecosystem** is available to support producers in this process.

With regard to the differences between the two categories of producer, it has been observed that non-manufacturers have levers that are more difficult to activate, as they involve working mainly with the upstream value chain. This helps to explain why there are fewer globally high-level engagement plans compared to manufacturer producers.

An analysis of the engagement rate for each of the areas covered by the regulations and for the additional areas proposed by **ecosystem** through the template is also presented to supplement the previous results. The results of the graph below represent the rates of plans for which at least one relevant action in each area has been indicated, for the two categories of producers.



NB: A producer who has committed to one action for one area is counted the same as a producer who has committed to several actions for the same area.

Like non-manufacturers, manufacturer producers are almost as engaged in the areas targeted by the regulations as they are in supplementary areas.

For each area, producers were able to use one or more of the sub-areas proposed in the template to define their actions and engagements. The results presented below detail the completion rate for each sub-area of the **ecosystem** template for each area.

Example of the "Increase the use of recycled materials" area:

Two sub-areas are presented in the template:

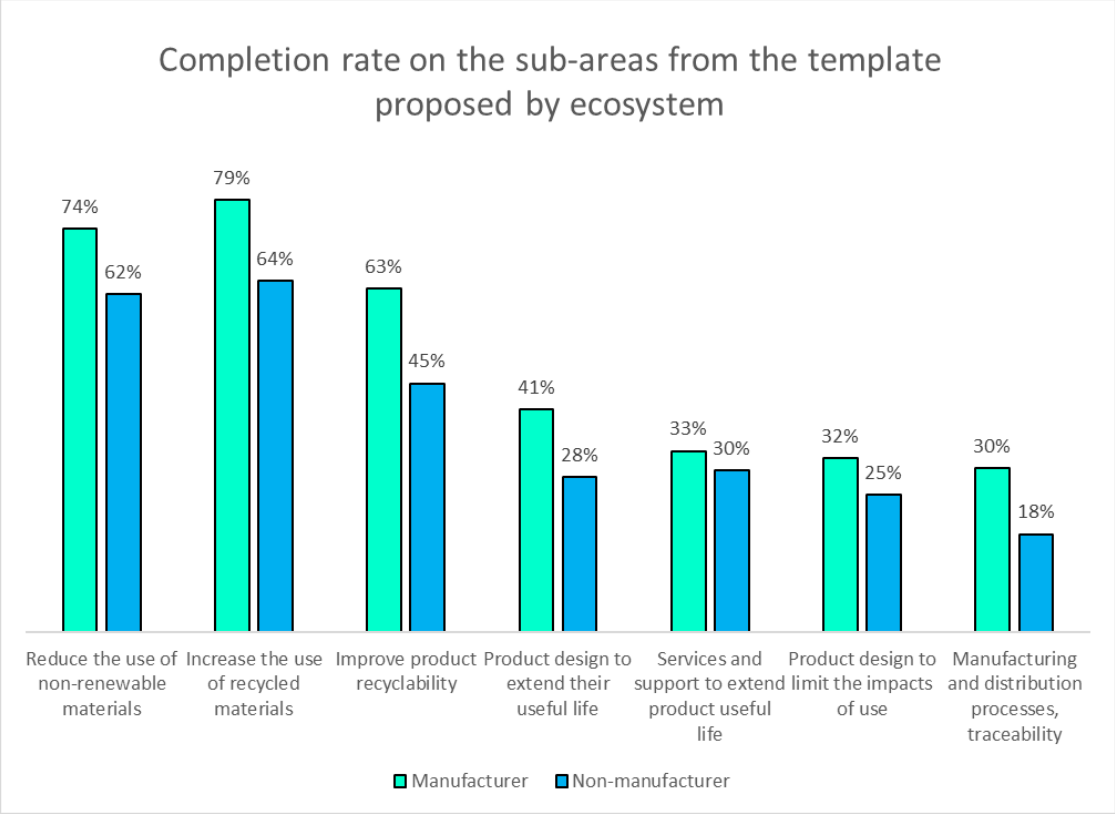
- *Sub-area 1: Maximise the use of recycled materials*
- *Sub-area 2: Identify suppliers, create partnerships*

If a producer has only committed to sub-area 1, its engagement rate for the "increase the use of recycled materials" area is 50%.

The final rates were therefore calculated as follows:

$$\frac{\text{Total number of sub-areas informed in all plans received and analysed}}{\text{Number of sub-areas in the template x Number of plans received and analysed}}$$

A minimum commitment threshold is defined: this corresponds to the rate achieved by entering a sub-area for each area. The minimum commitment threshold (plotted in red on the graph) differs from area to area. In fact, if an area is characterised by two sub-areas, the minimum commitment threshold is reached at 50%. If an area is characterised by five sub-areas, the minimum commitment threshold is reached at 20%, as is the case for the "Services and support to extend product useful life" area.



Overall, most of the producers indicated actions relating to the sub-areas of the three areas addressed by the regulations. Engagement rates are very satisfactory (minimum threshold exceeded). Producers, both manufacturers and non-manufacturers, have made greater commitments to "Reduce the use of non-renewable materials" and "Increase the use of recycled materials" than to "Increase product recyclability".

Secondly, it was found that producer-manufacturers have a higher level of commitment than non-manufacturers in the sub-areas of the supplementary areas, and above or equal to the minimum threshold for each of them.

To conclude this part of analysis related to the level of engagement in the plans, **ecosystem** notes a strong willingness among producers to commit to a strategy of waste prevention and ecodesign. It should not be forgotten that this is the first time that all producers, irrespective of their sales figures, the quantity of units placed on the market or the type of appliance, are concerned by such an obligation. For some producers, particularly non-manufacturers, it represents an initial opportunity to get to grips with ecodesign issues. This makes the resulting level of engagement in the plans even more appreciable. Some producers have even taken advantage of this opportunity to go beyond the regulatory constraints and scope their work, identifying the resources and tools needed to deploy the action plan and thus go further.

Finally, it should be noted that this assessment is the sole responsibility of **ecosystem** and does not confirm or reject the compliance of producer plans. Its aim is simply to assess the level of

maturity of **ecosystem** producers with regard to these issues, in order to develop appropriate support programmes and offer the right level of support.

When examining the plans, it was noted that **ecosystem** has difficulty in reaching the right level of corporate contact responsible for completing the plans. In this sector, design offices responsible for ecodesign issues are often based abroad and it is not always easy for them to adapt these requirements to the French market. Some producers, especially self-employed entrepreneurs, very small businesses and SMEs, do not always have the human and financial resources to propose an ambitious plan. Furthermore, non-manufacturer producers needed specific support to understand the regulations and see how they could respond to them, not without difficulty. These factors can therefore potentially reduce the level of engagement in plans submitted to **ecosystem**.

Moreover, the plans received were extremely heterogeneous. Producers have engaged in various actions, often in quantity-related terms. However, it is difficult to compare these quantitative targets for the same action, as the units of quantity used are very often disparate. As an illustration, with regard to Area 2 which aims to increase the amount of recycled materials, producers have committed to several points in their plans:

- a specific range of products
- all product ranges
- X% integration of recycled materials in the whole product
- Y% integration of recycled materials in the plastic content
- Y'% integration of recycled materials in a specific plastic content
- Z% integration of recycled materials in the metal content
- χ suppliers surveyed
- ψ% of suppliers surveyed

It therefore proved impossible to consolidate average quantities for the actions proposed. **ecosystem** therefore decided to use a few relevant examples to illustrate the trends emerging from the plans, rather than calculate doubtful averages that would not accurately reflect producer engagement in this area.

5. Prevention and ecodesign initiatives for the sector

The aim of this chapter is to present the main trends promoting waste prevention and ecodesign, as illustrated by producers in the prevention and ecodesign plans submitted to **ecosystem**. As these producers do not have the same means of action, a distinction has been made between manufacturer and non-manufacturer producers.

The analysis of major trends was conducted based on the elements of the **ecosystem** template in the following sequence:

- Compilation of all data entered in each plan analysed for each area and sub-area
- Clean-up of compilation file by deleting elements not relevant to the analysis ("NA", "not relevant", "/", etc.)
- Elimination of duplicates resulting in an identical plan for two producers belonging to the same entity
- Recurrence analysis of terms to prioritise trends for each area and sub-area.

Mandatory areas

For each of the mandatory areas, a maximum of ten major trends were identified per sub-area and prioritised according to their recurrence in the plans analysed. When fewer than ten trends are presented, this means that there was not enough overlap between actions indicated by producers to present more.

Each trend identified according to its recurrence in the plans analysed was evaluated according to the following three categories:

- Strong action to promote the circularity of EEEs
- To be handled with caution with a view to EEE circularity or to be completed
- Action outside the scope of treatment in the EEE sector

The following sections present the tables summarising the main trends per sub-area for each of the mandatory areas analysed by **ecosystem**. It should be noted that each area contains an "other action" sub-area, to leave producers free to propose other waste prevention and ecodesign actions themselves.

Reduction in the use of non-renewable materials

Major trends in waste prevention and ecodesign taken from plans submitted by ecosystem producer members
Identification and evaluation of product constituent materials
Reduction in non-renewable materials, especially virgin plastic
Ecodesign/LCA approach to product development
Optimisation of product characteristics: weight, dimensions, volume
Rationalisation and standardisation of materials and components used
Use of recycled materials (plastics) and reuse of components
Development and promotion of modular, more sustainable products
Working with suppliers: awareness, evaluation, incentives
Substitution with renewable materials (natural or biosourced)
Reduction and optimisation of packaging

Producers have committed to relevant actions with the overall aim of reducing the use of non-renewable materials.

Initially this took the form of product assessment and analysis of the materials of which they are made (plastics, but also metals, both common and critical), with a view to defining reduction objectives for their use. Particular attention was then paid to product design and development, with reference to an ecodesign approach and the use of life-cycle analysis to identify areas for improvement. In order for life cycle assessment to fully meet the objective of this area, scenarios must be studied to compare design options with renewable and non-renewable materials.. Optimisation of product technical characteristics, in particular their weight and dimensions, was often put forward, as well as integrating the concepts of modularity, standardisation and rationalisation of the materials and components used in the development and promotion of more durable products. Actions to raise awareness and train stakeholders, both internally and externally, were often indicated, with particular emphasis on collaboration and incentives for suppliers.

Innovation is also one of the relevant aspects of ecodesign. This was reflected in the promotion of 3D printing as a solution indicated on several occasions. In fact, this solution has the advantage of being flexible and adaptable to a wide range of applications, making it possible, for example, to validate a technical solution before producing a volume of potentially non-compliant parts, or to produce tailor-made spare parts on demand, thus reducing overproduction and storage.

One of the main difficulties in this area for the EEE sector is the alternative to non-renewable materials. This can be understood as the promotion of renewable materials, such as natural materials (e.g. wood or plant fibres in plastics), or biosourced materials (e.g. biosourced plastics). This type of action is included in many plans but should be treated with caution. As far as the end-of-life of EEE is concerned, the natural materials mentioned are not recyclable within the sector. It should be noted that very few biosourced plastics are currently used in EEE.

An alternative found by some was the use of more recycled materials and the reuse of components. This echoes the second mandatory area and indirectly leads to a reduction in the use of non-renewable materials. This trend is therefore outside the scope of this area, although it is interesting in terms of waste reduction and ecodesign.

Another recurring trend considered outside the scope of this report concerns packaging, which is not directly linked to waste prevention and ecodesign for the EEE sector.

Most of the actions undertaken by producers were shared by both manufacturers and non-manufacturers. In the case of the latter, greater emphasis is placed on raising supplier awareness and encouraging them to integrate this objective of reducing the use of non-renewable materials. Some non-manufacturers who contribute to product specifications have been able to make engagements in the same way as manufacturers, while for others, the

emphasis has been more on eco-selection and the promotion of products containing fewer non-renewable materials, with the aim of guiding customers towards a more sustainable choice. This distinction between non-manufacturers involved in product design and development with their suppliers and non-manufacturers sourcing products from catalogues could not be made by **ecosystem** to refine this analysis.

For future plan updates and with a view to continuous improvement, here are our recommendations and points for attention:

- To provide a better understanding of the notion of renewable and non-renewable materials, and to raise awareness of the specificity of natural materials from the viewpoint of EEE end-of-life recyclability
- Raising producer awareness to the out-of-scope nature of packaging in prevention and ecodesign plans for the EEE sector
- Encouraging producers to quantify targets for reducing the quantity of non-renewable materials, based on optimising product design (weight, size, volume) or improving the supply process.

Increased use of recycled materials

Major trends in waste prevention and ecodesign taken from plans submitted by ecosystem producer members
Integration of recycled plastics and target for increasing content
Product development favouring the incorporation of recycled materials
Identification of materials and analysis of the integration of recycled materials
Evaluation/Selection of suppliers by incorporation rate
Partnerships with suppliers of recycled materials (e.g. recyclers)
Sustainable purchasing strategy based on ecodesign criteria
Evaluation, traceability and certification of recycled materials used
Repair of defective products to extend their useful life
Improved awareness among stakeholders: employees and suppliers
Use of biosourced materials (products)/recycled paper (packaging)

Producers have committed to appropriate actions aimed at increasing the proportion of recycled materials in equipment placed on the market.

This has primarily resulted in the challenge of maximising the use of recycled materials, mainly plastics and metals (aluminium, steel), with sometimes quantified and very heterogeneous targets for minimum rates to be achieved on product ranges (e.g. increasing the content of recycled plastics from 0% to 50%). Product assessment and evaluation, with an emphasis on identifying recycled materials (used and potential for use) and traceability, are key issues for producers. Increasing the use of recycled materials in design was often mentioned. Product development was also mentioned in the context of ecodesign or eco-selection, the latter being closely related to the concept notion of supplier evaluation and selection.

Working closely with suppliers was also addressed through sustainable purchasing and sourcing strategies. Among suppliers, a distinction is made between those who offer recycled materials downstream in the chain (e.g. recyclers), leading to the creation of new partnerships, and those upstream in the chain who supply producers with components, parts and/or products for which new requirements are included in specifications on the incorporation of recycled materials.

Most of the actions undertaken by producers were shared by both manufacturers and non-manufacturers. However, even though some of the latter may be involved in product design (this distinction could not be made during the analysis), the emphasis is generally placed on

evaluating products and suppliers to steer a purchasing and sourcing policy towards products incorporating more recycled material. Among manufacturers, while this action was often included in the plans, there were considerably more actions concerning product design and industrial production with the integration of use of recycled materials.

The sector is not yet subject to the same regulatory requirements as the Household sector, notably concerning environmental labelling and the percentage of recycled materials incorporated into a product, as provided for in Article 13 of the AGEC Law. However, many producers have taken inspiration from this to include in their plans actions relating to the assessment and traceability of recycled content in products. This encouraging trend illustrates producer commitments to incorporate more recycled materials in their equipment. This objective is also associated with an eco-modulation criterion that allows producers to see their eco-contribution reduced via a bonus. The latter necessarily implies the use of post-consumer rather than pre-consumer recycled materials, such as regrind plastic from production.

Finally, other less relevant actions were identified. While product repair is relevant to the issue of extending useful life, it is not directly related to the use of recycled materials. Furthermore, actions on packaging and the use of biosourced materials are outside the scope, as explained for the first area.

For future plan updates and with a view to continuous improvement, here are our recommendations and points for attention:

- Understand the concepts of recycling and recycled vs. reused
- Raising producer awareness to the out-of-scope nature of packaging in prevention and ecodesign plans for the EEE sector
- Encourage producers to set realistic targets for incorporating recycled materials into their products. A feasibility assessment of the proportion of recycled material that can be incorporated into products is recommended before defining the target rates. **ecosystem** is available to support producers in integrating recycled materials from DEEE.

Improved product recyclability

Main trends in waste prevention and ecodesign in plans submitted
Product analysis and recyclability assessment for improvement
Working with suppliers: awareness, evaluation, incentives
Choice of recyclable materials and single-material components
Promotion and eco-selection of recyclable products
Consideration of component separability and modularity in design
Compliance with REACH and RoHS regulatory requirements
Reduction and elimination of substances (BFRs, halogens, etc.)
Reduction in the number and diversity of materials and components (standard.)
Training, awareness of recyclability/dismantling (internal, external)
Improved repairability in development [2]

Producers have committed to appropriate actions aimed at increasing the recyclability of equipment they design, develop, manufacture, purchase and place on the market. These actions are mainly based on:

- The choice of recyclable materials or products, with upstream actions to analyse and assess the recyclability of products for improvement
- The integration of separability concepts into specifications for R&D teams in charge of product design or for suppliers
- The rationalisation of the quantities and types of materials (e.g. limited variety of plastics) and components used, based on reinforced standards

- The reduction/elimination of recycling disruptors and substances. On this last point, reliance on REACH and RoHS regulations on substances was often mentioned. To improve equipment recyclability, compliance with these regulatory requirements should be supplemented by actions to reduce the presence of unregulated recycling disruptors such as brominated flame retardants and persistent organic pollutants.

Most of the actions undertaken by producers were shared by both manufacturers and non-manufacturers. Even if the distinction between non-manufacturers, namely those who have control over product characteristics and those who don't, could not be made during the analysis, actions very often involve suppliers upstream in the chain.

In terms of improving product recyclability, we note that producers are keen to identify and favour recyclable materials. Firstly, this involves analysing the composition of products, which for non-manufacturers means asking suppliers for this information.

Once again, this sector is not affected like the Household sector and the biggest marketers are, to the environmental labelling and recyclability requirements of Article 13 of the AGEC anti-waste law. And yet, through the plans we received, producers have demonstrated their willingness to assess the recyclability of their products, in a forward-looking and highly encouraging approach. In this sense, the quest for the highest possible recyclability rate on all products is a priority often found in the plans of both manufacturers and non-manufacturers, as the latter depend on an eco-selection process for products.

It is worthy of note that producers have integrated the challenges of reducing disruptive elements in recycling. This has mainly involved compliance with REACH and RoHS environmental requirements concerning nominated substances, but also a desire to reduce the number of substances of concern contained in products, particularly plastics containing Brominated Flame Retardants (BFRs). In terms of product design, the objectives of separability, with the extraction of electronic components and the reduction of irreversible bonds (e.g. adhesive bonding, soldering, crimping), were often mentioned. In addition, the choice of single-material products and the avoidance of duplicate moulding were also part of the objectives of several producers. Finally, in terms of products and improved recyclability, we find objectives to rationalise materials and components, and even products and product ranges, particularly for non-manufacturers.

Producers have often incorporated repairability in product design and development, in addition to the objectives of separability of parts and components. While this is relevant in terms of extending the useful life of equipment, it is less relevant in terms of recyclability. The challenge is to integrate actions that promote recyclability while remaining compatible with product repairability.

Finally, actions concerning the packaging scope were sometimes mentioned, with actions again considered less relevant by **ecosystem** for WEEE management, but which did not emerge as a majority trend.

For future plan updates and with a view to continuous improvement, here are our recommendations and points for attention:

- Understand the concept of recyclability vs. recycling/reuse/repairability
- Support producers in ecodesign to assess and improve product recyclability, define realistic, quantified targets
- Assist producers to identify technical solutions for the design of equipment with a view to recyclability
- Support producers in the construction of recyclability indicators for inclusion in specifications, both with manufacturers and with non-manufacturers, as part of an eco-selection approach

Supplementary areas

In addition to the three areas mentioned above and addressed by the Law, producers were invited to use the form provided to set out their objectives and commitments in **four supplementary areas** (in addition to packaging, which is specific to the EPR sector in question), with a view to extending the useful life of equipment, limiting the impact of use and "produce more wisely", with a section dedicated to the manufacturing, distribution and traceability phases.

Analysis of the plans shows that on the whole, producers have made a strong commitment to these issues and are determined to respond to them by taking action, in particular to ecodesign and develop products that incorporate their potential for repairability or reuse, and by offering associated services to ensure that they last longer. Although there is no regulatory obligation in terms of repairability, some producers are showing ambitions in this direction, drawing inspiration from the existing index for household products to integrate a systemic approach to product assessment.

For non-manufacturers, the actions undertaken in these supplementary areas have often led to eco-selection initiatives and the introduction of product eco-scores, for example, to guide end-users towards more sustainable choices.

The availability of spare parts, information and product documentation for maintenance and repair is also essential to ensure that equipment lasts as long as possible. Significant efforts have been made by producers to commit to this approach. Furthermore, the development of digital solutions was widely mentioned as a support to these challenges. Traceability is also one of the areas for improvement on which many producers have made a commitment, particularly with regard to their supply chain.

Finally, decarbonisation appears to be a priority issue that is already well understood by the majority of producers, who have also transcribed their objectives in this direction, notably in the use of renewable energies within the logistics sector by optimising and choosing modes of transport with less impact, and in the production sector by improving monitoring and quality control, the latter being more the concern of manufacturer producers.

For each of the supplementary areas, the analysis of major trends was based on the recurrence of engaging actions for each of the sub-areas proposed in the **ecosystem** template. A classification of each sub-area with a breakdown of the key measures identified is summarised in the tables presented in Appendix 2, again with a distinction between manufacturing and non-manufacturing producers.

Levers for action by manufacturers and non-manufacturers

An analysis of prevention and ecodesign plans shows that manufacturers and non-manufacturers do not have the same levers for action to prevent waste and to ecodesign the equipment they put on the market. These levers have been compiled for all sectors, areas and sub-areas in the table below. A relevant example for each lever from the plans is also presented.

MANUFACTURER		NON-MANUFACTURER	
LEVER	TEXT TAKEN FROM PLANS	LEVER	TEXT TAKEN FROM PLANS
Identify materials and their composition (nature, substances, etc.) for evaluation and improvement	*Calculate the percentage of recycled and recyclable material for each product*	**Gather information from suppliers**	*Encourage the use of devices manufactured in short circuits and request information from our suppliers on their circuits*
Product design (design, styling, assembly, etc.)	*Add a design review phase during the development of new products to improve disassembly and separation of parts*	**Collaborate with manufacturers on product design**	*Work closely with at least X key suppliers to increase the use of recycled materials in our products by Y% by 2028*
Work with material suppliers to promote the use of less non-renewable materials and to integrate more recycled and recyclable materials	*Increase the % of recycled materials used in our products and have 100% suppliers with up-to-date REACH & RoHS certification*	**Produce specifications for products using fewer non-renewable materials, more recycled materials and more recyclable products**	*Incorporate design analysis into new product specifications to reduce the amount of material used in mechanical and electronic components*

Pool and standardise materials and components	*Harmonise our product BOMs to use the same component on several products as much as possible*		
Optimise production (quantity of materials, etc.), reduce product size and volumes	*Reduce the total weight of the equipment and its recharging system by at least X%*	**Optimise purchasing, ordering and inventory management**	*Supply/store/sell standard spare parts common to several machines under a single reference (screws, bearings, switches, belts, carbon brushes, etc.): limit the number of product references stocked and reduce logistics flows*
Raise awareness of the circular economy, ratings for materials suppliers (sustainable purchasing)	*Make designers (internal) and suppliers (all) aware of the need to recycle our products using ecosystem tools*	**Raise awareness of the circular economy, ratings for manufacturer suppliers (sustainable purchasing)**	*Introduce an internal eco-responsible purchasing charter for our suppliers, distributors and customers*
-	-	**Create eco-selection systems and raise consumer/end customer awareness**	*Create an eco-score on the 2024 catalogue*
After-sales management	*Development of after-sales service to encourage equipment repairs*	**After-sales management, distribution platform and warehouse**	*Maintain after-sales service and spare parts availability for at least 10 years after product discontinuation*
Internal employee training and engagement	*Raise awareness among purchasing, quality and marketing staff and new recruits of the need to reduce the use of non-renewable resources*	**Employee training and engagement**	*Raise awareness among R&D and purchasing teams of non-renewable materials and their environmental impact*

Manufacturers and non-manufacturers may therefore have different levers for action on product ecodesign due to their role and position in the value chain. These two categories of producer nevertheless underline the importance of raising awareness about waste prevention and ecodesign issues in-house.

For their part, manufacturers have direct control over the production process. They can influence the selection of materials, manufacturing methods and technologies used. They can work directly with suppliers of materials and components, giving them greater capacity to integrate more sustainable materials and more environmentally-friendly manufacturing processes through better control of technical constraints. Thanks to their expertise in manufacturing processes, manufacturers may have a better understanding of the environmental implications of different production methods and are directly involved in product design, giving them the opportunity to integrate environmental considerations right from the start of the process.

Producers who are not directly involved in manufacturing may have less control over these aspects. Their influence can be limited to the definition of specifications and the management of subsequent phases in the product life cycle. These producers are often dependent on their suppliers, in a sometimes closed or niche market. Their ability to influence sustainability may be limited by the options available on the market and by manufacturer decisions. Non-manufacturers may also not have such in-depth knowledge of the technical details of a product and production, which may limit their ability to directly influence these aspects of circularity. Through their closeness, they sometimes have other levers to influence customers/end consumers to choose the most sustainable products, to maintain them better, to promote reuse and repair circuits, to manage logistics and after-sales platforms, and thus constitute an important link in the chain for more circularity.

recycler c'est protéger

6. Recommendations and conclusion

Feedback from **ecosystem**

In the electrical and electronic equipment sector, a number of requirements for ecodesign actions such as the European ecodesign directive, have already been in place for many years. Manufacturers have implemented a number of energy-efficiency measures (EuP and ErP) on an ongoing basis, to reduce the energy consumption of equipment during its use. More recently, French and European initiatives have focused on optimising material efficiency, which means working on the constituent materials of a product and the way they are arranged: recyclability, integration of recycled materials, re-usability, repairability, durability, etc. The new requirement for prevention and ecodesign plans, which complements other regulations, enables us to **summarise and structure our activities, focusing in particular on this material efficiency**.

In the course of supporting producers in the development of these plans, **ecosystem** has been confronted with **numerous questions about this new obligation**, particularly from small businesses with no resources dedicated to these subjects, and specifically for those with no expertise in product manufacturing. Implementing and identifying levers throughout the supply chain may have been a difficult task, given its scale and relatively tight time line. In particular, some importers and introducers who put very little equipment on the market and work with huge multinational structures, wonder about their power of influence and therefore the applicability of this obligation to their situation. At the same time, **ecosystem** has sensed concern on the part of producers about the vagueness associated with certain points of these regulations (performance obligation/best efforts obligation, checks, data confidentiality, etc.). **More clarity is needed on the future of these prevention and ecodesign plans**.

In the areas concerning the use of non-renewable resources, the use of recycled materials and recyclability, certain producers are **more or less familiar with these concepts in their technical aspects** (e.g. recycled vs. recovered vs. reused, recyclability vs. recycling, recycled vs. recyclable materials, definition of renewable character, etc.). **Greater awareness of semantics** is needed among all producers. The glossary in the appendix 7 includes terms that may have raised questions or led to confusion in the answers.

To support its producer members in the development of their plans, **ecosystem** has chosen to propose a template to structure their thinking and provide ongoing support. This is reflected in the figures and support tools provided to producers, as described in section (4) "Qualitative feedback on plans received".

This support, which has been much in demand by producers, has also served as a reminder of the challenges facing the sector and the constraints involved in recycling professional WEEE, which is complex equipment, de-polluted and processed in a diverse combination. Particular emphasis was placed on "Reduce the use of non-renewable materials" and the complexity of its implementation in the EEE sector. The term "renewability" is rarely used in the Professional EEE sector. For this sector, interpreting the first area as "increasing the share of renewable materials" is a risk: as renewable materials such as wood or plant fibres are not recyclable in the sector, this would degrade the recyclability of the equipment concerned. **ecosystem therefore warns that the uniformity of the obligations and priorities set out in the law could have negative rebound effects depending on the sector in question.**

Furthermore, the extensive analysis of plans carried out by **ecosystem** to develop this summary was particularly valuable, especially for the dedicated support to producers. Prior to meeting with a manufacturer, the **ecosystem** ecodesign team can consult the manufacturer's prevention and ecodesign plan, to assess its level of maturity on these issues and make appropriate recommendations to take things even further. This work on prevention and ecodesign plans, and the commitment of producers to areas that complement the mandatory areas, such as repair/repairability, are **very positive signs** that**waste prevention is being integrated at all stages of the product life cycle, beyond end-of-life and production**.

In purely operational terms, our analysis of the plans was complicated by the heterogeneity of producer situations. Some producers, for example, have contracts with **ecosystem** for several sectors (Household/Professional/Lamp/Small fire extinguisher) in which **ecosystem** is approved. Therefore, it was sometimes difficult to know which actions specifically concerned the Professional WEEE sector. Similarly, some manufacturers who market equipment in more than one sector submitted a single plan, without any segmentation by sector. Numerous actions in the plans submitted also concern the packaging scope in sections dedicated to products. **ecosystem** must therefore **continue to raise producer awareness of the need to complete the template correctly and enable them to specify the scopes addressed and the associated commitments as and when the plans are updated**.

The AGEC anti-waste law has accelerated the process of transforming business practices and models towards a circular economy. The main trends emerging from this summary have made it possible both to observe a growing awareness among producers and to identify relevant actions aimed at reducing waste, integrating an ecodesign approach as well as other key principles of the circular economy, notably through the repair and re-use of products, but also on other aspects such as supply chain management. On this last point, despite the difficulty many non-manufacturer producers have in identifying levers for action, it is worth noting their willingness to encourage the suppliers and manufacturers of their upstream products to improve ecodesign. **In addition to support for ecodesign, we can also provide real added value in the implementation of sustainable and circular purchasing strategies focused on material efficiency.**

Link with other industry standards and regulations, and **ecosystem** support for ecodesign

For many years, **ecosystem** has already worked to support its producers in ecodesign and the circular economy, promoting the second life of materials and more recently, the extension of equipment life. All these services are described on the company's website (ecosystem, Eco-conception de vos produits, 2023). **ecosystem** support is structured around eight pillars:

- Know your ecodesign obligations
- Be trained in the circular economy and ecodesign
- Discover WEEE recycling and its environmental impact
- Ecodesign your products for their second life or end-of-life management
- Assess the recyclability and environmental impact of your products
- Develop products with a circular approach
- Innovate through our research and development projects
- Benefit from ongoing support.

For example, between 1st January and 1st November 2023:

- 869 participants attended the support sessions
- 77 different types of support were provided
- 509 responses were received by e-mail or telephone.

To support producers based on their specific constraints and level of maturity with regard to these issues, the table in appendix 3 summarises (non-exhaustively) the standards and regulations relating to the areas referred to in the template, as well as the **ecosystem** support already in place to address these issues.

Outlook and conclusions

This year's work has enabled **ecosystem** to consolidate its support for ecodesign in its areas of expertise (second life of materials and products) and to restructure its actions to offer tools suited to the different levels of producer maturity. There is still room for improvement in many areas and the outlook for the next period is bright.

One way forward is to consolidate the existing reporting system, and thus the format of the plans developed by producers and collected by **ecosystem**. An online submission template is envisaged to facilitate the extraction of the resulting data for **ecosystem** and to facilitate the transmission of this data by producers. **In consultation with producers, ecosystem is also considering the enhancement of inspiring actions identified through the plans**, to share appropriate elements while ensuring the confidentiality of such actions. **These discussions will provide an opportunity to pursue dialogue with producers on prevention and ecodesign plans, and to work together to lay the foundations for tomorrow's plans.**

ecosystem intends to continue strengthening its relations with other Producer Responsibility Organisations, as cooperation between PROs and EPR sectors is key to successfully scaling-up waste prevention and ecodesign. By sharing our experience, our visions and our actions, synergies can be identified, enabling us to go further and be even more relevant in our analyses.

In terms of the analysis of results, **ecosystem** wishes to continue working on the level of commitment set out in section (4) "Quality-related feedback on plans received".

A more detailed assessment of engagement other than the three-level scale is envisaged to develop greater detail in our analysis. A more detailed analysis per equipment category is also under consideration, to provide more specific ecodesign recommendations based on their categories and specific requirements.

Producers are advised to update their prevention and ecodesign plans regularly (at least every year). Regulations specify that this review must be carried out at least every five years. Producers who submitted their plans in July 2023 are therefore required to submit a new version before July 2028. **ecosystem** will respond to its producers in due course regarding the format and conditions of this submission.

Finally, **ecosystem** would like to thank all its members who submitted their plans and those who are continuing to work on them, as well as all the internal and external stakeholders who took part in the project. **ecosystem** is already working on the next summary of these plans, which will be published in three years as required by the regulations, i.e. before the end of 2026.

7. Glossary and abbreviations

AGEC (Law) - Anti-Gaspillage pour une Economie Circulaire anti-waste law for a circular economy: French law aimed at transforming the linear "produce, consume, dispose" economy into a circular one. It is divided into five main areas:

- Cease the use of single-use plastic;
- Better inform consumers;
- Combat waste and promote solidarity-based reuse;
- Take action against programmed obsolescence;
- Produce more wisely.
  (Service Public, 2023)

BFR - Brominated Flame Retardant: chemical compound containing the element Bromine, man-made and added to various products to make them less easily flammable, notably for industrial use. They are commonly used in electrical and electronic equipment and there are five main categories:

- Polybrominated diphenyl ethers (PBDEs)
- Hexabromocyclododecane (HBCDD)
- Tetrabromobisphenol A (TBBPA) and other phenols
- Polybrominated biphenyls (PBBs)
- Other brominated flame retardants

(**ecosystem** definition)

Circular Economy: a model that can be defined as an economic system of exchange and production which, at all stages of the product life cycle (goods and services), aims to increase the efficiency of resource use and reduce environmental impact, while enhancing the well-being of individuals. The circular economy can be broken down into three areas and seven pillars, including recycling, extending useful life through reuse, repair and re-use, and ecodesign (ADEME definition, 2023)

CPP - Comité des Parties Prenantes (Stakeholder Committee): committee led by **ecosystem**, incorporating various stakeholders (producers, NGOs, elected representatives, operators, etc.) (**ecosystem** definition).

Ecodesign: a preventive approach that integrates environmental protection into the design of goods and services. Its aim is to reduce the environmental impact of products throughout their life cycle from extraction of raw materials to production, distribution, use and end of life. It is characterised by a broad view of these environmental impacts: it is also a multi-stage approach (incorporating the different stages of the life cycle) and multi-criteria (taking into account material and energy consumption, emissions into the natural environment, effects on climate and biodiversity, etc.). (Minsitère de la Transition Ecologique, 2023)

EEE - Electrical and Electronic Equipment: equipment operating "by means of electric currents or electromagnetic fields, and equipment for the generation, transfer and measurement of such currents and fields, designed for use at a voltage not exceeding 1,000 volts for alternating current and 1,500 volts for direct current (Legifrance, Article R543-172 - Code de l'environnement, 2022)

EPR - Extended Producer Responsibility: extended responsibility for producers to collect or arrange for the collection and treatment of separately collected waste, regardless of when the equipment was put on the market. These obligations are divided between producers according to the categories and sub-categories of equipment defined in paragraph II of article R. 543-172. (Legifrance, Décret n° 2020-1725 du 29 décembre 2020 portant diverses dispositions d'adaptation relatives à la responsabilité élargie des producteurs, 2020)

ErP - Energy related Products: any good having an impact on energy consumption during its use, which is placed on the market and/or put into service, including parts intended to be incorporated into an energy related product covered by the Directive and which are placed on the market and/or put into service as spare parts for end-users, and whose environmental performance can be independently assessed. (EUR-LEX, Directive 2009/125/CE, 2009)

GHG - Greenhouse gases: These are gaseous constituents of the atmosphere, both natural and anthropogenic [resulting from human activities], which absorb and emit radiation emitted by the Earth's surface, atmosphere and clouds. This property is responsible for the greenhouse effect, a radiative effect resulting from the absorption of infra-red radiation. The increase in the concentration of these gases in the atmosphere contributes to a rise in temperature, contributing to climate change. Water vapour (H2O), carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4) and ozone (O3) are the main greenhouse gases. In addition to CO2, N2O and CH4, other gases resulting from human activities, such as fluorinated gases like HFCs, PFCs and NF6, also contribute to the additional greenhouse effect and climate change. These gases are monitored under the Kyoto Protocol. (GIEC, 2013)

Household vs. Professional: equipment is considered to be professional if, by its very nature, it is intended exclusively for professional use. All other electrical equipment is considered Household (ecosystem, 2023)

LCA - Life Cycle Assessment: compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system over its life cycle. The life cycle is characterised as the consecutive and interrelated phases of a product system, from the acquisition of raw materials or the generation of natural resources through to final disposal. (ISO14040:2006)

Manufacturer: producer responsible for the manufacture and/or assembly of the product(s) marketed (**ecosystem** definition)

Non-manufacturer: a producer who is not considered a manufacturer under the definition above and who may be an introducer (outside the EU), importer (EU), remote seller or own-brand vendor (**ecosystem** definition)

Non-renewable (or exhaustible): refers to a material whose rate of destruction exceeds the rate of creation, whether by a wide margin or not. Some examples for the industry: all metals, fossil-derived thermosets and thermoplastics (plastics), glass, etc. (**ecosystem** definition)

PPE - Plan de Prévention et d'Ecoconception (prevention and ecodesign plan): a plan drawn up by the producer and revised every five years, with the aim of reducing the use of non-renewable resources, increasing the use of recycled materials and increasing the recyclability of its products in processing facilities located in France. (Legifrance, Article L541-10-12 - Code de l'environnement, 2020)

PPE - Plan de Prévention et d'Ecoconception Collectif (collective prevention and ecodesign plan): prevention and ecodesign plan consolidated by a Producer Responsibility Organisation to represent the sector (**ecosystem** definition)

PPE - Plan de Prévention et d'Ecoconception commun (joint prevention and ecodesign plan): prevention and ecodesign plan drawn up jointly by several independent producers who are not part of the same group (**ecosystem** definition).

PPE - Plan de Prévention et d'Ecoconception Individuel (individual prevention and ecodesign plan): prevention and ecodesign plan developed by a single producer (**ecosystem** definition)

Prevention: all measures taken before a substance, material or product becomes waste, when these measures contribute to the reduction of at least one of the following items:

- the quantity of waste generated, including through the re-use or extension of the useful life of substances, materials or products;
- the harmful effects of waste products on the environment and human health;

- the content of substances hazardous to the environment and human health in substances, materials or products.

(Legifrance, Article L541-1-1 - Code de l'environnement, 2020)

Producer: any natural or legal person who, regardless of the sales technique used, including by remote methods such as mail order, internet or telephone:

- is incorporated in France and manufactures electrical and electronic equipment under its own name or brand, or has electrical and electronic equipment designed or manufactured and markets it under its own name or brand in France;
- is incorporated in France and resells, under its own name or brand, equipment produced by other suppliers, the reseller not being considered as a "producer" when the producer's brand appears on the equipment in accordance with a;
- is incorporated in France and sells, on a professional basis, electrical and electronic equipment from a third country or another member state;
- is incorporated in another Member State or in a third country and sells electrical and electronic equipment in France by means of remote methods directly to households or to users other than households.

(Legifrance, Article R543-174 - Code de l'environnement , 2021)

REACH - Registration, Evaluation, Authorisation and restriction of CHemicals: European Union regulation adopted to better protect human health and the environment against the risks associated with chemical substances, while promoting the competitiveness of the EU chemical industry. (ECHA, 2023)

Recyclable: a material or component that can effectively be recycled with waste from identical or similar products. Recyclability is characterised by:

- Being suitable for efficient collection on a regional scale, through access to local collection points;
- Being suitable for sorting i.e. directed to recycling channels for recycling;
- The absence of elements or substances that interfere with sorting and recycling or limit the use of recycled material;
- The ability to ensure that the recycled material produced by the recycling processes used represents more than 50% by mass of the waste collected;
- Being suitable for recycling on an industrial scale and in practice, in particular by guaranteeing that the quality of the recycled material produced is sufficient to ensure long-term outlets, and that the recycling chain can demonstrate a strong capacity to handle products that can be integrated into it.

(JORF n°0101, 2022)

Recycled (material): refers to a material that is recovered from the waste generated. The material may be "pre-consumer" or "post-consumer". The term "pre-consumer" material is used when it is diverted from the waste generated during a manufacturing process, excluding the reuse of materials such as those resulting from reprocessing, regrinding, or residues generated by a given process, and which are re-injected into the same process [same manufacturing operation for the same type of product] that generated them. "Post-consumer" materials are those recovered from waste generated by Professionals or by commercial, industrial, or institutional facilities in their role as end-users of a finished product. This includes returns of products or their constituent parts, from the distribution of finished products to end users. The terms "recycled material" and "secondary material" have the same meaning.(Comité Européen de Normalisation (CEN), 2020)

Recycling: any recovery operation whereby waste, including organic waste, is reprocessed into substances, materials, or products for use in its original function or for other purposes. (Legifrance, Article L541-1-1 - Code de l'environnement, 2020)

Renewable: refers to a material whose stock can be replenished over a short period of time on the human time scale, renewing itself at least as fast as it is consumed. Some examples for the industry: bamboo fibre, certain types of wood, biosourced plastics based on corn starch or cane sugar, for example, certain rubbers, etc. (**ecosystem** definition)

Re-use: any operation by which substances, materials or products that are not waste are used again for a purpose identical to that for which they were designed. (Legifrance, Article L541-1-1 - Code de l'environnement, 2020)

RoHS - Restriction of Hazardous Substances: European directive aimed at limiting the use of 14 hazardous substances in electrical and electronic products. (EUR-LEX, 2011)

SSE - Social and Solidarity Economy: a group of companies structured in the form of cooperatives, mutual companies, associations or foundations, whose internal operations and activities are based on a principle of solidarity and social utility. (Ministère de l'Economie et des Finances, 2023)

Waste: any residue from a production, transformation or use process, any substance, material, product or more generally, any movable asset abandoned or intended for abandonment by its holder. (Legifrance, 2020)

WEEE - Waste Electrical and Electronic Equipment: the term applies to electrical and electronic equipment, as well as the waste arising from it, including all components, sub-assemblies and consumables that are an integral part of the product at the time of disposal. (ecosystem, 2023)

8. Bibliography

ADEME (2023). *Expertises - Economie Circulaire*. Retrieved from https://expertises.ademe.fr/expertises/economie-circulaire

Comité Européen de Normalisation (CEN). (2020). *EN 45557 - Méthode générale pour l'évaluation du contenu en matériaux recyclés des produits liés à l'énergie*.

ECHA. (2023). *Comprendre REACH*. Récupéré sur https://echa.europa.eu/fr/regulations/reach/understanding-reach

ecosystem. (2023). *Eco-conception de vos produits*. Récupéré sur https://pro.ecosystem.eco/profil/producteur#104

ecosystem. (2023). *Qu'est-ce qu'un DEEE, D3E ou déchet d'équipement électrique et électronique ?* Récupéré sur https://www.ecosystem.eco/comprendre/deee

EUR-LEX. (2009, 10 21). *Directive 2009/125/CE*. Récupéré sur https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:32009L0125

EUR-LEX. (2011, juin 8). *Directive 2011/65/UE du Parlement européen et du Conseil du 8 juin 2011 relative à la limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques (refonte)*. Récupéré sur https://eur-lex.europa.eu/legal-content/FR/ALL/?uri=CELEX:32011L0065

GIEC. (2013). Récupéré sur https://www.ipcc.ch/site/assets/uploads/2018/08/WGI_AR5_glossary_FR.pdf

ISO14040:2006. (s.d.). *ISO 14040:2006(fr) Management environnemental — Analyse du cycle de vie — Principes et cadre*. Récupéré sur iso.org: https://www.iso.org/obp/ui/fr/#iso:std:iso:14040:ed-2:v1:fr

JORF n°0101. (2022, avril 30). *Décret n° 2022-748 du 29 avril 2022 relatif à l'information du consommateur sur les qualités et caractéristiques environnementales des produits générateurs de déchets*. Récupéré sur https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000045726094

Legifrance. (2020, février 12). *Article L541-10-12 - Code de l'environnement*. Récupéré sur https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000041569472/2021-04-09

Legifrance. (2020, juillet 31). *Article L541-1-1 - Code de l'environnement*. Récupéré sur https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000042176087/2023-10-09

Legifrance. (2020, décembre 29). *Décret n° 2020-1725 du 29 décembre 2020 portant diverses dispositions d'adaptation relatives à la responsabilité élargie des producteurs*. Récupéré sur https://www.legifrance.gouv.fr/jorf/id/JORFARTI000042754045

Legifrance. (2021, janvier 1). *Article R543-174 - Code de l'environnement* . Récupéré sur https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000042962321/

Legifrance. (2022, janvier 1). *Article R543-172 - Code de l'environnement*. Récupéré sur https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000044096673/

Ministère de l'Economie et des Finances. (2023, juillet 27). *Qu'est-ce que l'économie sociale et solidaire (ESS) ?* Récupéré sur https://www.economie.gouv.fr/cedef/economie-sociale-et-solidaire

Minsitère de la Transition Ecologique. (2023, janvier 30). *L'éco-conception des produits*. Récupéré sur https://www.ecologie.gouv.fr/leco-conception-des-produits

APPENDICES

ecosystem

recycler c'est protéger

Appendix 1: Mandatory area trends

Reduction in the use of non-renewable materials

SUB-AREA: IDENTIFY AND REDUCE NON-RENEWABLE MATERIALS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Identification of non-renewable materials: the producer strives to identify non-renewable materials used in the manufacture of its products, such as fossil-derived plastics and metals (such as copper, aluminium, iron and rare earths for some)		1	Reduction in the use of virgin plastic: A major trend is to reduce the use of virgin plastic with very different objectives depending on the producer	
2	Reduction in the use of non-renewable materials: The aim is to reduce the use of non-renewable materials in product design and manufacture		2	Product life cycle assessment: Several companies complete product material assessments as part of their life cycle assessment to identify their precise composition	
3	Use of recyclable materials: The use of recyclable materials is encouraged to replace non-renewable materials, but certain concerns are raised in terms of product strength and regulatory compliance		3	Identification of non-renewable materials: the producer strives to identify non-renewable materials used in the manufacture of its products, such as fossil-derived plastics and metals (such as copper, aluminium, iron and rare earths for some)	
4	Classification of materials according to their recyclability: the producer seeks to classify materials according to their recyclability to guide product design.		4	Material impact rankings: Some companies have developed an internal ranking system to assess the impact of materials used	
5	Use of renewable materials: Focus on designing sustainable products with a long lifetime, using renewable materials whenever possible		5	Reduction in the use of non-renewable materials: The aim is to reduce the use of non-renewable materials in product design and manufacture. This incorporates actions such as using local suppliers, lead-free soldering techniques, and assessing the quantity of non-renewable materials in products	
6	Life Cycle Assessment: A life cycle assessment is done to assess the distribution of materials and to analyse how renewable each material is		6		

7	Training and awareness raising: the producer is committed to training its employees in understanding the concept of non-renewable materials and to encourage environmentally responsible practices.		7		

SUB-AREA: RATIONALISE THE QUANTITIES OF MATERIALS AND COMPONENTS USED

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Ecodesign: the producer seeks to reduce the resources used in the product design and manufacturing process as far as possible. This includes reducing the number of unnecessary components and reusing materials		1	Product weight reduction: One of the main trends is to reduce the weight of products while maintaining their power and efficiency	
2	Production optimisation: There is a strong focus on reducing production waste and processes. Moulding scrap is reincorporated and metal cutting waste is recycled. Best practices are also shared to limit waste at source		2	Optimised product packaging: Measures are taken right from the planning and design of products to use fewer resources and components. This includes reducing the variety of components and materials	
3	Standardisation: the manufacturer strives to standardise product design, making it as modular as possible to limit the diversity of materials and components, thus achieving economies of scale		3	Component rationalisation: Another trend is component rationalisation, which means simplifying and reducing the number of components used in products, to reduce waste and improve the efficiency of the manufacturing process	
4	Product mass reduction: The aim is to reduce product mass while maintaining equivalent performance, thereby reducing the quantity of materials used		4	Use of recycled materials with a focus on plastics: The use of recycled materials is encouraged, helping to reduce dependence on virgin raw materials	
5	Consider accessories (e.g. charger, screws, power cable, etc.)		5	Standardisation of materials: Some companies are seeking to standardise the materials and components used in their products to simplify spare parts management and reduce the diversity of materials	
6			6	Reduction in packaging: Efforts are made to minimise product packaging and optimise the size of shipping cartons	
7			7	Modular design: Modular product design is indicated as an approach to reduce the variety of materials and components.	

SUB-AREA: OTHER AVENUES IDENTIFIED BY PRODUCERS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Component retrofit: Reuse as many components as possible to extend product lifespan		1	Prevention and Ecodesign Plan: the producer plans to contact suppliers who are also subject to the Prevention and Ecodesign Plan obligation	
2	Reducing Standby Power: Reduce standby power consumption of mains-connected appliances sold by the producer		2	Reuse: the producer plans to reuse unused stock items, withdraw older products containing non-renewable materials from the market, and develop reusable products	
3	Creation/update of tools: Develop a tool for selecting raw materials according to their environmental impact		3	Promotion of eco-responsible products: the producer wishes to promote environmentally-friendly products through specific promotional campaigns	
4	Best practice guide for ecodesign: Create a best-practice guide for ecodesign, particularly with regard to disassembly, duplicate moulding and choice of materials		4	Reduction in packaging: the producer aims to reduce packaging for new products and to consider short and closed circuits	
5	Material-efficient 3D printing: Use of 3D printing with optimal material management		5	Cooperation with suppliers: the manufacturer seeks to establish closer relations with its suppliers to gain better knowledge of components and promote ecodesign	
6			6	Raising employee awareness: the producer makes its employees aware of the importance of a circular economy and undertakes to train its teams	

Increased use of recycled materials

SUB-AREA: MAXIMISE THE USE OF RECYCLED MATERIALS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Recycled plastic integration target: The aim is to set a rate for recycled plastic content in the manufacture of plastic parts.		1	Use of recycled materials: Many companies are committed to using recycled materials in their products, whether recycled plastic, recycled steel or other materials	
2	Prioritise the use of recycled materials: Prioritise the use of recycled materials in the development of new products, and assess supplier and technical constraints for the integration of recycled materials.		2	Ecodesign: producers plan to design their products in such a way to enable the incorporation of recycled materials, using appropriate functional specifications	
3	Incorporation of priority recycled materials: The aim is to require the incorporation of recycled materials for materials identified as priorities among strategic suppliers		3	Collaboration with suppliers: producers work with their suppliers to promote the use of recycled materials in existing and new products, and include clauses on the incorporation of recycled plastic in purchasing contracts	
4	Creation of a list of raw materials: Create a list of raw materials for which a minimum level of recycled content will be required from suppliers		4	Environmental certification: Some products are subject to environmental certification requiring the use of a minimum of 50% recycled materials	
5	Life Cycle Assessment: Conduct an environmental assessment of products and communicate with suppliers to estimate the proportion of recycled materials		5	Repair of defective products: manufacturers are considering repairing defective spare parts rather than disposing of them, in order to extend product life	
6	Investigation of traceability of recycled materials: Examine the implementation of a traceability system for recycled materials within products		6	Reduction in carbon footprint: Some companies are setting targets to reduce their carbon footprint by using recycled materials and optimising their sourcing	
7	Recycling materials: Research opportunities to recycle materials, to identify other sources of recycled materials		7	Material efficiency analysis: Companies analyse the efficiency of recycled materials compared with virgin materials, seeking to maximise their use	

SUB-AREA: IDENTIFY SUPPLIERS AND CREATE PARTNERSHIPS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Regulatory and environmental compliance: Indications are made that products must comply with regulations, which may require the use of recycled materials		1	Integration of recycled plastics: the producer is working on the efficient use of resins recovered from used household appliances, focusing on polypropylene (PP), acrylonitrile butadiene styrene (ABS) and polystyrene (PS) resins with a purity of over 99%	
2	Supplier management: the producer manages its suppliers, in particular by assessing their interest in the matter and collecting information on the materials used		2	Collaboration with local recycling operators: the producer works with local partners specialising in waste recycling to guarantee a sustainable supply of recycled materials	
3	Collaboration with partners: the producer actively collaborates with various stakeholders, including suppliers, to promote the use of recycled materials and contribute to the circularity of materials		3	Selection of responsible suppliers: the producer seeks to identify suppliers who use recycled materials, practice ecodesign and adopt responsible practices	
4	Search for alternative and innovative suppliers: the producer seeks to identify and list potential suppliers of alternative or recycled materials for various types of non-renewable materials		4	Supplier audits: the producer conducts regular audits to assess the environmental practices of its suppliers and ensure their compliance with sustainability standards	
5	Transparency and monitoring: the producer deploys tools to collect indicators on the recycled material rate and the environmental impact of materials used by suppliers		5	Raising supplier awareness: the producer makes its suppliers aware of its overall strategy to reduce its environmental footprint, and encourages collaboration on more environmentally-friendly products	
6	Supply chain optimisation: the producer seeks to maximise its business partnerships with suppliers committed to ecodesign and to reduce supply distances		6	Recycled materials price watch: the producer monitors the price of recycled materials in order to integrate them effectively into its manufacturing processes	

TRENDS IN OTHER AVENUES IDENTIFIED BY PRODUCERS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Supplier consultation: The aim is to consult priority suppliers on their recycled content to encourage the use of recycled materials.		1	Development of a responsible purchasing policy: the producer plans to develop a responsible purchasing policy, in particular by increasing the proportion of recycled plastic in the total volume, using closed-loop recycling pilot schemes and determining the potential of recycled materials in terms of quality	
2	Calculation of recycled content: the producer aims to define a methodology to calculate the recycled content of finished products and to enter this information in dedicated data systems		2	Sustainability criteria for supplier selection: the producer plans to establish sustainability criteria for supplier selection, as well as regular supplier sustainability assessments and random risk-based audits	
3	Internal awareness: Internal employees will be made aware of the environmental benefits of recycled materials.		3	Raising awareness among manufacturers and suppliers: the producer seeks to raise awareness of regulatory issues amongst its manufacturers and suppliers, and to promote the incorporation of recycled materials in their products	
4	Biosourced materials: R&D teams work on the use of biosourced materials to complement recycled materials		4	Raising customer awareness: the producer plans to raise customer awareness of the use of recycled materials, encouraging them to choose products made from recycled materials and to participate in recycling programs	
5	Use of recycled materials: the producer plans to introduce the use of recycled paper for packaging materials		5		
6	Traceability of recycled materials: the producer is working on improving the traceability of recycled material content in its data systems, mirroring the requirements for Household products under Article 13 of the AGEC anti-waste law		6		

Improved product recyclability

SUB-AREA: CHOOSE RECYCLABLE MATERIALS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Replace plastics that are difficult to recycle with materials that are easy to recycle: The aim is to replace non-recyclable plastics with recyclable materials		1	Use recyclable materials: Several companies mention their use of recyclable materials such as aluminium, steel, recyclable plastic, etc. in the manufacture of their marketed products	
2	Identify materials that are not or only slightly recyclable: The emphasis is on knowing which materials to avoid in products to facilitate recycling.		2	Encourage recyclability: producers are creating incentives and selection criteria to encourage the use of recyclable materials in their products	
3	Favour single-material components: Single-material components are easier to recycle than multi-material components		3	Designer training: Training for designers is mentioned to ensure that the selection of recyclable materials is a priority in the development of new projects	
4	Promote 100% recyclable product ranges: Efforts are being made to design fully recyclable products, notably through 3D printing		4	Regulatory understanding: producers refer to regulations such as Article 13 of the AGEC anti-waste law to adapt it to Professional equipment	
5	Classify materials according to their recyclability: An evaluation of materials is undertaken to help design products according to their recyclability.		5	End-of-life product return: Some manufacturers are planning to set up partnerships to collect end-of-life parts and products directly from their customers	
6	Assess the recyclability of new product components: A process has been set up to assess the recyclability of new product components right from the design stage		6	Strengthen relationships with suppliers: producers are seeking to strengthen their relationships with suppliers who use more recyclable materials in their products	
7	Strengthen relationships with suppliers to include more recyclable materials: Close collaboration with suppliers is encouraged to integrate more recyclable materials into products.		7	Eco-selection: producers integrate eco-selection criteria into their product development processes to maximise recyclability	
8			8	Evaluation of recyclability: producers assess the recyclability of their products and seek to increase the proportion of recyclable materials used	
9			9	Use of recycled materials: Some companies mention their use of recycled materials such as recycled plastic in their products	

SUB-SECTOR TRENDS: ENSURE PARTS ARE SEPARABLE

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Ecodesign and product recyclability: Producers emphasise the importance of designing products to facilitate recycling. This means designing products that can be disassembled, with an emphasis on separability of parts to improve recyclability.		1	Product separability: the manufacturer focuses on the importance of designing products with enhanced separability, i.e. the ability to easily disassemble components for repair, recycling or replacement	
2	Reducing irreversible bonds: It is clearly stated that the use of irreversible bonds such as adhesive bonding, duplicate moulding and welding should be reduced. The aim is to make products easier to dismantle.		2	Repairability and recyclability: The aim is to make products more repairable and recyclable by avoiding the use of permanent assembly techniques such as welding or adhesive	
3	Modular design: Modular products are designed for easy disassembly and replacement of parts, helping to extend product life.		3	Collaboration with suppliers: producers work closely with their suppliers to ensure that products are designed with enhanced separability	
4	Focus on electronic components: commit to the separability of electronic components, which cannot always be disassembled due to their complexity		4	Modularity: Modular design is encouraged for easy separation of product parts	
5	Labelling: need to meet internal labelling/certification criteria for recyclability, particularly with regard to the dismantling of printed circuit boards, sensors and batteries		5	Raising customer awareness: manufacturers are seeking to make their customers aware of the importance of part separability to improve recycling	
6	Designer training: The aim is to raise awareness amongst designers of the recyclability of materials, and to involve buyers in training on the choice of materials.		6		
7	Provision of dismantling instructions: The idea is to provide dismantling instructions to facilitate the dismantling of products at the end of their life.		7		

SUB-AREA: RESTRICT/REDUCE THE PRESENCE OF RECYCLING DISRUPTORS AND HAZARDOUS SUBSTANCES

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Identification of regulated substances: All regulated substances in products must be identified and monitored in accordance with RoHS and REACH regulations. The importance of monitoring substances of very high concern is also emphasised.		1	Product life-cycle analysis: the producer develops material footprints for its products to identify their precise composition as part of the life cycle analysis.	
2	Reducing substances of concern: The aim is to reduce the presence of toxic substances, such as brominated flame retardants, additives, surface treatments etc.		2	Regulatory compliance: the manufacturer complies strictly with European regulations, notably RoHS and REACH, in addition to its own internal regulations on the use of potentially hazardous substances	
3	Facilitated recycling: This includes reducing the use of materials that are difficult to recycle and adding markings indicating the material and recyclability of plastic components.		3	Partnerships for safer products: the producer engages in partnerships with other industry players to identify harmful chemicals and safer alternatives even before regulations require them. The producer favours the selection of compliant suppliers	
4	Raising awareness of recyclability: Recycling guides are created for consumers, and there are plans to offer training in best recycling practices.		4		
5	Reduction in the use of halogenated substances: The aim is to ban halogenated substances from product manufacturing.		5		

SUB-AREA: RATIONALISE THE DIVERSITY OF MATERIALS AND COMPONENTS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Reduce the number of components managed in computer systems: This action consists of minimising the number of different components used in products to simplify management and reduce complexity		1	Component pooling: The aim is to pool the components used between different product models in the same range, and even between different ranges, in order to reduce the number of components	
2	Assessment of new product recyclability: This action aims to assess the recyclability of new products, using REEECYCLAB software for example		2	Standardisation of materials: The emphasis is on the use of a single type of material for plastic injection moulding, and on the standardisation of materials to reduce the variety of components	
3	Purchasing strategy to reduce the number of suppliers and items: Streamline the supply chain by reducing the number of suppliers and items to optimise costs and reduce the diversity of materials		3	Reduction in materials and components, especially polymers: A quantified reduction in the materials and components used is indicated as a target	
4			4	Modularity: The use of a modular system is encouraged to enable components to be compatible with each other.	
5			5	Optimisation of production processes: Analysis of production processes is done to identify opportunities for optimisation and simplification, thus reducing component diversity	

TRENDS IN OTHER AVENUES IDENTIFIED BY PRODUCERS

Priority	MANUFACTURER	Class	Priority	NON-MANUFACTURER	Class
1	Recycling composite materials: The aim is to implement recycling processes for composite materials used in products		1	Employee awareness and training on end-of-life products	
2	Promotion of re-use: The aim of this action is to encourage reuse after their end-of-life		2	Prevention and Ecodesign Plan: the producer plans to contact suppliers who are also subject to the Prevention and Ecodesign Plan obligation	
3	Measurement of the repairability index: This action involves assessing the ease with which products can be repaired by adapting the existing standard for certain Household equipment		3	Measurement of the repairability index: This action involves assessing the ease with which products can be repaired by adapting the existing standard for certain Household equipment	
4	Inform equipment collectors/distributors about the ecosystem initiative: the producer wishes to raise awareness of the ecosystem initiative among collectors/distributors and direct them to appropriate collection points		4	Reduction in paper consumption by converting product documentation to digital	
5	Analyse recyclability through dismantling: We plan to work with dismantlers to analyse the recyclability of products		5	Assessment of the recyclability of products sold in collaboration with manufacturers	
6	Duplicate what is done for Household products and declare the recyclability of products in accordance with the AGEC law: the producer undertakes to disclose the recyclability of its products in accordance with the AGEC law		6	Preference for the modular eco-selection approach in the choice of goods imported	

Appendix 2: Supplementary area trends

For each of the supplementary areas, the analysis of major trends was based on the recurrence of engaging actions for each of the sub-areas proposed in the **ecosystem** template. A classification of each sub-area and a breakdown according to the key measures identified are provided in the tables presented in the following sections, again with a distinction between manufacturer and non-manufacturer producers. Packaging remains outside the scope of this assessment, despite multiple actions indicated in this respect. As a reminder, a dedicated prevention and ecodesign plan must be drawn up for the producers concerned (i.e. those subject to the Packaging EPR sector).

Product design to extend their useful life

Priority	MANUFACTURER	Priority	NON-MANUFACTURER
1	**Ensure repairability and retrofit (disassembly, information and spare parts):** - Improvement of product repairability through the implementation of repairability criteria with their integration during product development - Availability of spare parts to facilitate product repair with the guarantee of the duration of parts availability - Provision of documentation and information for the disassembly and repairability of equipment - Improvement of design with recommendations that take into account the disassembly of parts (electronic components) and therefore repairability - Development of skills and training in repair - Certification and labelling approach	1	**Ensure repairability and retrofit (disassembly, information and spare parts):** - Improvement of product repairability through the implementation of repairability criteria with their integration during product development - Availability of spare parts to facilitate product repair, with guaranteed duration of parts availability - Provision of documentation, information and guidelines for customers on equipment repairability Self-repair training. - Incentives and awareness raising for suppliers if the company is not in control of design - Development of after-sales service to encourage equipment repair - Certification and labelling initiatives
2	**Develop scalable products that can be upgraded and updated/reconditioned/re-manufactured:** - Reconditioning of products and second-hand sales - Guarantee of equipment upgrades without altering operation (fight against obsolescence) - Design integrating product modularity and upgradability. - Parts accounting applied to several product ranges. Standardisation - Development of accessories and options without changing the product	2	**Maximise robustness and reliability:** - Improvement of reliability by implementing quality, control and testing procedures - Use of resistant materials - Extension of the warranty period - Selection of suppliers offering more robust products + work with and encourage existing suppliers. Eco-selection of products according to their reliability - Better integration of reliability and robustness in the design stages - Monitoring and reduction in the number of defects through the implementation of action plans - Optimisation of certain parts and components such as batteries
3	**Maximise robustness and reliability:** - Choice of quality materials and components as a priority - Monitoring and reduction in the number of defects by implementing action plans - Design choices to improve robustness - Extension of the warranty life of equipment	3	**Develop scalable products that can be upgraded and updated/reconditioned/re-manufactured:** - Guarantee to update equipment without altering its functioning (fight against obsolescence) - Reconditioning of products and second-hand offer

	- Evaluation and improvement of service life with quantified targets (e.g. minimum of 15 years)		- Selection of suppliers and collaboration to offer upgradeable and robust products - Product development with the possibility of integrating the latest parts and components - Repairability criteria with provision of spare parts
4	**Standardise materials, parts and components:** - Reduction in the number of materials and components used - Standardisation of parts and components, pooling and reuse across several ranges - Development of simple/streamlined designs - ecodesign approach with integration of modularity	4	**Design for multiple uses and users facilitate a second life:** - Development of collection for reuse - Design of repairable/reusable products with new parts. Multi-functionality - Sharing economy via the economy of functionality - Promotion of more durable and easily reusable products - Increase in the proportion of second-hand products sold
5	**Design for multiple uses and users facilitate a second life:** - Choice of modular design and provision of standard parts and sub-assemblies - Introduction of tutorials for disassembly and reconditioning - Multifunctional products - Development of second-hand product sales	5	**Standardise materials, parts and components:** - Standardisation of parts and components, pooling and reuse across several ranges - Reduction in the number of material and component part references and ranges - Influence with suppliers - Integration of repairability and extended service life criteria

Services and support to extend useful life

Priority	MANUFACTURER	Priority	NON-MANUFACTURER
1	**Offer repair services (user services, spare parts, etc.):** - Improved after-sales service with availability of spare parts for all products + warranty period - Provision of product and parts drawings to facilitate repair - Awareness-raising and training (customers and businesses) on maintenance and repair - Provision of video tutorials, guides, maintenance tips and explanations (digital support) - Spare parts stock management	1	**Raise user awareness of proper product maintenance:** - Provision of video tutorials, guides, maintenance tips and explanations - Guarantee of a stock of standard spare parts (supply strategy) - Promotion of repair by directing customers to repairers - Digital delivery of required information to customers - Education of customers and distributors (dealers) on good maintenance practices
2	**Raise user awareness of proper product maintenance:** - Training and awareness-raising (customers, employees, vendors, installers) - Provision of the documentation needed to repair products - Reinforced communication with customers (advice at the time of sale) - Improved user manuals - Digital delivery of required information to customers	2	**Offer repair services (user services, spare parts, etc.):** - Provision of the documentation needed to repair products - Supply and availability of spare parts - Development of partnerships - Training and support for repairers - Drive customer awareness to repairs over new purchases - 3D printed spare parts for repair
3	**Promote/provide services for reuse, recycling and reconditioning:** - Development of reuse and reconditioning services (website) - Reuse platform - Development of sales of reconditioned products - Development of partnerships with reconditioners	3	**Promote/provide services for reuse, recycling and reconditioning:** - Implementation of reconditioning processes - Second life policy for products returned by the user - Use of indicators to define targets - Sale of reconditioned and used products and second hand resale service - Development of partnerships with players in the reuse sector
4	**Develop/propose product updates/update services (aesthetic, software, functional, etc.):** - Software updates to maintain product performance - Digital technology - Remote equipment monitoring for maintenance and product updates (Digital) - After-sales service performance and customer care with information relay for updates/maintenance	4	**Develop/propose product updates/update services (aesthetic, software, functional, etc.):** - Software updates to maintain product performance - Product connectivity - Digital data (3D printing, QR Code for customer information) - Integration of obsolescence in product development - Development of product refurbishment and reconditioning offers

5	**Promote the sale of usage rather than products, and the sharing economy:** - Produce lease and rental packages - Provision of equipment for collective use - Consideration of new business models	5	**Promote the sale of usage rather than products, and the sharing economy:** - Product lease offers (long-term often evoked) - Promotion of product utility and maximisation of usage through awareness-raising - Consideration of new business models (concept of frugality evoked)

Product design to limit the impacts of use

Priority	MANUFACTURER	Priority	NON-MANUFACTURER
1	**Limit consumption (energy, water, consumables, etc.) during use:** - Use of an energy efficiency score for equipment - Improved energy efficiency incorporated in product design - Promotion of the most efficient equipment - Solutions for consumption tracking and optimisation during use (connected appliances) - Customer guidance on usage	1	**Limit consumption (energy, water, consumables, etc.) during use:** - Eco-selection of resource-efficient products - Consideration of ways to optimise product energy consumption - Product energy optimisation work with suppliers - Measurement systems incorporated into products. - Technical solutions for energy efficiency (standby optimisation)
2	**Facilitate eco-friendly actions (energy consumption, waste management, good product maintenance) by users:** - Provision of information and guidance on proper product maintenance - Automated system to optimise consumption (inputs, energy, etc.) - Improved information leaflets - Promotion of best practices at the end of equipment life (collection and recycling)	2	**Facilitate eco-friendly actions (energy consumption, waste management, good product maintenance) by users:** - User education and awareness via guides and tutorial videos - Automated system to optimise consumption (inputs, energy, etc.) - Promotion of good practices at the end of equipment life (collection and recycling)
3	**Ensure ease of maintenance:** - Provision of information and guides - Development of digital solutions - Communication on maintenance reminders (e.g. alarm systems) - Capitalisation/feedback on breakdowns - Consideration of maintenance needs in product design	3	**Ensure ease of maintenance:** - Maintenance advice provided to customer - Availability of spare parts - Development of digital solutions (e.g. IoT) - Extended warranties - Consideration of maintenance needs in product development
4	**Reduce emissions and discharges during the product life cycle:** - Consideration of energy performance criteria in product design - Reduction in the use of fluids with high warming potential in refrigeration circuits (substitution with less warming fluids) - Product evaluations (carbon footprint, LCA)	4	**Reduce emissions and discharges during the product life cycle:** - Integration of energy performance criteria in product development and selection - Product assessments (carbon footprint, LCA) - Compliance with substance regulations such as REACH and RoHS - Raise awareness to energy savings

Manufacturing and distribution processes, traceability

Priority	MANUFACTURER	Priority	NON-MANUFACTURER
1	**Reduce consumption and emissions associated with manufacturing processes:** - Reduction in energy and water consumption on manufacturing sites (quantified targets) - Reduction in waste and production optimisation - Reinforced quality processes - GHG emissions assessment and decarbonisation action plan - Incentives for suppliers	1	**Promote the use of renewable energies:** - Green electricity contracts, energy certificates and other credits (carbon neutrality) - Solar panels - Selection of suppliers in a committed approach to adopt the use of renewable energies - Decarbonisation
2	**Promote the use of renewable energies:** - Green electricity contracts, energy certificates and other credits (carbon neutrality) - Use of renewable energies on production sites (quantified targets of up to 100%) - Optimisation of heating network - Tracking/monitoring consumption and share of renewables - Solar panels - Incentives for suppliers (scope 3)	2	**Develop supply chain traceability and control:** - Traceability back to the raw material manufacturer - Responsible purchasing policy (supplier audit) with certification process - Regulatory compliance - Development of traceability for producers who do not have 100% visibility with their suppliers - Issues concerning critical materials, hazardous and regulated substances
3	**Limit distribution phases, consumption and waste:** - Reduction in air transport - Relocation of production - Optimisation of orders and transport - Reduction in intermediaries, direct sales or short circuits - Optimisation in production (assembly) - Reduction in GHG emissions (internal and suppliers scope 3)	3	**Limit distribution phases, consumption and waste:** - Decarbonisation of logistics and supply chain (favouring less polluting and more local means of transport) - Reduction in intermediaries, direct sales or short circuits - Optimisation of transport (truck load factor in particular) - Relocation of sourcing to local areas
4	**Minimise waste and production volumes:** - Reduction in scrap rates, optimisation of production - Recovery of production offcuts - Optimisation of production and stock volumes (also involving purchasing teams)	4	**Reduce consumption and emissions associated with manufacturing processes:** - GHG emissions assessment and decarbonisation action plan - Reduction in energy and water consumption on sites - Improved awareness and selection of suppliers according to these criteria

5	**Develop supply chain traceability and control:** - Implementation and modernisation of monitoring tools - Evaluation and monitoring of suppliers (focus on regulated substances, critical and strategic (and conflict-prone) mineral resources) - Regulatory compliance - Responsible purchasing policy	5	**Optimise product weight/volume ratio:** - Optimisation of transport and storage - Optimisation of products and packaging
6	**Optimise product weight/volume ratio:** - Optimisation of packaging - Choice of lighter materials - Optimisation of design in terms of part weight and volume	6	**Minimise waste and production volumes:** - Involvement of purchasing teams in inventory optimisation

Appendix 3: Link with other industry standards and regulations, and **ecosystem** support for ecodesign

Areas of prevention and ecodesign	Standard	Regulation	Focus on eco-modulation	ecosystem support
Reduce the use of non-renewable materials (area referred to in the law)	"Optimization of materials and manufacturing processes (World Class Manufacturing - WCM - type standards) - Integration of biosourced materials (NF 16575) and biodegradable materials (NF EN 12432)"			- ecodesign webinars - Best practice sheets by **ecosystem** --> focus on "renewable" materials e.g. wood in WEEE as a disrupter of recycling (except for a few very specific categories such as musical instruments)
Increase the use of recycled materials (area referred to in the law)	- EN 45 557 standard: evaluating the proportion of recycled material in a product	- Future developments in ecodesign directives	- Bonus linked to criteria on the progressive integration of post-consumer recycled materials	- Ecodesign webinars - Practical guide by **ecosystem** - integrating recycled plastic - Summary on the environmental benefits of recycled plastics - Support from **ecosystem** in the search for potential suppliers (plastics in particular) - Examination of sustainable purchasing (delivery in 2024) - Provision of LCI of recycled plastics - Chaire Mines Urbaines projects and other projects under development - email and telephone hotline

Increase product recyclability (area referred to in the law)	- Standard EN 45555: evaluate the recyclability of a product	- Future developments in ecodesign directives - WEEE Directive - Product substance regulations (RoHS, REACH, POP) - F-gas regulations	- Bonus related to absence of bromine in all plastic parts of more than 25 grams containing flame retardants, excluding printed circuit boards and power cables	- Ecodesign webinars - Best practice sheets by **ecosystem** -->Choice of materials and connections between parts/surface treatments - Recycling diagram - Customised workshops - Chaire Mines Urbaines projects - email and phone hotline
Product design to extend their useful life (supplementary area not referred to in the law)			- Bonus related to availability of spare parts for six product categories	- Ecodesign webinars - Ecodesign guide for longer service life in preparation (delivery in 2024) - Personalised workshops - Chaire Mines Urbaines projects - email and telephone hotline
Services and support to extend product useful life (supplementary area not referred to in the law)		- Reuse fund		- Management of Reuse fund - Webinar on circular business models - Chaire Mines Urbaines projects - Referral to specialist consultants
Product design to limit the impacts of use (supplementary area not referred to in the law)				- Webinar on circular business models - LCI on end-of-life and on recycled plastics - Referral to specialist consultants
Optimise product packaging				- Communication with approved Producer Responsibility Organisations in the packaging sector
Manufacturing and distribution processes,				- Ecodesign best practice sheets

traceability (supplementary area not referred to in the law)				

Other ecosystem support materials	
Ecodesign strategy decision-making process	Guide for implementing an ecodesign strategy
Ecodesign support	EEEASY programme
Budget	Relay of financial support from ADEME and BPI France
Employee training	Ecodesign webinars Circular economy certificate EEEASY Programme

If you have any questions, please contact:

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recycler c'est protéger