ecosystem
recycler c'est protéger

# Summary of Ecodesign and Prevention Plans developed by ecosystem producer members

# Household 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 Household sector | Manufacturer | 461 |
| | Non-manufacturer | 2468 |
| | Total Household | 2929 |
| Number of individual plans received by type of **ecosystem** producer members in the Household sector | Manufacturer | 112 |
| | Non-manufacturer | 692 |
| | Total Household | 804 |
| % of individual plans received in relation to the number of producer members in the Household sector | Total Household | 27% |
| % of individual plans received in relation to the tonnage of equipment put on the market in the Household sector | Total Household | 50% |
| Number of joint plans received from the Household sector | Total Household | 0 |

| **Mandatory areas of the AGEC anti-waste law** | **Main trends[1] in waste prevention and ecodesign in plans received from ecosystem producer members - Household** |
|---|---|
| **Reduction in the use of non-renewable materials** | Identification and evaluation of product constituent materials |
| | Reduction in the quantity of plastics used |
| | Substitution with renewable materials (natural or biosourced) |
| | Working with suppliers: awareness, evaluation, incentives |
| | Optimisation of dimensional characteristics: weight, volume, etc. |
| | Sustainable purchasing processes and optimised procurement |
| | Rationalisation of the diversity of materials and components used |
| | Reuse of components and standardisation across multiple products |
| | Rationalisation of products, ranges and variants |
| | Reduction of non-renewable materials in packaging |
| **Increased use of recycled materials** | Integration of recycled materials, higher incorporation rate |
| | Identification and assessment of recycled materials integrated and to be integrated |
| | Working with suppliers: awareness, evaluation, incentives |
| | Incorporation of recycled metals (steel, aluminium) |
| | Short-loop recycling/internal to the producer |
| | Identification of suppliers of recycled materials and partnerships with them |
| | Maximisation of the use of recycled materials in packaging |
| | Development of partnerships with recyclers and Producer Responsibility Organisations |
| | R&D projects and innovation for the integration of recycled materials |
| | Reuse of components in the manufacture of products[2] |
| **Improved product recyclability** | Assessment of the recyclability of existing products for improvement |
| | Working with suppliers: awareness, evaluation, incentives |
| | Consideration of component separability in design |
| | Rationalisation and pooling of materials (plastics) and components |
| | Compliance with REACH and RoHS requirements |
| | Assessment and tracking of recycling substances and disruptors |
| | Reduction or elimination of certain substances (solvents, BFRs, etc.) |
| | Development and selection of single-material products |
| | Easy access to electronic components (batteries, boards, cells) |
| | Choice of recyclable packaging |

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. reuse of components)

[2] Although this is an interesting way of reducing the amount of waste, the trend is not associated with an increase in the 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 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 WEEE (Waste Electrical and Electronic Equipment) EPR sector, this obligation applies to household appliance producers (manufacturers, introducers, importers/retailers, own-brand vendors, remote sellers), whether they are part of an individual system or a Producer Responsibility Organisation (PRO).

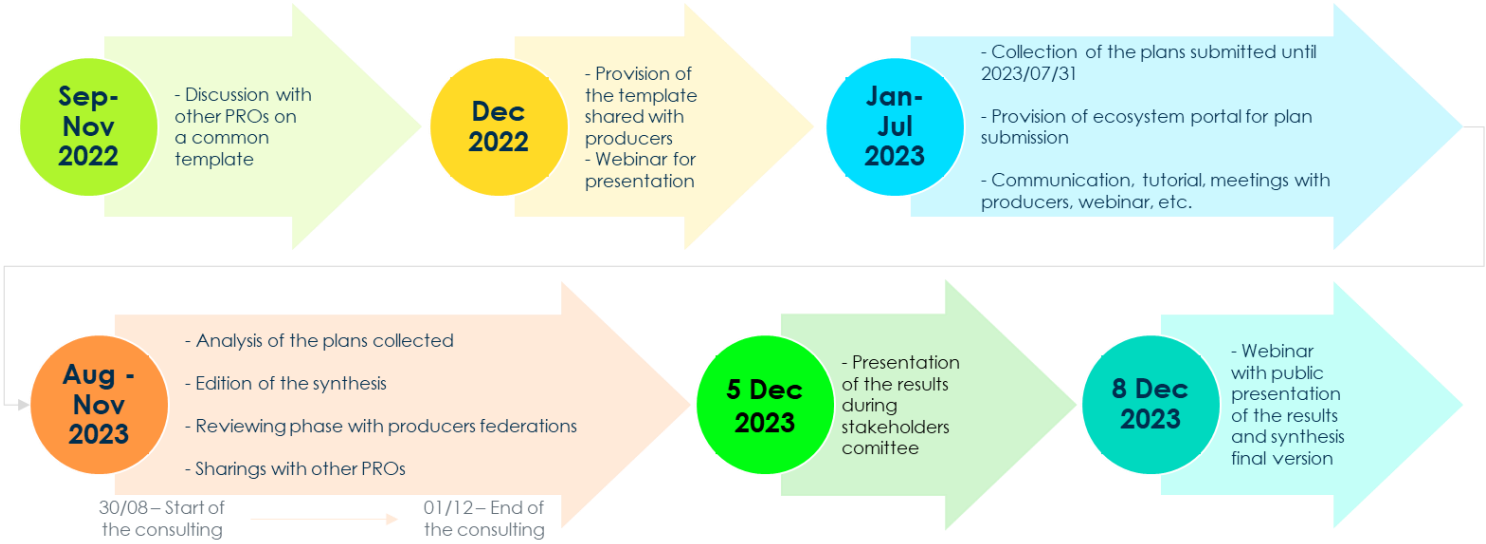
They must produce a plan defining the prevention and ecodesign objectives and actions to be implemented over the next five years. This plan can be drawn up individually or collectively by producers and must be revised every five years, incorporating a review of the previous plan.

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 Household EEE sector to waste prevention and ecodesign.

# 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) 99% 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, 67% 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 80% 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<br>EN | 795 views<br>182 views |
| Public webinar | FR | 151 live participants<br>1,500 replays |
| Trade association webinars | FR | AFIMIN - 8 participants<br>CIFL - 7 participants<br>INOHA - 30 participants |
| Web page | FR<br>EN | 7,644 times<br>203 times |
| Mail and telephone hotline | FR & EN | 419 responses from the **ecosystem** ecodesign team (80% of requests received by the ecodesign team)<br>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 Household sector | Manufacturer | 461 |
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| Number of joint plans received from the Household sector | Total Household | 0 |

For information, between 1st September 2023 and 15th November 2023, **ecosystem** received 79 additional plans for the Household 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.

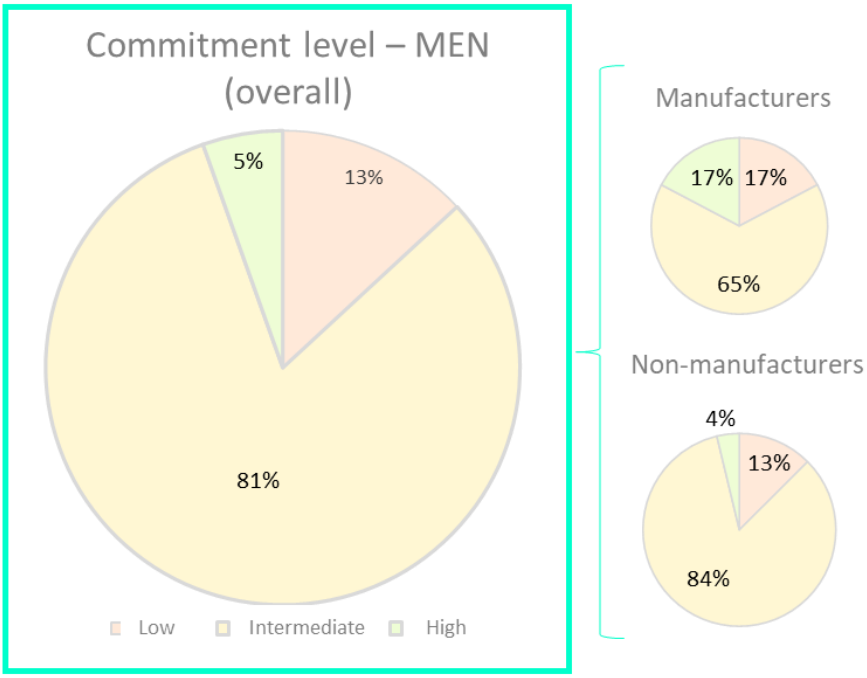
**ecosystem** also received 304 identical plans, transmitted by an agent managing the administrative side of EPR obligations for these 304 producers, and a few other identical plans for legal entities belonging to the same group. However, the plans received could not be considered as fully-fledged joint plans, insofar as no indication was provided to **ecosystem** of the process of combining very distinct producers in a co-construction approach. For the remainder of the analysis, we decided to separate these plans on an accounting basis, in order to assess the level of engagement in the plans submitted.

## 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 Household 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.

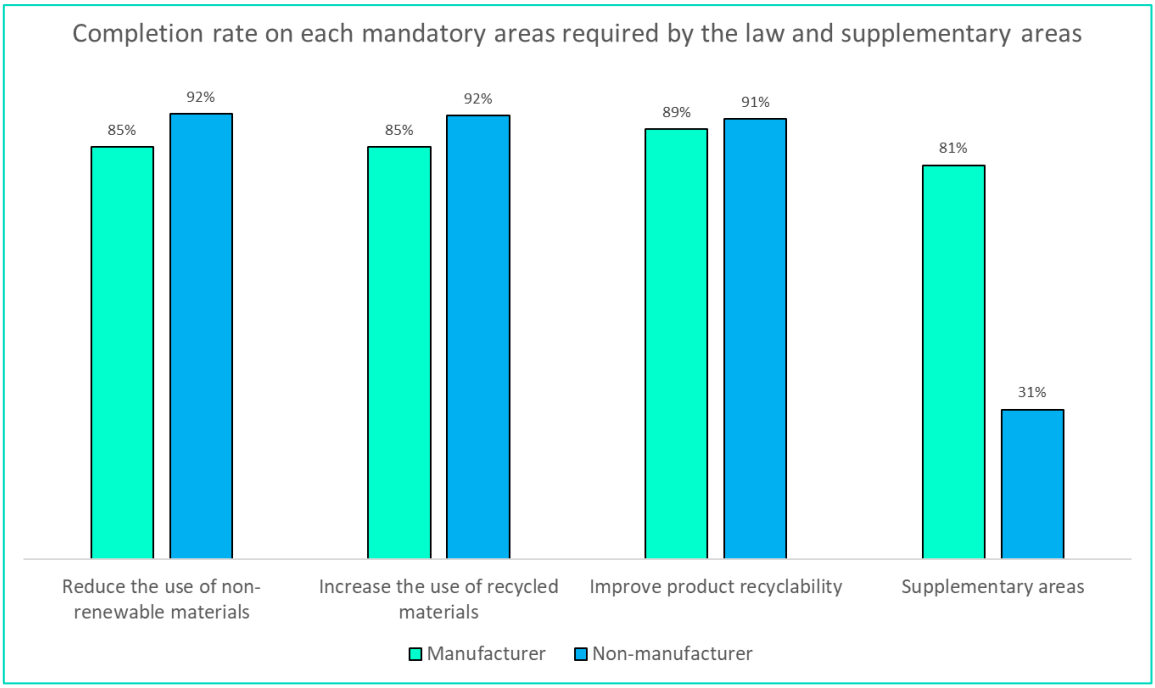



Most of the plans received are at intermediate level, which indicates that all **ecosystem** producers in the Household sector are well on the way to meeting the three regulatory targets. Furthermore, most of them have also positioned themselves in supplementary areas, which testifies to the willingness 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 high-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.*

Manufacturers were almost equally engaged in the areas addressed by the regulations and in supplementary areas, while non-manufacturers concentrated mainly on the areas covered by the regulations. It should be noted that the 304 identical plans received by **ecosystem** mentioned above do indeed impact the rate results for non-manufacturers. This has contributed to a slightly higher rate for manufacturer producers, and a correspondingly lower level of engagement to 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:*

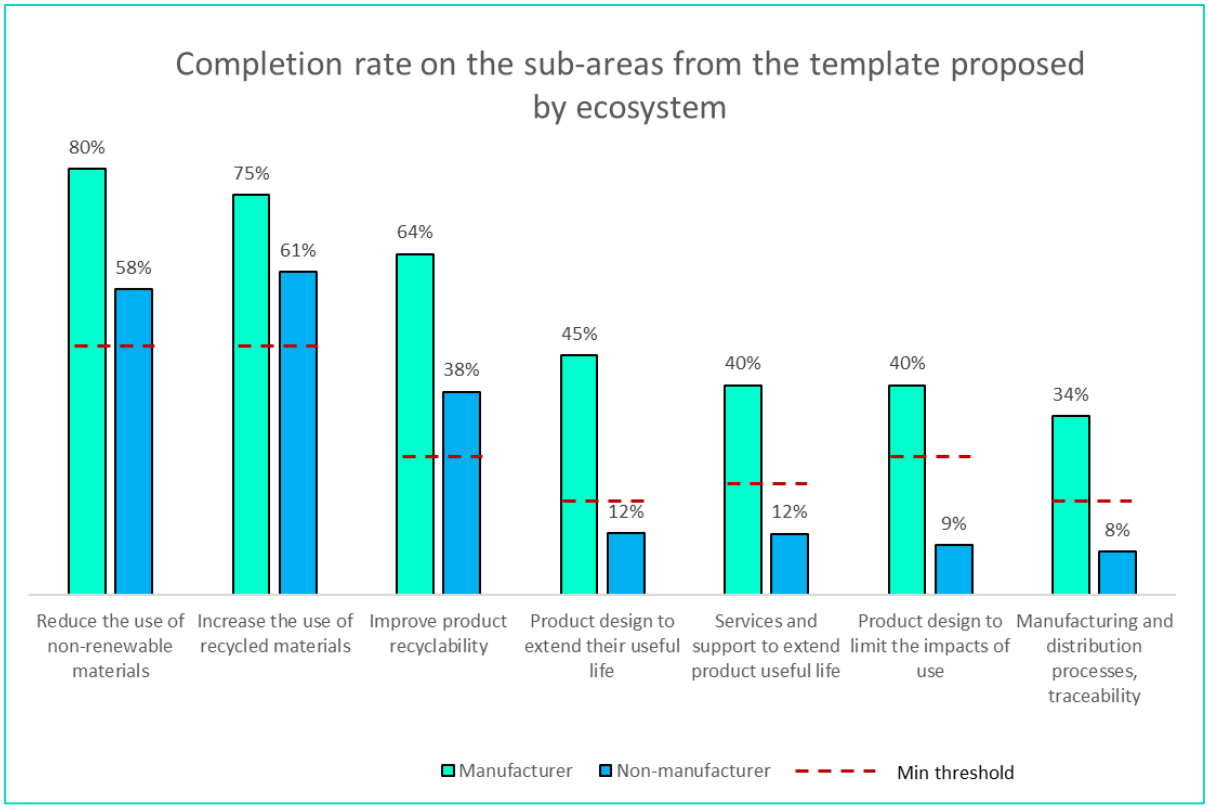
- *Sub-area 1: Maximise the use of recycled materials*
- *Sub-area 2: Identify suppliers, create partnerships*

*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:

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

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". On this last point, a difference has been noted between producers with large volumes of products put on the market, who will be subject to the indication of recyclability, pursuant to decree No. 2022-748 of the AGEC anti-waste law, and those who are not (lower sales and/or volumes of products brought to market).

Secondly, it was found that manufacturer producers have a higher level of engagement than non-manufacturers in the sub-areas of the supplementary areas, and above the minimum threshold for each of them. Once again, it should be noted that indicators for non-manufacturers are also affected by the 304 identical plans in which no action is described for

supplementary areas. However, the lack of levers identified among non-manufacturers may also explain the low rate of engagement in all sub-areas of the supplementary areas.

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 classes:

- 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

| Mandatory area | Major trends in waste prevention and ecodesign taken from plans submitted by ecosystem producer members |
|---|---|
| **Reduction in the use of non-renewable materials** | Identification and evaluation of product constituent materials |
| | Reduction in the quantity of plastics used |
| | Substitution with renewable materials (natural or biosourced) |
| | Working with suppliers: awareness, evaluation, incentives |
| | Optimisation of dimensional characteristics: weight, volume, etc. |
| | Sustainable purchasing processes and optimised procurement |
| | Rationalisation of the diversity of materials and components used |
| | Reuse of components and standardisation across multiple products |
| | Rationalisation of products, ranges and variants |
| | Reduction of non-renewable materials in packaging |

In general, manufacturers have engaged in relevant actions with the overall aim of reducing the use of non-renewable materials, whether in terms of product evaluation - by the manufacturer itself or through its suppliers - with a view to defining improvement targets, or in terms of design and development with targets (rarely quantified) for optimising the dimensional characteristics of parts and products, or by rationalising the materials and components used. Another recurring trend among producers, this time less pertinent to the area for the EEE sector, has been to commit to reducing the use of non-renewable materials in the packaging sector.

The main difficulty with this mandatory area for the EEE sector is that the alternative to the use of non-renewable materials can be understood as the promotion of renewable materials, such as natural materials (such as wood or plant fibres in plastics), or biosourced materials (e.g. biosourced plastics). 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.

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 consumers 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

| Mandatory area | Major trends in waste prevention and ecodesign taken from plans submitted by ecosystem producer members |
|---|---|
| **Increased use of recycled materials** | Integration of recycled materials, higher incorporation rate |
| | Identification and assessment of recycled materials integrated and to be integrated |
| | Working with suppliers: awareness, evaluation, incentives |
| | Incorporation of recycled metals (steel, aluminium) |
| | Short-loop recycling/internal to the producer |
| | Identification of suppliers of recycled materials and partnerships with them |
| | Maximisation of the use of recycled materials in packaging |
| | Development of partnerships with recyclers and Producer Responsibility Organisations |
| | R&D projects and innovation for the integration of recycled materials |
| | Reuse of components in the manufacture of products |

In general, producers have committed to appropriate actions aimed at increasing the proportion of recycled materials in equipment placed on the market.

These actions have often been defined according to the challenge of maximising the use of recycled materials, mainly plastics and metals (aluminium, steel), through sometimes quantified and very heterogeneous targets for minimum rates to be achieved on product ranges (e.g. 30% minimum recycled plastic content on a specific range).

Other actions were based on the challenges of working with suppliers. Among the latter, a distinction is made between suppliers who offer recycled materials downstream in the chain (e.g. recyclers), leading to the creation of new partnerships, and suppliers upstream in the chain who supply manufacturers 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 also 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 Household sector is also supported by the AGEC law, which requires the largest manufacturers to display information on the percentage of recycled materials in the equipment they put on the market. This encourages producers to position themselves on this criterion. However, the calculation methodology is not often explained, despite a few references to the use of European standard EN 45557, which differentiates between pre-consumer and post-consumer recycled material.

In addition, short-loop recycling, often internal, with the use of regrind plastic from production waste, for example, was repeatedly mentioned. In the view of **ecosystem**, this interesting initiative could be supplemented by targets for the integration of post-consumer recycled materials, in line with the circularity of EEE. These additional targets would also give producers access to the criteria for adjusting eco-contributions for EEE.

Other recurring actions include the packaging scope and actions to reuse components by producers, in short or long loops. These actions are not associated with the concept of integrating recycled materials into EEE and are outside the scope of this 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 and on 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** |
|---|
| Assessment of the recyclability of existing products for improvement |
| Working with suppliers: awareness, evaluation, incentives |
| Consideration of component separability in design |
| Rationalisation and pooling of materials (plastics) and components |
| Compliance with REACH and RoHS requirements |
| Assessment and tracking of recycling substances and disruptors |
| Reduction or elimination of certain substances (solvents, BFRs, etc.) |
| Development and selection of single-material products |
| Easy access to electronic components (batteries, boards, cells) |
| Choice of recyclable packaging |

In general, 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 an initial assessment of the recyclability rate
- 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 widely 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.

It is worth noting that the challenges of extracting electronic components and reducing irreversible assembly bonds (e.g. glued, welded, crimped) have been relatively well integrated by manufacturers, who are seeking to improve product design or raise awareness of this issue among their suppliers.

Most of the actions undertaken by producers were shared by both manufacturers and non-manufacturers. Even if, once again, the distinction between non-manufacturers, namely those who do 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.

The Household sector is also affected by the AGEC law, which requires the largest marketers to display a recyclability statement ("mostly recyclable" or no statement at all). This may encourage producers to position themselves on these questions. Some manufacturers choose to go one step further and calculate not just a label but a more precise recyclability rate, in line with their ecodesign approach. In this case, the calculation methodology is not often explained, despite a few references to the use of the REEECYC'LAB tool developed by **ecosystem**.

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.

Actions aimed at reducing irreversible bonds in products and using a lesser diversity of materials (e.g. a maximum of three different plastics) and components, or even single-material products to encourage recycling, were mentioned on numerous occasions. Many have committed to rationalising their product ranges.

Packaging was mentioned multiple times in the actions undertaken. The associated actions are outside the scope of WEEE management for the area concerned, in the same way as actions involving internal recycling, the use of recycled materials or the reuse of components, as these actions are not related to the concept of recyclability.

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
- Raise producer awareness of the out-of-scope nature of EEE packaging.
- Support producers in ecodesign to assess and improve product recyclability, define realistic, quantified targets.

## 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 repair or reuse, and by offering associated services to ensure that they last longer. Although the repairability index regulations only apply to nine product categories, some producers have stated their ambition to use them as a basis for a systemic approach to product evaluation.

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 consumers towards more sustainable choices. This is often based on the energy performance of equipment.

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 mandatory and 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 in Appendix 1 and Appendix 2, again with a distinction between manufacturer and non-manufacturer 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**.

With regard to the use of non-renewable resources, the integration of recycled materials and recyclability, certain producers are also subject to obligations concerning the display of the environmental qualities and characteristics of their products (Decree No. 2022-748). Depending on the regulations with which they are confronted, or their level of maturity in ecodesign**, producers may be 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).

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 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 household 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 areas expected by the law could lead to 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 Household 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:** Professional equipment is by its very nature 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 households 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)

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# 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 | Identify the non-renewable materials used in the products: development of tools and procedures to assess and track the quantity and type of non-renewable materials used per product. | | 1 | Identification and reduction of the quantity of non-renewable materials used in products and components: collection of product composition details (focus on metals, especially critical resources, and plastic materials) | |
| 2 | Cooperation with suppliers to assess the composition of non-renewable materials in products to then identify alternatives / substitutions with lower-impact materials | | 2 | Awareness, questioning and scoring of suppliers for product composition: deployment of assessment tool / system for supplier selection | |
| 3 | Reduction in the quantity of non-renewable materials in product conditioning: focus on packaging with an ecodesign approach on the choice of materials and quantity used | | 3 | *Sourcing* of renewable materials; biosourced (wood, plant fibre plastics, etc.) to replace non-renewable materials | |
| 4 | Reduction in the quantity of plastics in products | | 4 | Ecodesign approach and choice of materials with low environmental impact in a life cycle assessment approach: prioritise recycled and recyclable materials, bioplastics are also mentioned alongside certified materials | |
| 5 | Product ecodesign with the aim of identifying reductions in non-renewable materials upstream: optimisation of dimensional properties / weight of products developed. The Life Cycle Assessment (LCA) approach is mentioned several times | | 5 | Reduction in the use of plastic materials: objectives vary depending on the producer, in terms of packaging and products. Replacement with biodegradable, biosourced plastic or material that is more easily recycled. | |
| 6 | Replacement of non-renewable materials with natural, biosourced materials. e.g. bioplastics | | 6 | Use of recycled or recyclable materials: integration in product design phases. | |

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| 7 | Stakeholder awareness and training on the concept of non-renewable materials with a view to their reduction in the development and marketing | | 7 | Employee training and awareness on reducing the use of non-renewable materials | |
| 8 | Increased recycled material content in products to reduce the portion of non-renewable materials | | 8 | Reduction in the quantity of non-renewable packaging used, in particular the reduction and even elimination of plastics such as PSE | |
| 9 | Development of a sustainable purchasing policy to better assess and select suppliers, prioritise the selection of lower-impact products and materials | | 9 | Optimisation of product design: mass/volume ratio, product sizes | |
| 10 | Product ecodesign integrating end-of-life processing requirements | | 10 | Reduction in the number of components using mostly non-renewable resources in products developed, notable printed circuit boards. | |

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

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Identification and reduction in the number of different materials and components used in products: Evaluation and requalification of materials and components to be used | | 1 | Regulation and optimisation of purchasing according to actual needs, to reduce the quantity of materials and components used and cut waste. The first step is to identify the types of materials used in products, then optimise them according to requirements | |
| 2 | Optimisation of product design: dimensional characteristics (size, thickness, part weight) | | 2 | Systematic optimisation and rationalisation of material and component quantities in the development of new products | |
| 3 | Raising awareness and working with suppliers to reduce the quantity of materials and components used | | 3 | Reduction in the number of materials and components used, in particular the diversity of plastics used and optimisation of the number of components in products | |
| 4 | Pooling materials and components on different products | | 4 | Promotion of resource conservation right from the design phase. Ecodesign approach using recyclable and eco-responsible materials to replace non-renewable ones. Re-examination of needs and decision to eliminate certain types of products or parts | |
| 5 | Design process integrating the objective of reducing the number of components in products. | | 5 | Reduction in product size and weight while maintaining performance: optimised product design | |
| 6 | Improvement of the purchasing and procurement process: optimised product inventories and supplier orders | | 6 | Pooling of materials and standardisation of materials for different product ranges; identification of components and materials that can be used on several products and therefore be standardised | |

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| 7 | Internal recycling/reuse of components and materials: reuse of production scrap and offcuts | | 7 | Reuse and reconditioning of existing products, re-injection into manufacturing processes of components and materials already used: implementation of a process to recover sources of reusable components and materials | |
| 8 | Optimisation of packaging: reduce the quantity used and cut down on the use of plastics | | 8 | Rationalisation of materials and quantities used in packaging: elimination of plastic and optimisation of packaging size | |
| 9 | Rationalisation of product ranges and variants | | 9 | Raising awareness and working closely with suppliers to collect product information and optimise the quantities and diversity of materials used: incorporate new criteria into specifications. | |
| 10 | Promotion of ecodesign and the circular economy: using life-cycle analysis | | 10 | Selection of suppliers and decision to relocate production for better traceability and reduced impact | |

## SUB-AREA: OTHER AVENUES IDENTIFIED BY PRODUCERS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Identification and reduction in the number of different materials and components used in products: Evaluation and requalification of materials and components to be used | | 1 | Regulation and optimisation of purchasing according to actual needs, to reduce the quantity of materials and components used and cut waste. The first step is to identify the types of materials used in products, then optimise them according to requirements | |
| 2 | Optimisation of product design: dimensional characteristics (size, thickness, part weight) | | 2 | Systematic optimisation and rationalisation of material and component quantities in the development of new products | |
| 3 | Raising awareness and working with suppliers to reduce the quantity of materials and components used | | 3 | Reduction in the number of materials and components used, in particular the diversity of plastics used and optimisation of the number of components in products | |
| 4 | Pooling materials and components on different products | | 4 | Promotion of resource conservation right from the design phase. Ecodesign approach using recyclable and eco-responsible materials to replace non-renewable ones. Re-examination of needs and decision to eliminate certain types of products or parts | |
| 5 | Design process integrating the objective of reducing the number of components in products. | | 5 | Reduction in product size and weight while maintaining performance: optimised product design | |
| 6 | Improvement of the purchasing and procurement process: optimised product inventories and supplier orders | | 6 | Pooling of materials and standardisation of materials for different product ranges; identification of components and materials that can be used on several products and therefore be standardised | |
| 7 | Internal recycling/reuse of components and materials: reuse of production scrap and offcuts | | 7 | Reuse and reconditioning of existing products, re-injection into manufacturing processes of components and materials already used: implementation of a process to recover sources of reusable components and materials | |
| 8 | Optimisation of packaging: reduce the quantity used and cut down on the use of plastics | | 8 | Rationalisation of materials and quantities used in packaging: elimination of plastic and optimisation of packaging size | |

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| 9 | Rationalisation of product ranges and variants | | 9 | Raising awareness and working closely with suppliers to collect product information and optimise the quantities and diversity of materials used: incorporate new criteria into specifications. | |
| 10 | Promotion of ecodesign and the circular economy: using life-cycle analysis | | 10 | Selection of suppliers and decision to relocate production for better traceability and reduced impact | |

## Increased use of recycled materials

### SUB-AREA: MAXIMISE THE USE OF RECYCLED MATERIALS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Integration of recycled plastics in products: minimum content target set by certain producers | | 1 | Definition of specific quantity-related targets to increase the proportion of recycled materials in products: a reflection phase for certain producers with a diversity of indicators depending on the type of recycled material concerned (mainly plastics, steel and aluminium) | |
| 2 | Assessment of current levels of recycled content in products and definition of targets | | 2 | Raising awareness, collaborating and encouraging suppliers to use recycled materials in their products: requirements in specifications | |
| 3 | Raising awareness, collaborating and encouraging suppliers to incorporate more recycled materials in their products: inclusion of criteria in specifications and preference to suppliers who incorporate recycled materials | | 3 | *Identification and measurement of the proportion of recycled materials: gather information from suppliers, analyse the existing situation and implement an identification and monitoring tool/process* | |
| 4 | Identification of recycled materials that can be incorporated into products and components/parts, based in particular on standards | | 4 | Identification of products and components that can be designed and produced from recycled materials. | |
| 5 | Incorporation of recycled material in packaging and leaflets | | 5 | Integration of recycled plastics on certain parts or products with certain target rates | |
| 6 | Maximisation of the use of recycled materials in products such as metals (mainly steel and aluminium) and glass/ceramic materials | | 6 | Ecodesign promoting the incorporation of recycled materials in specific products and product ranges, by raising awareness among design teams and launching specific ranges | |
| 7 | Short-loop/in-house recycling by the manufacturer producer | | 7 | Sourcing strategy: identification of channels, identification and selection of suppliers of recycled materials or products using a maximum of recycled materials | |
| 8 | Design and development of products/ranges using as many recycled materials as possible, including innovative solutions. | | 8 | Use of recycled aluminium and steel in product manufacturing | |
| 9 | Reuse of components in products. | | 9 | Optimisation of packaging to include more recycled materials | |

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| 10 | | | 10 | Short-loop reuse of recycled components or materials in the manufacture of new products | |

## SUB-AREA: IDENTIFY SUPPLIERS AND CREATE PARTNERSHIPS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Identification and qualification of suppliers (by product category for example): consultation of new suppliers favouring the use of recycled materials. | | 1 | Partnerships with suppliers of recycled materials (intermediate suppliers and recycling companies in particular): identification of potential suppliers of recycled materials and development of collaboration with players close to production sites. | |
| 2 | Improved (sustainable) purchasing/sourcing strategy: review of specifications/supplier evaluation and compliance with charters and new criteria established on the concept of integrating recycled materials | | 2 | Identification and selection of suppliers using recycled materials: requirement in the specifications of purchasing teams with minimum recycled material content levels applicable to product categories | |
| 3 | Awareness-raising and incentives for existing suppliers: assessment to define objectives | | 3 | Evaluation of suppliers and creation of ratings based on criteria such as the use of recycled materials: systematic rating approach to encourage the choice of environmentally-engaged suppliers (eco-responsible, labelled or certified suppliers) | |
| 4 | Selection of suppliers of recycled plastics. | | 4 | Traceability throughout the supply chain and relocation to ensure the reliable origin of materials, especially recycled materials. | |
| 5 | Collaboration with end-of-life players (recyclers, suppliers of recycled materials, Producer Responsibility Organisations) | | 5 | Choice of suppliers committed to the use of recycled plastics. | |
| 6 | Partnerships with local suppliers | | 6 | Supplier awareness, education and collaboration: supplier questionnaire on their ecodesign strategy and environmental commitment, with a focus on the use of recycled materials. | |
| 7 | Choice of suppliers for the packaging scope | | 7 | Commitment to certification or labelling of recycled materials used: partnerships with organisations to obtain environmental labels | |
| 8 | Identification of recycled materials and reusable components applicable to products placed on the market. | | 8 | Partnerships with Producer Responsibility Organisations and sorting and recycling facilities, particularly with regard to the quality of recycled plastics | |
| 9 | Participation in projects promoting the integration of recycled materials in products: pilot project for the development of usable recycled materials | | 9 | Reduction in non-recyclable materials in products through supplier selection | |
| 10 | Traceability of materials and certification, based in particular on more local production | | 10 | Use of recycled materials and choice of suppliers in the packaging sector | |

## TRENDS IN OTHER AVENUES IDENTIFIED BY PRODUCERS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Establish a methodology for calculating and recording recycled content levels in products | | 1 | Inform and raise awareness among suppliers, internal teams and vendor customers about the integration of recycled materials and the sourcing of secondary materials | |
| 2 | Design new parts to incorporate recycled materials without compromising reliability | | 2 | Creation of ratings and eco-scores (eco-selection) incorporating recycled material content. | |
| 3 | Create incentives or rewards for manufacturer producers who meet or exceed recycled material targets | | 3 | Recycling of production waste for reintegration into the production cycle. | |
| 4 | Examine the use of recycled materials in products | | 4 | Responsible purchasing strategy with emphasis on the use of recycled materials. | |
| 5 | Train teams in sustainable sourcing/secondary market | | 5 | Ecodesign and R&D pilot project to integrate recycled materials and reuse end-of-life components. | |
| 6 | Training in electronics activities with a focus on the circular economy | | 6 | Track the availability of recycled materials for incorporation into products, particularly future products | |
| 7 | Return of old products | | 7 | | |
| 8 | Integrate recycled plastic on parts that are not aesthetically pleasing | | 8 | | |
| 9 | Design with upcycling in mind | | 9 | | |

## Improved product recyclability

### SUB-AREA: CHOOSE RECYCLABLE MATERIALS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Research and choice of recyclable materials or components in products, through better knowledge of materials, substances and disruptors to be avoided. | | 1 | Use of recyclable materials whenever possible in products (mainly metals and plastics) | |
| 2 | Identification and assessment of product recyclability: calculation of recyclability rate and target for achieving or maintaining a high rate | | 2 | Collection of information on product recyclability with a view to increasing recyclable content: ask suppliers about the composition of their products | |
| 3 | Substitution/replacement of inferior or non-recyclable materials with recyclable materials: tangible technical choices for plastics and metals. | | 3 | Identification of potentially recyclable materials in products: provide a tool to identify recyclable materials and work with development teams and suppliers. | |
| 4 | Integration of recyclability criteria in product design: the concept of separability of parts and choice of materials, and compliance with regulations on recyclability | | 4 | Inclusion of the recyclability target in supplier specifications: involvement of purchasing teams and selection of suppliers based on recyclability rate | |
| 5 | Use of recycled materials or re-used components in product design and manufacture | | 5 | Measurement and increase of the proportion of products made from recyclable materials: ask suppliers about the composition of their products to analyse current products and assess their recyclability, and then determine the applicable actions. | |
| 6 | Selection of recyclable packaging or recyclable materials in the product packaging | | 6 | Environmental design with material selection criteria including recyclability. | |
| 7 | Integration of recyclability requirements in supplier specifications. | | 7 | Improvement in supplier awareness, relationships and collaboration on the concept of recyclability, encourage the use of recyclable materials | |
| 8 | Qualification and evaluation of suppliers to promote those offering more recyclable products/components | | 8 | Reduction in the use of plastics or non-recyclable plastics: substitution by other recyclable materials, including recyclable plastics | |
| 9 | Substitution with biosourced materials | | 9 | Development of recyclable product ranges or articles: replace non-recyclable articles with recyclable ones (eco-selection of predominantly recyclable products) | |
| 10 | Development of single-material products and rationalisation of the number of parts in products | | 10 | Improved packaging | |

## SUB-SECTOR TRENDS: ENSURE PARTS ARE SEPARABLE

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Integration of concepts of ease of dismantling, separability of parts and components in the design process. Design reviews will be carried out with these requirements in mind. | | 1 | Component separability to increase product recyclability and repairability: development and selection of products/suppliers integrating this requirement, sometimes quantified in specifications | |
| 2 | Preference for reversible mechanical connections (clips, screws) rather than irreversible bonds such as adhesive bonding, which should be avoided | | 2 | Preference for reversible mechanical connections (clips, screws) rather than irreversible bonds to be avoided/reduced, such as adhesive bonding or welding | |
| 3 | Maintaining the separability of parts and their potential recyclability: ensuring that products are developed for easy disassembly | | 3 | Working with suppliers to improve part separability: raising awareness and providing incentives through new requirements in specifications | |
| 4 | Easier disassembly and access to components to be removed and replaced, especially electronics, batteries and cells | | 4 | Strategic ecodesign of products for end-of-life, anticipating easy dismantling to facilitate recycling | |
| 5 | Identification of replaceable parts to assess their potential separability and recyclability: use of REEECYC'LAB (**ecosystem** tool) | | 5 | Easier extraction of electrical and electronic components used in product design and development, such as boards, batteries and cells. | |
| 6 | Ecodesign approach and programme, with the development of rules for better development of separable and recyclable products. Raising awareness | | 6 | Accessibility and use of standard spare parts to make it easy to repair and replace faulty components. Choice of suppliers | |
| 7 | The notion of modularity is integrated in product design and development: sub-assemblies can be replaced, interchangeability goes hand in hand with a reduction in the number of components | | 7 | Training and awareness-raising for designers: Designers are trained to emphasise component separability when developing new projects. | |
| 8 | Integrate the concept of component separability into supplier specifications: promote suppliers who better respect product separability constraints | | 8 | Documentation and transparency: detailed information on product disassembly and availability of spare parts, with particular attention to providing assembly/disassembly instructions. | |
| 9 | Information, awareness-raising and training for teams, including suppliers, on equipment separability and recyclability | | 9 | Integration of modularity criteria into product development | |
| 10 | Facilitation of equipment repairability | | 10 | Promotion of single-material products: It is preferable to favour products made from a single material or to improve the separability of materials to facilitate recycling | |

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

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Compliance with REACH and RoHS regulatory requirements | | 1 | Compliance with RoHS and REACH environmental standards | |
| 2 | Definition, identification and monitoring of substances and recycling disruptors in products | | 2 | Identification for reduction or even elimination of substances that interfere with sorting and recycling: inventory based on | |

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| | | | | knowledge of products and their composition in terms of materials and substances, with a view to their substitution | |
| 3 | Awareness-raising and collaboration with suppliers: evaluation and follow-up (also linked to regulatory compliance) | | 3 | *Raising awareness and working with suppliers to identify and reduce the use of substances that are both regulated and disruptive to recycling: requirements in specifications and monitoring.* | |
| 4 | Integration of substances and recycling disruptors in product design and supplier specifications | | 4 | Orientation of sourcing and marketing policy towards products which comply with environmental requirements and those with improved recyclability | |
| 5 | Action plan and solutions for the substitution/elimination of certain substances used in products | | 5 | Development of products with an ecodesign approach integrating the notion of recyclability: inclusion of criterion on recycling disruptors | |
| 6 | Reduction/elimination of hazardous substances or recycling disruptors such as solvents, paint, BFRs (in plastics), additives, surface treatment, etc. | | 6 | Improved component separability to facilitate disassembly, sorting and recycling operations: reduction in irreversible bonds in products (integrated into specifications) | |
| 7 | Promotion of single-material products and reduction/elimination of adhesive bonding processes, bi-material injection, metal inserts, etc. | | 7 | Training and awareness-raising on the concept of recyclability for employees, particularly designers | |
| 8 | Reduced use of packaging or protection for certain parts/components that can interfere with recycling | | 8 | Distribution of single-material products | |
| 9 | Promotion of modular products for easy disassembly and replacement of electronic components | | 9 | Improved recyclability of packaging and elimination of certain disruptive materials | |

## SUB-AREA: RATIONALISE THE DIVERSITY OF MATERIALS AND COMPONENTS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Reduction in the number of materials used | | 1 | Standardisation of materials and components to reduce diversity and simplify the supply chain. | |
| 2 | Reduction in the number of components used. | | 2 | Rationalisation and reduction in the number of different materials and components used in products: pooling of components between ranges | |
| 3 | Integration of a reduction in the diversity and quantity of materials and components in ecodesign criteria | | 3 | Data collection to measure the diversity of materials and components used, with a view to building rationalisation indicators: determination of data to collect and development of steering indicators. | |
| 4 | Reduction in the diversity of plastics and selection of certified materials | | 4 | Procurement and sourcing policy with a preference for suppliers offering products with a lower diversity of materials and/or components | |
| 5 | Harmonisation of BOM and standardisation of materials and components | | 5 | Collaboration with suppliers to offer products with the least possible diversity of materials and components | |
| 6 | Rationalisation of the number of suppliers and promotion of local players | | 6 | Use of natural or biosourced materials: development of partnerships with suppliers of more sustainable materials | |
| 7 | Rationalisation of product ranges and variants | | 7 | Recyclability awareness and training: raising awareness of recyclability among designers and suppliers | |
| 8 | Reuse of components and materials in products (internal materials recycling) | | 8 | Simpler product design, integrating the rationalisation of materials and components and the standardisation aspect | |
| 9 | Evaluation, measurement and monitoring of the quantity and diversity of materials and components used (including supplier monitoring) | | 9 | Rationalisation of packaging: eliminate plastic and encourage suppliers to use recycled and recyclable single-material packaging | |
| 10 | Development of tools to optimise the design and development of products with the least possible diversity of materials and components | | 10 | Collaboration with Producer Responsibility Organisations and recyclers to integrate recyclability and developments to improve product design and development | |

## TRENDS IN OTHER AVENUES IDENTIFIED BY PRODUCERS

| Priority | MANUFACTURER | Class | Priority | NON-MANUFACTURER | Class |
|---|---|---|---|---|---|
| 1 | Promotion of the reuse of end-of-life products. Consumer awareness | | 1 | Evaluation of product recyclability: identification of products that can be recycled in the majority of cases, creation of monitoring systems and indicators | |
| 2 | Development of purchasing strategy with priority given to sourcing products from France | | 2 | Training and awareness-raising for employees and teams in development, purchasing, quality and marketing covering the concept of recyclability | |
| 3 | Definition of a recyclability rate to be achieved by suppliers Discussion and collaboration | | 3 | Communication on recyclability to stakeholders: transparency through environmental labelling (e.g. QCE data sheets) | |
| 4 | Calculation and assessment of product recyclability with a view to improvement | | 4 | Awareness-raising and incentives for suppliers through eco-selection of products, purchasing policy: eco-score for products and incentives for suppliers | |
| 5 | Reduction in the number of products manufactured through smaller production runs | | 5 | Improved product repairability, in particular through the repairability index | |
| 6 | Product design and development based on a life cycle analysis approach | | 6 | Recycling, reuse and reutilisation of products by the producer: implementation of a return process within the company for re-injection into its production process | |
| 7 | Communication and awareness-raising on product recyclability in accordance with the AGEC anti-waste law | | 7 | Investigation of implementation of circular solutions: investigations and support for methodological guidelines | |

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

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| | plans<br>- Design choices to improve robustness<br>- Extension of the warranty life of equipment<br>- Evaluation and improvement of service life with quantified targets (e.g. minimum of 10 years) | | against obsolescence)<br>- Reconditioning of products and second-hand sales<br>- Selection of suppliers and collaboration to propose scalable and robust products<br>- Product development with the possibility of integrating the latest parts and components<br>- Repairability index with spare parts availability |
| 4 | **Standardise materials, parts and components:**<br>- Reduction in the number of materials and components used<br>- Standardisation of parts and components, pooling and reuse across several ranges<br>- Development of simple/streamlined designs<br>- ecodesign approach with integration of modularity | 4 | **Design for multiple uses and users facilitate a second life:**<br>- Partnership with SSE players<br>- Development of collection for reuse<br>- Design of repairable/reusable products with new parts. Multi-functionality<br>- Sharing economy via the economy of functionality<br>- Promotion of more durable and easily reusable products<br>- Increase in the proportion of second-hand products sold |
| 5 | **Prioritise timeless aesthetics and styles:**<br>- Choice of neutral colours and styles (black, white, classic shapes)<br>- Choice of robust design as a priority over aesthetics<br>- Maintain sales of a product over the long term (e.g. 15 years)<br>- Spare parts warranty to keep the product range running longer | 5 | **Standardise materials, parts and components:**<br>- Standardisation of parts and components, pooling and reuse across several ranges<br>- Reduction in the number of material and component part references and ranges<br>- Influence with suppliers<br>- Integration of repairability and extended service life criteria |
| 6 | **Design for multiple uses and users facilitate a second life:**<br>- Choice of modular design and provision of standard parts and sub-assemblies<br>- Introduction of tutorials for disassembly and reconditioning<br>- Multifunctional products<br>- Development of second-hand product sales | 6 | **Prioritise timeless aesthetics and styles:**<br>- Designs to suit many styles (no branding, clean design)<br>- Choice of durable, timeless colours and materials (white, black, steel)<br>- Selection of suppliers offering timeless, durable product ranges.<br>- Integration of criteria in specifications<br>- Rationalisation of product ranges |

## Services and support to extend useful life

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

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| 5 | **Promote the sale of usage rather than products, and the sharing economy:**<br>- Produce lease and rental packages<br>- Provision of equipment for collective use<br>- Consideration of new business models | 5 | **Promote the sale of usage rather than products, and the sharing economy:**<br>- Product lease offers (long-term often evoked)<br>- Promotion of product utility and maximisation of usage through awareness-raising<br>- 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:**<br>- Use of an energy efficiency score for equipment<br>- Improved energy efficiency incorporated in product design<br>- Promotion of the most efficient equipment<br>- Solutions for consumption tracking and optimisation during use (connected appliances)<br>- Customer guidance on usage | 1 | **Limit consumption (energy, water, consumables, etc.) during use:**<br>- Eco-selection of resource-efficient products<br>- Consideration of ways to optimise product energy consumption<br>- Product energy optimisation work with suppliers<br>- Measurement systems incorporated into products.<br>- Technical solutions for energy efficiency (standby optimisation) |
| 2 | **Facilitate eco-friendly actions (energy consumption, waste management, good product maintenance) by users:**<br>- Provision of information and guidance on proper product maintenance<br>- Automated system to optimise consumption (inputs, energy, etc.)<br>- Improved information leaflets<br>- 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:**<br>- Consumer education and awareness via guides and tutorial videos<br>- Automated system to optimise consumption (inputs, energy, etc.)<br>- Promotion of good practices at the end of equipment life (collection and recycling) |
| 3 | **Ensure ease of maintenance:**<br>- Provision of information and guides<br>- Development of digital solutions<br>- Communication on maintenance reminders (e.g. alarm systems)<br>- Capitalisation/feedback on breakdowns<br>- Consideration of maintenance needs in product design | 3 | **Ensure ease of maintenance:**<br>- Maintenance advice provided to the consumer<br>- Availability of spare parts<br>- Development of digital solutions (e.g. IoT)<br>- Extended warranties<br>- Consideration of maintenance needs in product development |
| 4 | **Reduce emissions and discharges during the product life cycle:**<br>- Consideration of energy performance criteria in product design<br>- Reduction in the use of fluids with high warming potential in refrigeration circuits (substitution with less warming fluids)<br>- Product evaluations (carbon footprint, LCA) | 4 | **Reduce emissions and discharges during the product life cycle:**<br>- Integration of energy performance criteria in product development and selection<br>- Product assessments (carbon footprint, LCA)<br>- Compliance with environmental standards such as REACH and RoHS<br>- Raise awareness about energy savings |

## Manufacturing and distribution processes, traceability

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

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| 4 | **Minimise waste and production volumes:**<br>- Reduction in scrap rates, optimisation of production<br>- Recovery of production offcuts<br>- Optimisation of production and stock volumes (also involving purchasing teams) | 4 | **Reduce consumption and emissions associated with manufacturing processes:**<br>- GHG emissions assessment and decarbonisation action plan<br>- Reduction in energy and water consumption on production sites<br>- Reduction in waste and optimisation of production<br>- Improved awareness and selection of suppliers according to these criteria |
| 5 | **Develop supply chain traceability and control:**<br>- Implementation and modernisation of monitoring tools<br>- Evaluation and monitoring of suppliers (focus on regulated substances, critical and strategic (and conflict-prone) mineral resources)<br>- Regulatory compliance<br>- Responsible purchasing policy | 5 | **Optimise product weight/volume ratio:**<br>- Optimisation of transport and storage<br>- Optimisation of products and packaging<br>- Optimisation of development (choice of material, weight/volume) |
| 6 | **Optimise product weight/volume ratio:**<br>- Optimisation of packaging<br>- Choice of lighter materials<br>- Optimisation of design in terms of part weight and volume | 6 | **Minimise waste and production volumes:**<br>- 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 |
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| **Reduce the use of non-renewable materials** (area referred to in the law) | - Optimisation of materials and manufacturing processes (World Class Manufacturing - WCM - type standards)<br>- Integration of biosourced materials (NF 16575) and biodegradable materials (NF EN 12432) | | | - ecodesign webinars<br>- Best practice sheets by **ecosystem** --> focus on "renewable" materials<br>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 | - Article 13 of the AGEC law: disclosure of the percentage of recycled materials<br>- Future developments in the ecodesign directives | - Bonus linked to criteria on the progressive integration of post-consumer recycled materials (under consultation) | - Ecodesign webinars<br>- Practical guide by **ecosystem** - integrating recycled plastic<br>- Summary on the environmental benefits of recycled plastics<br>- Support from **ecosystem** in the search for potential suppliers (plastics in particular)<br>- Examination of sustainable purchasing (delivery in 2024)<br>- Provision of LCI of recycled plastics<br>- Chaire Mines Urbaines projects and other projects under development<br>- email and telephone hotline |

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| **Increase product recyclability** (area referred to in the law) | - Standard EN 45555: evaluate the recyclability of a product | - Article 13 of the AGEC law: disclosure of recyclability information and the presence of hazardous substances<br>- Future developments in ecodesign directives<br>- WEEE Directive<br>- Product substance regulations (RoHS, REACH, POP)<br>- F-gas regulation | - Penalty on battery separability<br>- Penalty on the use of certain refrigerants<br>- Penalty on the presence of plastic parts with BFRs | - Ecodesign webinars<br>- AGEC method recyclability assessment method<br>- Best practice sheets by **ecosystem** -->Choice of materials and connections between parts/surface treatments<br>- Recycling diagram<br>- REEECYC'LAB<br>- Customised workshops<br>- Chaire Mines Urbaines projects<br>- email and phone hotline |
| **Product design to extend their useful life** (supplementary area not referred to in the law) | | - REEN law of 15/11/2021<br>- European regulation: universal USB-C charger from 2024<br>- AGEC law: durability index for certain products (French implementation and European harmonisation under discussion)<br>- AGEC law: repairability index for certain products<br>- European regulation: repairability index for phones and tablets | - Bonus or penalty depending on the value of the repairability index<br>- Bonus related to the availability of spare parts, technical documentation, disassembly with standard tools for printers<br>- Penalty on certain single-use products | - Ecodesign webinars<br>- Ecodesign guide for longer service life in preparation (delivery in 2024)<br>- Personalised workshops<br>- Chaire Mines Urbaines projects<br>- email and telephone hotline |
| **Services and support to extend product useful life** (supplementary area not referred to in the law) | | - AGEC law. Update supply periods<br>- Regulatory framework for software obsolescence<br>- Spare parts supply for >5 years (AGEC)<br>- Reuse fund (AGEC)<br>- Repair fund (AGEC) | - Bonus related to the provision of technical documentation | - Management of Reuse & Repair funds and the quali'Répar label<br>- Webinar on circular business models<br>- Chaire Mines Urbaines projects<br>- Referral to specialist consultants |
| **Product design to limit the impacts of use** (supplementary | - ISO 14025<br>- ISO 14040<br>- EN 15804<br>- EN 50693 | - Ecodesign directives<br>- ErP Directive | - Penalty on certain single-use products | - Webinar on circular business models<br>- LCI on end-of-life and on recycled plastics |

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| area not referred to in the law) | - PEP ecopassport® programme<br>- PEF (Product Environmental Footprint) | | | - Referral to specialist consultants |
| **Optimise product packaging** | - Integration of biosourced materials (NF 16575) and biodegradable materials NF EN 12432 | | | - Communication with approved Producer Responsibility Organisations in the packaging sector |
| **Manufacturing and distribution processes, traceability** (supplementary area not referred to in the law) | | | | - Ecodesign best practice sheets |

| **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<br>Circular economy certificate<br>EEEASY Programme |

**If you have any questions, please contact:**

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recycler c'est protéger