ecosystem
recycler c'est protéger

Summary of Ecodesign and Prevention Plans developed by ecosystem producer members

Lamp sector

5 December 2023

Version 1.0

Dashboard of indicators and key messages

Key indicator	Category	Result
Number of **ecosystem** producer members per type of producer in the Lamp sector	Manufacturer	62
	Non-manufacturer	717
	Total Lamp	779
Number of individual plans received per type of **ecosystem** producer member in the Lamp sector	Manufacturer	33
	Non-manufacturer	186
	Total Lamp	219
% of individual plans received in relation to the number of producer members in the Lamp sector	Total Lamp	28%
% of individual plans received in relation to the tonnage of lamps put on the market in the Lamp sector	Total Lamp	63%
Number of joint plans received from the Lamp sector	Total Lamp	0

Mandatory areas of the AGEC anti-waste law	Main trends in waste prevention and ecodesign in plans received from ecosystem producer members - Lamps
Reduction in the use of non-renewable materials	Identification and evaluation of product constituent materials
	Reduction in the quantity of materials used, especially plastics
	Working with suppliers: awareness, evaluation, incentives
	Life cycle analysis of lamps to identify and reduce non-renewable materials in these products
	Use of low-energy LEDs
	Rationalisation and miniaturisation of products, ranges and variants
	Reduction in non-renewable materials in packaging, in particular through bulk sales
Increased use of recycled materials	Integration of recycled materials, higher incorporation rate
	Identification and assessment of recycled materials integrated and to be integrated
	Collaboration with suppliers on awareness-raising, assessment, incentives to buy products containing more recycled materials
	Identification of suppliers of recycled materials and partnerships with them
	Development and control of supply chain traceability
	Development of partnerships with recyclers and Producer Responsibility Organisations
	R&D projects, market intelligence and innovation for the integration of recycled materials
	Increased customer awareness of the benefits of integrating recycled materials
Improved product recyclability	Use of recyclable materials, in particular glass for LED technology
	Collaboration with suppliers on awareness-raising, assessment, incentives to buy recyclable products and materials
	Assessment of the recyclability of existing products for improvement
	Consideration of component separability in design and reduction in irreversible bonds
	Assessment and tracking of substances and recycling disruptors (including compliance with REACH and RoHS requirements and other standards)
	Development and selection of products involving as little material as possible
	Standardised components and availability via shared platforms
	Choice of recyclable packaging
	Encouragement of re-use of lamps as an alternative to recycling

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

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)

Fluorescent lamp (or compact fluorescent lamp): light-emitting fluorescent tube with a miniaturised tube, folded in two, three or four, or rolled up, with a cap containing an electronic ballast for recent compact fluorescent lamps, or a ferromagnetic ballast for older compact fluorescent lamps (**ecosystem** definition)

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

Lamp: light source and its envelope (bulb or tube) (**ecosystem** definition)

LED - Light Emitting Diode: Electronic component which allows electric current to flow in only one direction (diode definition) and emits light (**ecosystem** definition)

Luminaire: a device for distributing, filtering or transforming light from one or more sources and excluding the lamps themselves, comprises all the parts needed to attach and protect the lamps and where applicable, the auxiliary circuits and devices for connecting them to the power supply (**ecosystem** definition)

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 lamp 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.

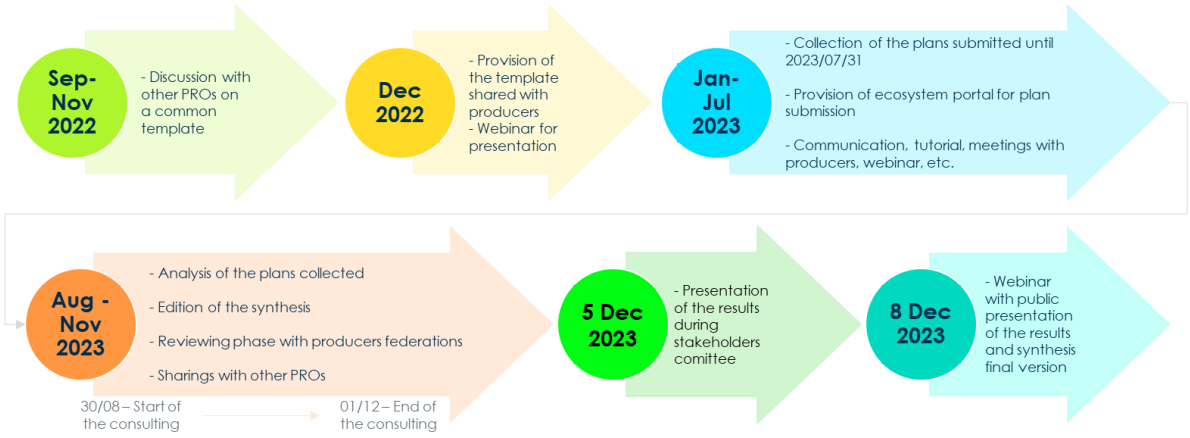
For producers in a mutual system, individual or collective plans must be sent to the PRO to which they belong. Every three years, **ecosystem** must draw up a summary of the prevention and ecodesign plans of its producer members, for publication accessible to the general public.

This summary is presented below and expresses the commitment of **ecosystem** producer members in the lamp sector to improve their waste prevention and ecodesign.

Lamps are special electrical and electronic equipment that use a wide range of technologies, with advantages and disadvantages in terms of energy efficiency, durability, initial cost, aesthetics, comfort, colour rendering, etc. In recent years, a disruption has occurred in favour of LED technology, with regulations progressively banning the marketing of certain types of lamp (incandescent, compact fluorescent, etc.). This equipment generally has a long service life, leading to a time lag in recycling activities.

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 lamps placed on the market) 79% 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 analyse the possibility of distinguishing 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 categories is considered here as a non-manufacturer. However, the number of plans received did not allow us to make this differentiation in the analysis and ensure the confidentiality of the information transmitted at the same time. The aggregated data is therefore the results presented in this summary.

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 PROs 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, 55% of the plans received by **ecosystem** used the template described above for the Lamp sector. A plan is considered to have used the **ecosystem** template format when the spreadsheet has not been modified in any way, either in terms of form (added/deleted tabs/rows/columns, merged cells, etc.) or content (names of areas/sub-areas/fields to be completed). Nonetheless, in practice, over 85% of producers who submitted a plan used the template provided by **ecosystem**, with a small proportion adapting the format to their own needs.

Other **ecosystem** support

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

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

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

4. Review of plans

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

Quantity-related feedback on plans received

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

Key indicator	**Category**	**Result**
Number of **ecosystem** producer members per type of producer in the Lamp sector	Manufacturer	62
	Non-manufacturer	717
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% of individual plans received in relation to the number of producer members in the Lamp sector	Total Lamp	28%
% of individual plans received in relation to the tonnage of lamps put on the market in the Lamp sector	Total Lamp	63%
Number of joint plans received from the Lamp sector	Total Lamp	0

For information, between 1st September 2023 and 15th November 2023, **ecosystem** received 27 additional plans that were not included in the compilation of this summary.

ecosystem did not want to provide its members with a collective plan that they could have signed up to, 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 varied in the Lamp sector.

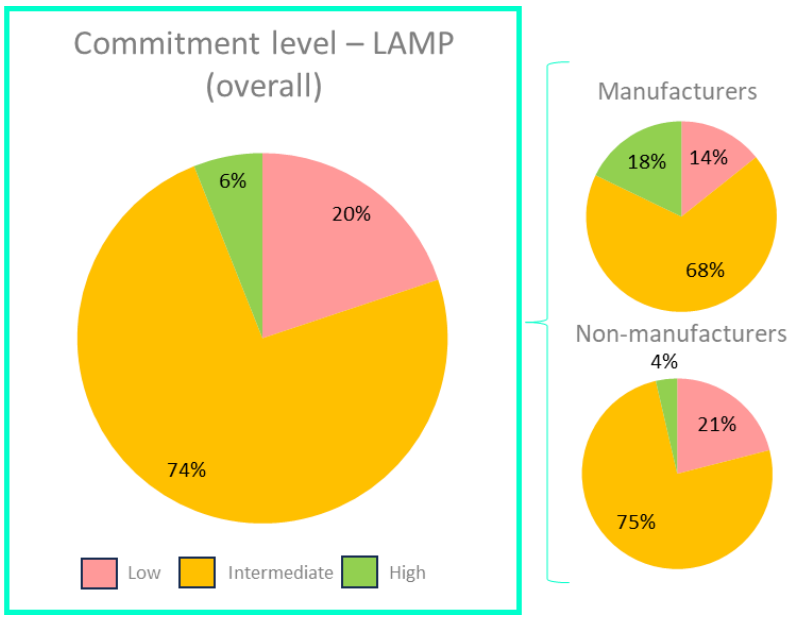
The results presented here and in the following sections reflect the commitment of producers who have adopted a position on the subject, with an encouraging participation rate.

Quality-related feedback on plans received

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

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

This assessment was applied to all the plans received from the Lamp 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.



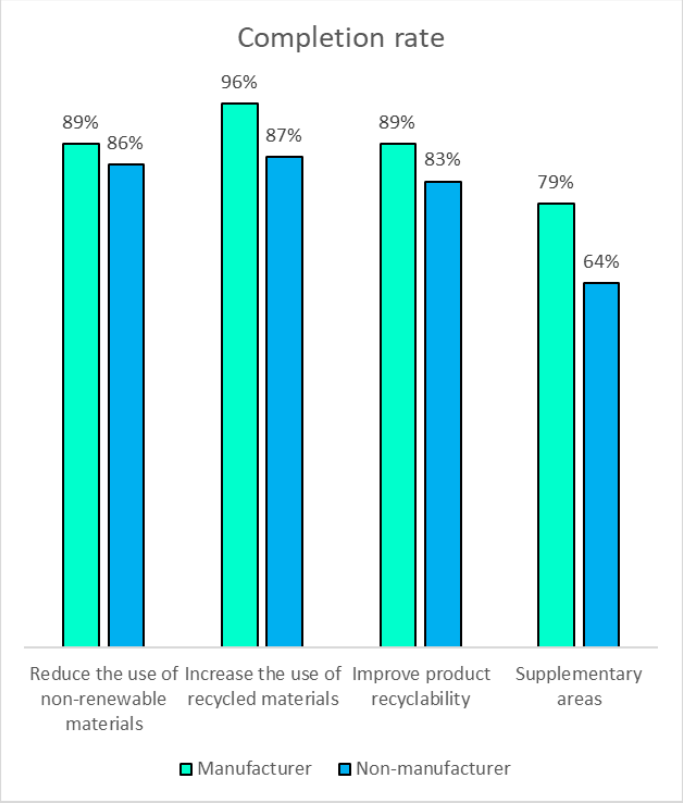
Most of the plans received are at intermediate level, which indicates that all **ecosystem** producers in the Lamp sector are well on the way to meeting the three regulatory targets.

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 lamps 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.

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

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

Two sub-areas are presented in the template:

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

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

The final rates were therefore calculated as follows:

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

Overall, most of the producers indicated actions relating to the sub-areas of the three areas addressed by the regulations. Whether manufacturers or non-manufacturers, producers are more widely engaged in "Increasing the use of recycled materials". On this last point, and on the theme of "Increasing the recyclability of our products", 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 and the percentage of recycled materials their products contain, 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).

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 lamp, 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, in general, 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**. The distinction between manufacturer and non-manufacturer producers could not be made, as the number of plans received for this sector did not allow us to ensure the confidentiality of information.

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

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

Mandatory areas

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

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

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

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

Reduction in the use of non-renewable materials

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 materials used, especially plastics
	Working with suppliers: awareness, evaluation, incentives
	Life cycle analysis of lamps to identify and reduce non-renewable materials in these products
	Use of low-energy LEDs
	Rationalisation and miniaturisation of products, ranges and variants
	Reduction in non-renewable materials in packaging, in particular through bulk sales

In general, the majority of 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 outside the scope of the lamp sector, has been to commit to reducing the use of non-renewable materials in the packaging sector.

The intention to perform Life Cycle Analyses is also mentioned, a tool that would in this case provide access to product BOM and possibly reduce the use of non-renewable materials involved. In order for life cycle assessment to fully meet the objective of this area, scenarios must be studied to compare design options with renewable and non-renewable materials.

Producers also indicate the possibility of using low-energy LEDs, enabling end customers to reduce energy consumption compared with other lamp technologies. This action is further removed from the initial objective of material efficiency, which producers are encouraged to reflect on as part of this exercise.

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:

- Raising producer awareness to the out-of-scope nature of packaging in prevention and ecodesign plans for the EEE sector
- Refocussing actions on the material efficiency of lamps, with a view to improving product circularity
- 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
	Collaboration with suppliers on awareness-raising, assessment, incentives to buy products containing more recycled materials
	Identification of suppliers of recycled materials and partnerships with them
	Development and control of supply chain traceability
	Development of partnerships with recyclers and Producer Responsibility Organisations
	R&D projects, market intelligence and innovation for the integration of recycled materials
	Increased customer awareness of the benefits of integrating recycled materials

In general, producers have committed to highly appropriate actions aimed at increasing the proportion of recycled materials in lamps 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, through sometimes quantified and very heterogeneous targets for minimum rates to be achieved on product ranges.

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 Lamps sector is also supported by the AGEC anti-waste law, which requires the largest manufacturers to display a statement on the percentage of recycled materials in the lamps they put on the market. This encourages producers to position themselves on this criterion.

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
- Encourage producers to set realistic targets for incorporating recycled materials into their products. A feasibility assessment of the proportion of recycled material that can be incorporated into products is recommended before defining the target rates. **ecosystem** is available to support producers in integrating recycled materials.

Improved product recyclability

Main trends in waste prevention and ecodesign in plans submitted
Use of recyclable materials, in particular glass for LED technology
Collaboration with suppliers on awareness-raising, assessment, incentives to buy recyclable products and materials
Assessment of the recyclability of existing products for improvement
Consideration of component separability in design and reduction in irreversible bonds
Assessment and tracking of substances and recycling disruptors (including compliance with REACH and RoHS requirements and other standards)
Development and selection of products involving as little material as possible
Standardised components and availability via shared platforms
Choice of recyclable packaging
Encouragement of re-use of lamps as an alternative to recycling

In general, producers have committed to appropriate actions aimed at increasing the recyclability of lamps 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 reduction/elimination of recycling disruptors and substances
- The standardisation of components and provision via joint commitments between producers.

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

The Household lamp 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.

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.

Producers are also planning to encourage the re-use of lamp components. This action is interesting in terms of circularity, but falls short of the initial objective of improving recyclability. Re-usability and recyclability are two different concepts, and producers sometimes tend to confuse them. Efforts by **ecosystem** to raise awareness are therefore expected.

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
- 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 lamps, 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 reuse, and by offering associated services to ensure that they last longer.

Producers also emphasised the importance of timeless design to avoid fads and ensure the long-term relevance of products.

Producers in the sector are keen to move towards new business models, highlighting the development of services associated with usage, coupled with intelligent lighting management.

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.

It should also be noted that certain trends were concentrated in the Luminaire sector (and therefore in the Household or Professional EEE sector) and not in the Lamp sector. These trends have been excluded from this analysis.

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 lamps 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. **ecosystem** has taken the approach of considering all the sectors for which **ecosystem** is approved, to be able to draw inspiration from best practices across these sectors.

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 promote reuse and repair circuits, to manage logistics and after-sales platforms, and thus constitute an important link in the chain for more circularity.

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6. Recommendations and conclusion

Feedback from **ecosystem**

In the Lamp sector, regulations defining a number of requirements for ecodesign actions applicable to incandescent and compact fluorescent lamps for example, have already been in place for many years. Manufacturers have implemented a number of energy-efficiency measures (including LED technology) on an ongoing basis, to reduce the energy consumption of lamps during their 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 few lamps 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) "Quality-related feedback on plans received".

This support, which has been much in demand by manufacturers, has also served as a reminder of the challenges facing the sector and the constraints on recycling lamps, which are complex, de-polluted items of equipment with specific treatment requirements depending on the generation of the lamp. **ecosystem warns of the standardisation of obligations and priorities required the law, which 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 Lamp 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, but also luminaires, which are to be distinguished from lamps. **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 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 lamp 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 lamp recycling
- 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.

ecosystem remains available to its producer members to continue addressing 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.

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)

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)

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)

Fluorescent lamp (or compact fluorescent lamp): light-emitting fluorescent tube with a miniaturised tube, folded in two, three or four, or rolled up, with a cap containing an electronic ballast for recent compact fluorescent lamps, or a ferromagnetic ballast for older compact fluorescent lamps (**ecosystem** definition)

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)

Lamp: light source and its envelope (bulb or tube) (**ecosystem** definition)

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)

LED - Light Emitting Diode: Electronic component which allows electric current to flow in only one direction (diode definition) and emits light (**ecosystem** definition)

Luminaire: a device for distributing, filtering or transforming light from one or more sources and excluding the lamps themselves, comprises all the parts needed to attach and protect the lamps and where applicable, the auxiliary circuits and devices for connecting them to the power supply (**ecosystem** definition)

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)

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)

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)

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

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

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

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

8. Bibliography

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Service Public. (2023). *Loi anti-gaspillage pour une économie circulaire : mesures en place et à venir*. Récupéré sur https://www.service-public.fr/particuliers/actualites/A16390

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