

The Implementation of the Extended Producer Responsibility Scheme for Waste Generated by the Construction Industry

In The Context of the French Anti-Waste and Circular-Economy law



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Abstract:

In 2020 the french Anti-Waste and Circular-Economy law was voted, aiming at reducing several waste stream including the intention to reduce the waste generated by the construction sector and help fight the illegal littering of this waste. To address this France opted for the creation of an Extend Producer Responsibility (EPR) scheme for the construction industry in order to manage the waste generated. The aim of this study is to establish which incentives lead to the inclusion of an EPR scheme in this law and understand the limitations and challenges for this scheme. To research this, interviews were conducted with relevant stakeholders and an literature review was preformed. It was found that there are three underlying incentives that lead to the inclusion of an EPR scheme in the law, an economic, environmental and organizational incentive. The economic incentives revolves around limiting the cost of handling the waste and make sure that the producer bears the cost of this. The environmental incentive originates from a aspiration to limit the environmental impact of the waste produced by the construction sector. The organizational incentive focuses on the management of the waste. The main challenge of the implementation of an EPR scheme was found to be the delay of its technical implementation, which mainly is stated by the interviewees to be due to the complexity of the law and the number of stakeholder involved. Lastly the findings of this study will be discussed and contextualized.

Foreword

I would like to thank, Jean-Michel Buf, Florence Godefroy and Marline Weber for allowing me to interview them and their insightful information. For encouraging me to pursue my studies and supporting me financially I would like to thank my Family. For accompanying me through the administrative processes and for supervising me through my thesis, I would like to thank Allis Hansen and Henrik Riisgaard.

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Throughout this report the Harvard method for references is used.

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Summary of the Study

It was established that there are three underlying incentives to the implementation of an EPR scheme in the AWCE law, an economic, environmental and organizational. The Economic incentive is mainly to reduce the cost of handling the waste from the construction sector and to make sure the producer pays for this. The environmental incentive is to reduce the environmental impacts of the handling of this waste. The organizational incentive is on how to manage this waste and how to make sure the producers pay for this. One topic brought up in all three incentives is the illegal littering of construction waste, currently taking place.

One key take-away from this study is the fact that the implementation of the EPR scheme is delayed to the 1st of January 2022. Through the interviews conducted during the study, the reasons for this delay were found to be the complexity of the scheme, the amount of stakeholders involved in it and the difficulty in the organization of the take-back points throughout the French territory.

One of the main challenges that was brought up by the interviewees was how to ensure transparency in regards to the handling of the waste. Other challenges found were how to make sure the waste is treated in the best possible way, e.g. through reuse rather than recycling. Lastly a concern was shared by the interviewees on how to make sure the producer pays for the waste handling, one of the interviewees stated here that transparency in the management of the waste should help in this regards, the Environment and Energy Management Agency will supervise the producers and the Producer Responsibility Organisations in this.

Introduction

1

High amounts of waste are produced in Europe, it is in fact estimated that 2.5 billion ton waste was produced in 2016 only and construction waste is a consistent part of it amounting to about 36% [European-parliament, 2021]. In France, the numbers for construction waste amount to 227.5 million tons in 2014 [ADEME, 2017]. For this reason, an increased focus has been given to waste management of construction waste in France, following the European Union Directives.

In 2020, the Anti-Waste and Circular-Economy law was voted thereby also creating an Extended Producer Responsibility (EPR) scheme for the management of construction waste [Law-2020-105]. By construction waste this study will understand, all waste generated by the construction industry, therefore all products and materials utilised in this sector. The schemes follow the Polluter Pays Principle (PPP) allocating the cost of handling the waste to the producing entities. The intention of this principle is to increase the circularity of the resources, from the products and materials utilised by construction sector, thus decreasing the amount of waste produced.

The laws objectives are very ambitious, however it is facing many delays and challenges in its implementation. In fact, even though the law has been voted in 2020, its implementation is far from complete.

Problem analysis 2

2.1 Construction waste in Europe and France

It is estimated that in Europe 2.5 billion tonnes of waste were generated in 2016 of which about 36 % is allocated to construction waste [European-parliament, 2021]. The French Environment and Energy Management Agency (ADEME), in its report regarding the technical characteristics of construction waste, estimates that France's construction waste represents 227.5 million tonnes in 2014 [ADEME, 2017]. Of these, 42.2 million tonnes are emitted from building waste, excluding public work waste. From this category, approximately 31.5 MT are considered inert wastes and 9.7 MT non-hazardous-non-inert wastes while the remaining 1.1 MT are allocated to hazardous waste [ADEME, 2017]. Waste generated by the construction industry, include all wastes from construction, deconstruction, demolition and public works, also representing the biggest stream of waste in France. Per inhabitant, it is estimated that France generated about 4.6 tonnes of waste in 2016, a substantial amount compared to its neighboring European countries according to the EMF.

Therefore, a closer focus has been given to the waste management of construction products and materials and its potential as a resource was reconsidered. Taking this into consideration, France has voted in 2020 for the anti-waste law for a circular economy (La loi anti-gaspillage pour une économie circulaire) [Law-2020-105], which includes the creation of an Extended Producers Responsibility (EPR) scheme for the management of the waste generated by the construction industry.

An EPR is a set of policies implemented by a government to enforce the Polluter Pays Principles (PPP), which was first introduced by the Organization for Economic Co-operation and Development (OECD) in 1972 and states that the *"polluter should bear the expenses of carrying out the pollution prevention"* [OECD, 1992]. For this reason, the Extended Producer Responsibility scheme appears to be decisive to implement to counter the wide amount of waste generated in France every year. Considering the composition of construction waste, one can imagine that the diversity and the high amount of it represents a challenge to manage.

2.2 Background for the French Anti-Waste and Circular-Economy Law

Since the early 2000, France has been reforming in different ways its waste handling and the organization of its territory. In 2015, two laws were voted: One on energy transition and green growth (LTECV) mainly focusing on France's energy consumption but also on developing its circular economy strategy, which included the implementation of a landfill tax. The second law was labeled *"new territorial organization of the republic"* and roughly transfers the competences for waste prevention and management planning from the departments to the regions. In regards to handling waste in France, it is necessary to

understand the geographical division of the country. At the present, Regions are divided into departments and the department into communes (Figure 2.1). Other forms of semi-private organisation are sometimes created to group several communes in regards of waste management. This means that the handling of waste management within the regions is to a certain extend fresh, and clear guidelines would help considerably.

This study will only consider the metropolitan area excluding the overseas territories, regions and Corsica which have a different exceptional organizational condition. The regions taken into consideration are the ones narrowed down by the law *Notre* from January the 16th 2015 [Law-2015-991, 2015]. This division reorganized the regions and updated their responsibilities. Practically, the given law does regroup most of these communes lowering their numbers to less than 3600 and sets the number of inland regions to 12 (initially 21) [Assemblée-nationale, NA]. Technically, following the will to decentralize their governance, the French state also confers with this low, new responsibilities to the local authorities in regard to waste management. Regions now have the responsibility to plan, prevent and manage their waste on their territory where they were before only responsible for hazardous wastes [Zero-Waste-France, 2018].

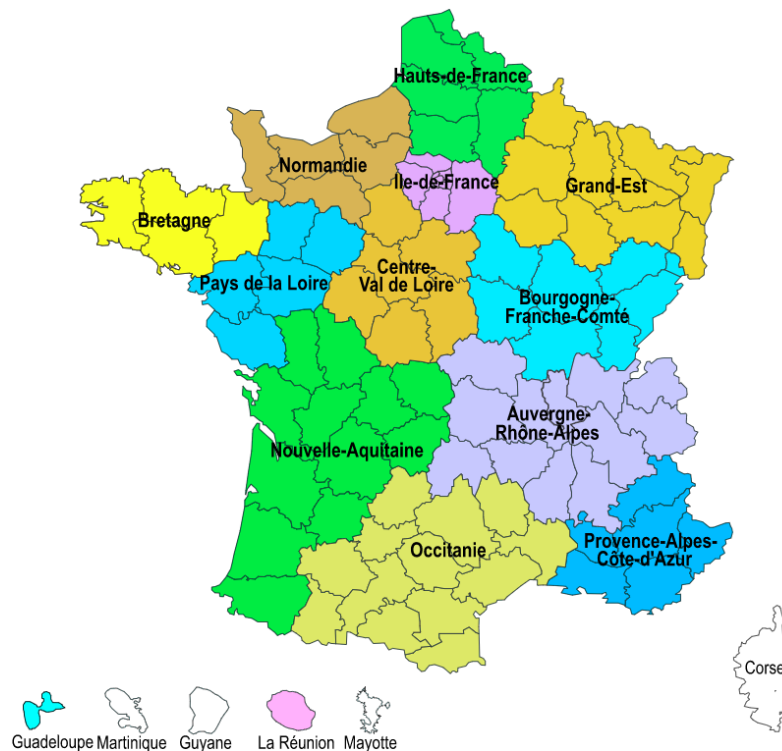


Figure 2.1. France's regions [regions-departements france.fr, N.D.]

France is also facing littering problems, where all kinds of waste are often thrown on the ground, in nature or on the side of the road. A study from the french Ecological Transition Agency (ADEME) shows that construction wastes are a significant part of it [Ademe, 2019]. According to a survey, regional and national authorities, as well as NGO's, are highly concerned of the amount of construction waste that is littered [Ademe, 2019]. However, the competences to handle that matter belong to the regions and the local authorities, which are in the for front of that problem and endorsing most of the costs.

As previously mentioned, to remedy to this problem and to tackle broadly several stream of waste, France voted in 2020 the circular economy. In general, the main objectives defined

in the law are defined as:

Objectives of the law:

- Phasing out of disposable plastic by 2040,
- Better informing consumer,
- Fighting against waste and for solidarity reuse,
- Acting against planned obsolescence,
- Better production [Law-2020-105].

The law will be enforced from January 2022 through different phases with some long-term objectives until 2040 [de la Transition écologique, 2020]. It includes the creation of several new EPR scheme for different streams of waste including one for construction products and materials among others [Vernier, 2021]. It is planned, at the end of the law's agenda, that the total amount of EPR schemes in France will be up to 22, as shown in table 2.1, which is an ambitious objective that may bring its part of constraints [Vernier, 2021].

Existing EPR schemes in France	New EPR schemes In France
Batteries*	Construction and building products and materials
Electrical and electronic equipment* (WEEE)	Commercial packaging*
End-of-life vehicles*	Toys
Household packaging	Sports and leisure items
Unused medicines	Do-it-yourself and gardening items
Vehicle tires	Motor oils
Writing paper	Plastic-tipped tobacco products*
Textiles and footwear	Synthetic chewing gum
Household chemicals	Single-use sanitary textiles, including pre-soaked wipes*
Furniture	Fishing gear that contains plastics*
End-of-life boats	
Sharp self-administration medical devices used by patients	

Table 2.1. List of products subject to EPR schemes in France before 2020 and the new ones from the Anti-waste and Circular-Economy law (AWCE). The * indicates those mandatory by the European Schemes [Vernier, 2021]

2.3 The European Waste Framework Directive

Since France is part of the European Union, it has to follow the European Waste Framework Directives, which defines EPR in 2008 as:

"Extended producer responsibility scheme" means a set of measures taken by Member States to ensure that producers of products bear financial responsibility or financial and organizational responsibility for the management of the waste stage of a product's life cycle." [DIRECTIVE 2008/98/EC, 2008]

Keeping the concept general and giving the countries the liberty to interpret and implement policies as they want in accordance with their policy system. The definition and the concept were improved with the 2018 update of the waste framework directive: The update, adds new clarity on what is expected from member states and granting them more responsibilities in the implementation of EPR schemes. Member states may now require (instead of "ensuring") producers to bear expenses for their products end of life stage. The waste framework directives from 2018 also adds in the definition "separate collection, sorting and treatment" to the organizational expenses. Finally EPR schemes are now also including an eco-design concept for waste prevention, reusability and recyclability. Eco-design allows the extension of the life-time of a product from an early stage, thus improving its reusability and recyclability. Therefore, EPR policies also covers the last stages of the waste hierarchy, as presented in figure 2.2.



Figure 2.2. Waste Hierarchy [European commission, 2018]

Given the wide extension of the construction waste in France, this topic is of high importance in terms of sustainability for the construction & waste sectors. The EPR scheme has promised very ambitious objectives with a good potential for mitigating the amount of waste. However, between the publication of the law and its implementation there are many challenges and barriers that need to be overcome. Stakeholders and political actors have different interests and opinions on the law. Identifying what these interests are and the barriers to the implementation of the law is of high importance and for these reasons this study will focus on analysing these elements.

Research question 3

As mentioned in the previous chapter, it is of importance for this research to identify how the institutional context and stakeholders' points of view that are influencing the enforcement of the Extended Producer Responsibility scheme within the anti-waste and for circular-economy law in France. Therefore, the following research question arises from the later French policy establishment.

The objective is to globally reduce waste streams in France by approaching the question through a circular-economy perspective. Focus is here given to the creation of one particular extended producer responsibility scheme meant to oversee waste from the construction industry.

How is the Extended Producer Responsibility scheme for construction products and materials implemented in France and what are the limitations and challenges?

In order to better guide the research, two sub-questions have been formulated. These sub-questions investigate each a different part of the research and are oriented at finding the methodologies needed to answer the main research question.

- Sub-question 1. How is a EPR scheme organized and how does it function?
- Sub-question 2. What are the drivers and limiting factors related to this EPR scheme?

For these sub-questions, different methodologies have been used according to the objective of the research and the required data collection. In the next chapter it is explained what methodologies have been chosen and how they led to the analysis and discussion of the collected data.

Methodology 4

This methodology section presents how the given study was conducted, which research concepts influence the study and how the data were collected and analysed.

4.1 Research Design

Figure 4.1 on the following page presents the research structure of this thesis. Beginning the research from the lens of the chosen research question; “How is the Extended Producer Responsibility scheme for construction products and materials implemented in France and what are the limitations and challenges?”. The chosen research question is the results of France’s problem of handling waste generated by the construction industry and how the country intends to address the problem.

In order to answer that question, the study can be divided into two parts, of which two sub-questions emerge: The first one questioning the functioning of EPR, “How is an EPR scheme organized and how does it function?”. Glancing at what other researches and official reports have concluded on the subject, a literature review is conducted.

Those answers open the path for the second part; “What are the drivers and limiting factors relative to this EPR scheme?”. This sub-question aims at determining what were the important elements of the given EPR scheme according to several actors that have participated in the writing of the law. By conducting interviews, the study identifies the key points of the creation of this EPR scheme from the point of view of the actors.

It is the role of the following two sub-questions to bring substantial elements and stir answers in the attempt of answering the main research question. Thus, firstly, a literature review brings some elements to understand what tool France chose to address the situation and secondly, interviews provide the necessary data for the discourse analysis.

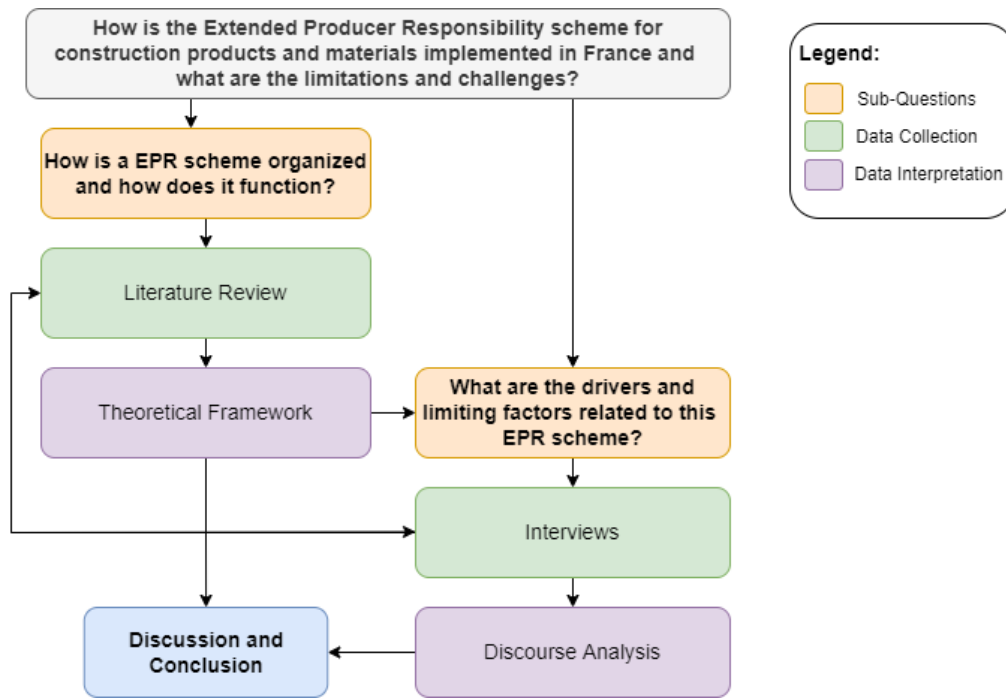


Figure 4.1. Structure of the research design in this study.

In figure 4.2, elements of this study are divided into three categories depending on what they contribute with. The state of the art defines the context of "where" this study is taking place and "what" necessary to master beforehand. It set the basis from which emerges the social process of implementing a new law in France, inspired by circular-economy principles driving the changes in the management of waste. The Inquiry here represents the main data collection phase for the later analysis.

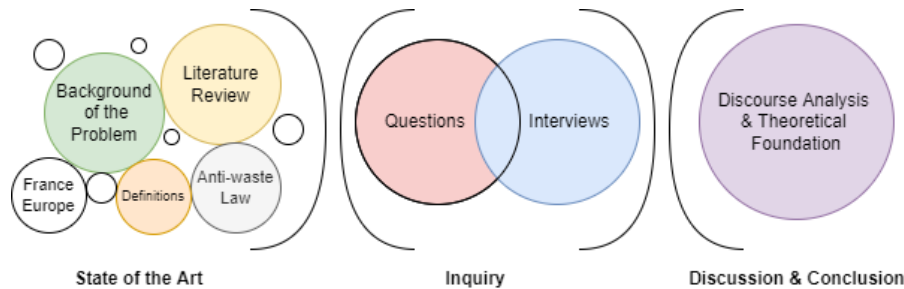


Figure 4.2. Composition of this study.

4.2 Discourse Analysis

A discourse analysis was conducted in order to elaborate upon the purpose of the EPR scheme in the law and the rational behind it. To map and understand how ideas are influencing the creation of an EPR scheme for construction products and materials within the law. Within chapter 6 on page 17 the discourse analysis was utilised to find and understand the reasoning for the delay of the EPR scheme. The discursive institutionalism article from Schmidt [2008] highly influences this section. The author explains discourse as a combination of ideas and institutional context, which can also be understood as: "What is said and to whom?" and "where and when has it been said?" [Schmidt, 2008]. Her work will here be used to identify the context and the ideas shared by the interviewees

thereby composing their discourses. Discursive institutionalism as understood by Schmidt is a unique way to comprehend the political actions of one country, including the creation of a law.

4.3 Data Collection

The data gathered for this research were solely qualitative, at first a literature review was conducted to know what has been published around the relevant topics of the given law. Hence, a literature review was conducted to gather relevant information on the subject. Furthermore interviews were utilised to map the points of view of the relevant stakeholders which have been involved in the making of the law, in order to answer sub-question 2.

4.3.1 Literature Review

A first literature review was conducted in January 2022 on the French database “cairn” looking for research which has been realized on the anti-waste and circular-economy law. The Keywords used here were “anti-gaspillage et économie circulaire” (Anti-Waste and Circular-Economy) and “Responsabilité élargie du producteur” (Extended Producer Responsibility). Four articles emerged from this research, the law being relatively recent and therefore little literature was available at that time. This first review helped to get a first impression of the subject, and what had already been researched. This led to a future structuring of the literature review, as more relevant keywords/topics were chosen.

The second and main literature review was conducted in March 2022 on the database “Scopus” seeking to gather information in particular on “Extend Producer Responsibility” and “Circular-Economy”. As the context of the present research is taking place in France under French law but also European directives, the given results were further narrowed down to the studies from European countries solely. Narrowing down the geographical scope to Europe, resulting in 45 peer-reviewed articles. Based on their abstracts, 10 of the articles were found to be of value to answer the first sub-question. In addition to the reports presented in table 4.1 on the next page. These articles were utilized to compose the theoretical framework chapter 5 on page 13, presenting what circular-economy is, defining extend producer responsibility in the French context with the later update of the anti-waste and circular-economy law. Table 4.3.1 presents an overview of the different steps made during the literature review.

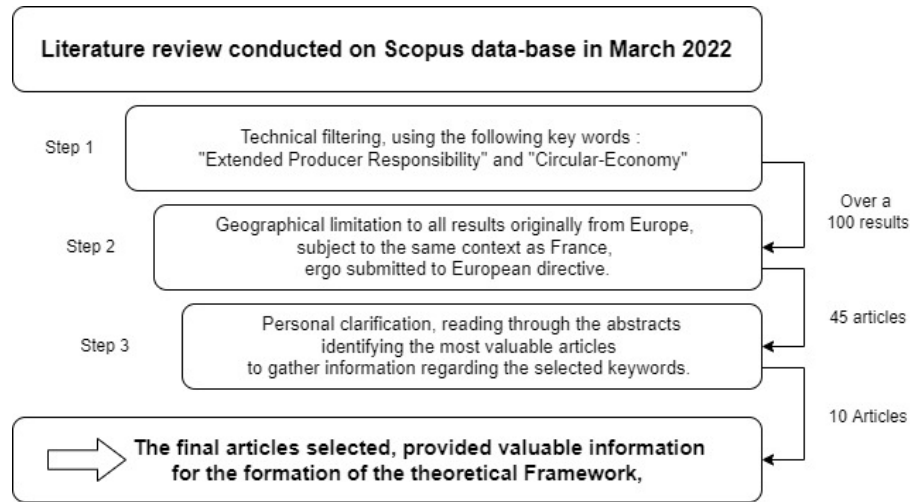


Figure 4.3. Structure of the systematic literature review on extended producer responsibility and circular-economy

Table 4.1, adds a list of official reports collected alongside the literature review. Some of the reports were often referenced through the articles of the literature review, other are relevant.

Publisher	Year	Title
OECD	2017	Extended Producer Responsibility 2nd edition
European Commission	2014	Guidance on EPR
Ellen MacArthur Foundation	2021	France's Anti-Waste and Circular-Economy law
Zero-waste-France	2018	The new role of the region in waste management policy
National Institute For circular Economy	2021	Anti-waste and Circular-Economy Law: Decoding and Analysis
ADEME	2021	Prefiguration study of the EPR scheme; Construction Products and Materials
ADEME	2017	Technical sheet; Construction waste

Table 4.1. Reports gathered with the Literature review

4.3.2 Semi-structured Interviews

In this study, semi-structured interviews have been conducted in order to understand/map the drivers and challenges related to the EPR scheme. The interviewees chosen were representatives of the public and associative institutions which have been involved in the making of the law. Thus, the objective of the interviews was to gather information on their experiences regarding the law's establishment and their point of view on the law.

During the interviews, general questions were asked, keeping the interviewer's assumptions detached to let the interviewee speak freely about their field of competences. The interviewees were free to answer the question how they wanted, and from the answers they provided more specific questions were asked. The interviews were therefore conducted in an open structure, and can therefore be defined as semi-structured interviews [Brinkmann, 2014]. Semi-structured interviews have the benefit of allowing the interviewee to speak freely and thereby gather information not considered prior to the interviews, which might be of relevance for the study [Brinkmann, 2014]. A limitation of semi-structured interviews is that irrelevant information can be gathered, this can increase the workload after the

interview as the data needs to be sorted in terms of relevant and non-relevant data [Brinkmann, 2014].

Interviewees

The persons interviewed are listed in table 4.2. They have been interview by phone, in french, over the time period of February 25th to March 25th 2022. The three interviews lasted between 30 min and 1 hour, where the interviewees answered to most of the general question presented in table 4.3 on the next page. To which more specific questions were formulated during the interview to follow up on the answer given on the prepared questions. The interviews were conducted so the interviewee had the possibility to elaborate on his or her experience of the topic (which was unknown before the interview) thus they could freely elaborate on their answers if they felt it was important.

Persons of interest	Representing	Status
Jean-Michel BUF	Mayor of the town "Blain" in the department "Loir Atlantique" Regional advisor of "Pays de la Loire" in charge of circular economy National representative of all French regions regarding waste and circular economy topic Vice president of the French national council for circular economy	interviewed on the 25th of February 2022
Florence Godefroy	In charge of construction waste and prefiguration of the EPR scheme for "Construction Products and Materials of the building sector" within the supervision department of EPR at ADEME (French environment and energy management agency)	interviewed on the 11th of March 2022
Marline Weber	Legal and European affairs manager at the national institute for circular economy, (French association which participated in the creation of the AWCE law)	interviewed on the 25th of March 2022

Table 4.2. Persons interviewed in the collection of qualitative data

Once the relations established between the parties the interview went further into the subjects mentioned by the interviewees.

The first person interviewed during this study was Jean-Michel Buf. When investigating the official documentation shared by the government regarding the law, his named was mention as the vice president of the National council for circular economy, organization which participated in the elaboration of the law.

The second person interviewed was Florence Godefroy employee at ADEME (french environment and energy management agency), in charge of handling construction waste and prefiguration of the EPR scheme for "Construction Products and Materials". She elaborated on the law and will play an active role in the implementation and monitoring of the EPR scheme.

The last person interviewed, was Marline Weber, Legal and European Affairs Manager at the time for the National Institute for Circular Economy. Among other she helped formulating the law and therefore could elaborate on the thoughts behind the scheme.

Questions

Based on the information gathered during the literature review, and the general knowledge established in chapter 2 the following questions in 4.3 on the following page arose. The intention behind the first set of questions formulated was to ask general and probing questions to extract details and clarity of the participants' experiences [Starks and Trinidad, 2007]. Furthermore this also helped make the interviewees feel comfortable and open up to more specific questions. Additional questions followed-up depending on how the interviews proceed, in order to get more specific data and depending on what

the interviewees where willing to share. The "general questions" were established prior to the interviews and are presented in the table below. These questions where necessary to conduct the discourse analysis in order to understand the rationals and ideas that lead to the voting of the law. The follow-up questions focused more on the challenges, constraints and risk of the creation of the EPR scheme and what has lead to the delay in its implementation.

	General questions to start the interview
1	Can you introduce yourself and explain to what extent you have been involved in the creation the French anti-waste and circular-economy law?
2	According to you, why was it decided in the law to create an EPR scheme for construction and building products and materials?
3	How will this EPR category function?
4	How are you today involved with waste management especially regarding construction and building products and materials?
5	What does the AWCE law change regarding waste management of construction products and materials?
6	What are the roles of the different actors involved in this EPR scheme?
7	What is the role of a producer responsibility organization (PRO) and what is your relation with them?
	Specific questions
1	What are the requirements in regard of collecting, sorting, transporting, treating construction products and materials?
2	What are the key elements in the implementation of this EPR category?
3	According to you, what has delayed the implementation of the EPR scheme of CBMP?
4	Is there a risk that this EPR scheme focuses too much on recyclability?
5	Is there a risk that producer responsibility organization (PRO) have a too many responsibilities?

Table 4.3. The interview questions

The answers from the interviewees will be utilized in the Analysis, to aid in answering the research question.

5

This chapter is based on the theory used by the articles and reports selected in the literature review, focusing on the keywords chosen, *Circular-Economy* and *Extended Producer Responsibility*. The purpose of this chapter is to introduce the theory on which the EPR scheme is based. The Circular-Economy section is utilised to understand which role EPR plays within the concept of Circular-Economy. The EPR section 5.2 on the next page explains the functioning of different EPR schemes found during the literature review and presents a catalogue with potential risks.

5.1 Circular-Economy

Reports selected alongside the main literature review, are composing this section on how circular economy is defined in Europe. In this regard, the Ellen Mac Arthur Foundation and the European Commission are the main source of inspiration. The goal of implementing Circular-Economy is to create an economy where all material flows are circular in order to minimize resource consumption and environmental impacts [EMF, 2021]. The Circular-Economy principles are visualised on figure 5.1.

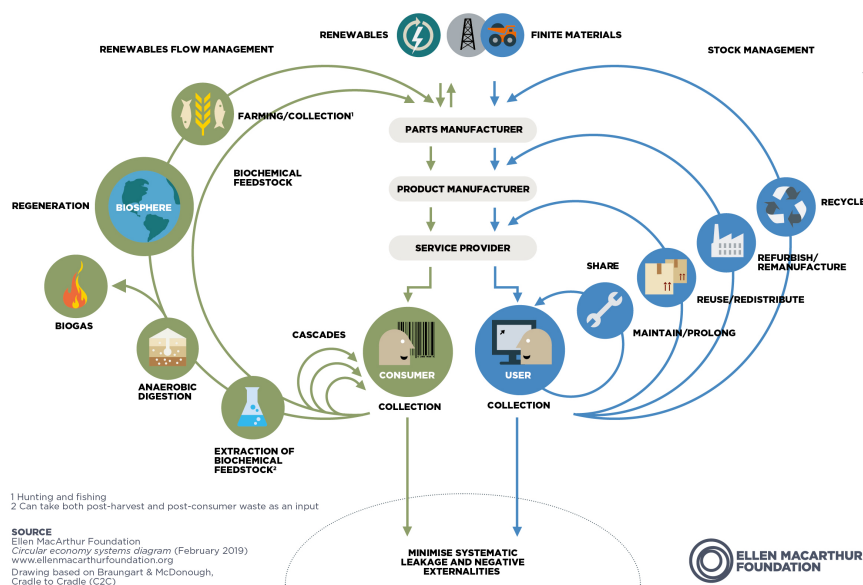


Figure 5.1. The butterfly model presented by the Ellen Mac Arthur Foundation [Ellen Macarthur Foundation, 2019].

Taking into account the table from Hekkert [2017], the shifting process from a linear economy to a circular economy can be resumed in figure 5.2. Within Circular-Economy principles, different degrees of circularity are formulated to reduce the stream of materials

that otherwise end up as waste. In this regards EPR intends to maximize the efficiency by keeping the materials within the loop and thereby reduce waste streams. Depending on the characteristics of the EPR schemes, their efficiency may differ based on the level of prolonging the lifetime of the products and materials and incorporating smarter production processes in the early life of the product. For example, different EPR schemes focus on different R's where some might focus solely on recycling and other on reuse.

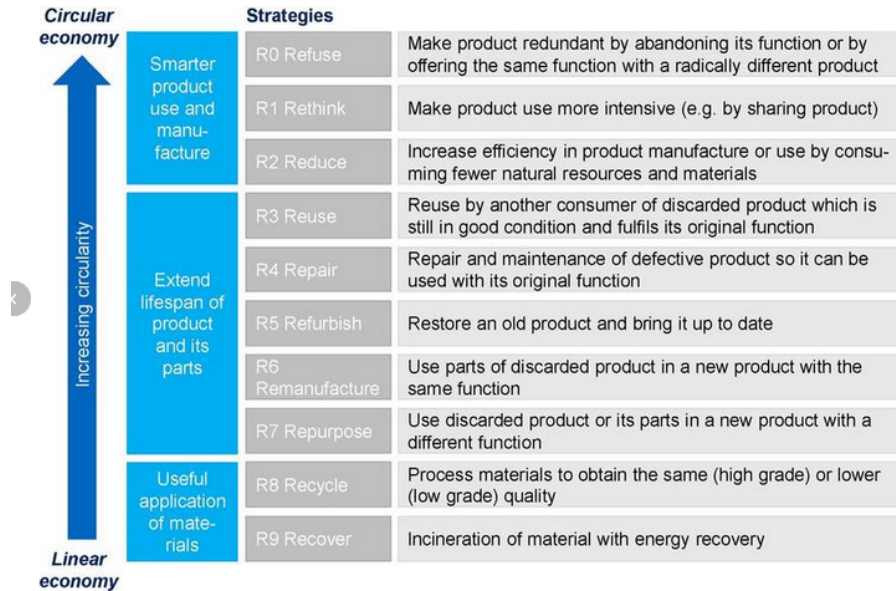


Figure 5.2. 9R table adapted from Potting et al 2017 [Hekkert, 2017]

5.2 Extended Producer Responsibility Schemes

According to Pouikli [2020], the main objectives of EPR, are to cover end-of-life costs of the products, provide an incentive for eco-design, improve the efficiency of resource use and maximise the recyclability. Influenced by the Polluter Pays Principles (PPP), Extended Producer Responsibility is realized through different environmental policies [Monier et al., 2014]. The OECD's definition of EPR is: *"an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle"* [OECD, 2005]. It argues that this approach has two main effects: One is to shift the physical and economic responsibility from the municipality towards the producers, and the second effect is to incentivize the producers to adapt their product design in consideration of the environmental impacts of their product [OECD, 2001].

5.2.1 Individual or Collective Schemes

Vernier [2018] makes the distinction between two types of EPR schemes, individual and collective. Within the individual schemes, the organization itself is responsible for handling the waste of its products. In collective schemes, producers are represented by a Producer Responsibility Organisation (PRO) to which they delegate their responsibility and pay financial contribution for the management of the scheme and the handling of their waste. Producers are expected within EPR scheme to at least pay contributions to the PRO for the post-consumer waste management of their products and material. [Vernier, 2021]. A PRO is a private body existing in a collective scheme, executing the purpose of EPR for the producer adhering to the organisation. It also has the role to supervise the handling of the waste and collect all relevant data [Pouikli, 2020]. Thus, an organisation of this

kind can make a contract with a company stating that the company takes care of the waste generated by the products of the considered organisation. This scheme is the most common one in practice [Vernier, 2021].

5.2.2 Operational or Financial EPR Schemes

Taking only the collective EPR scheme into consideration, there are two ways of managing it: either the entity runs the operations of the waste management themselves or they outsource it [Pouikli, 2020]. For example a PRO can manage the EPR scheme by organising the collection transport and treatment of the waste or they transfer part of the financial contributions to third parties such as for example local authorities for the collection of the waste.

5.2.3 EPR as an Instrument for Policy Making

EPR's are utilised as an instrument for policy making as an administrative tool that puts the responsibility of the waste management on the producers [Pouikli, 2020]. According to Pouikli [2020]: *"In this context, EPR is considered to be a policy principle. It is not in itself a legal mechanism or tool, but must be implemented via a toolbox of administrative, economic and informative mechanisms"*. This means that EPR's rely on other policy mechanisms to be put into practical use and be enforced, this could be through fines (financial indictment) or legally binding rules, setting the outline of how to treat the waste [Pouikli, 2020].

The list below presents the different ways of enforcing EPR schemes [Pouikli, 2020].

- Product take-back requirements,
- Economic and market-based instruments,
- Regulations and performance standards,
- Information-based instruments.

5.2.4 EPR's in France Context

Prior to the voting of the anti-waste and Circular-economy law, the French Government mandated Vernier to compose a thorough report on EPR's in France back in 2018. The report was updated in 2021 and translated into English gathering the new measures the law includes [Vernier, 2021]. With the Anti-Waste and Circular Economy law, not only new EPR schemes are created to cover a wider range of products and producers but considerable updates were also added to the existing schemes, the main changes are listed below [Vernier, 2021]:

- Larger eco-modulation, increasing the bonuses and penalties in the schemes for the producers based on the products environmental performances. As well as sanctions if the entities do not meet the requirements set by the law,
- Introduction of repair, reuse and reemployment funds, financed by the PROs. Thereby inciting the reuse and reparation of products,
- Intermediary reseller from online electronic marketplaces are now also covered by EPR's, thus both the producers and retailers are required to pay eco-contribution for the management of the waste,
- Every 5 years the producers are required to publish an waste prevention plan. This plan focuses both on how they intend to reduce the amount of waste produced and improve the eco-design of their products [Vernier, 2021].

5.2.5 Potential Risks of EPR Schemes

One of the risks of EPR's is that take back schemes implemented by producers or PROs could lead to certain products by-passing the reuse market and be sent to recycling plants instead [Dawson, 2019]. By reusing the products rather than recycling them additional materials can be saved [Dawson, 2019].

Policies that are used to enforce the EPR schemes can also either jeopardise or promote the schemes depending on preciseness and details of the policies as stated in Dawson [2019]: *“Nevertheless, the ambitious target of achieving circularity set in the Strategy may be jeopardised by its severe lack of detail”, “provides little explanation of how the policies will be implemented”*[Dawson, 2019]. According to Campbell-Johnston et al. [2021] this can be avoided by implementing policies with a transformative long-term perspective, meaning that the policies should focus on the long-term changes and not the short term gains. Besides this, the policies should also focus on transparency in regards to how the waste is treated and should be improved continuously [Campbell-Johnston et al., 2021].

The list below present a non-exhaustive list of risks and key points connected to the implementation of EPR schemes in the Anti-Waste and Circular Economics law. Any policy intending to implement EPR schemes should be careful to consider and incorporate this point for maximum efficiency and circularity. EPR schemes may focus on having:

- clear objectives, targets and responsibilities, any lack of details will reduce the efficiency [Dawson, 2019]
- eco-design: for resource efficiency and waste reduction [Dawson, 2019], [Purnell et al., 2019] [Avilés-Palacios and Rodríguez-Olalla, 2021]
- consumer friendliness: communication for clear public information avoiding confusions [Dawson, 2019]
- Transparency in regards to the management of waste treatment for improvements, by Administrative monitors [Rubio et al., 2019] [Campbell-Johnston et al., 2020]
- Assembling EPR schemes with other policy instruments such as a landfill tax for more efficiency [Pouikli, 2020]

From this point, with a better understanding of waste management in EPR schemes given by the literature and reports review, the research can move on the analysis of the interview. In the next chapter the point of view of different interested parties is considered from their own perspective.

Analysis 6

This chapter aims at answering the research question and the different sub-questions presented in chapter 3 on page 6. This is done through the results of the conducted interviews and literature review. Table 4.3 on page 12 list some of the questions asked during the interview in order to obtain answers from the interviewees. The questions and answers presented in this table 6.1 on the next page are based on their relevancy and thus not all the data collected is presented in this table. The analysis follows the summary of this relevant question and answers from this table.

6.1 Rationals Behind the Creation of the EPR Scheme

This section will look into the rationals behind the AWCE law and the incentives that lead to the incorporation of EPR schemes into the law. This will be done by mapping the incentives and ideas behind the law. Ideas, as Schmidt understands them, explain *"what is [the problem] and what to do?"* [Schmidt, 2008]. Or in other words, what is the problem faced and how can it be fixed? The problem identified was presented in chapter 2 on page 2, with the means to remedy; the French anti-waste and circular-economy law. The concept of Ideas mention earlier are herewith transformed into a policy [Pouikli, 2020]. However, the policy sets objectives but does not tell the practical details of the functioning of the EPR scheme for construction products and materials. This will be debated, at the ministry and published through a decree as Ms. Weber stated during the interviews.

From the data collected during the interviews, three incentives/idea have been identified for the inclusion of the EPR scheme into the AWCE law. These being the Financial incentive, the environmental incentive and Organizational incentive.

Questions	Answers		
	Jean-Michel Buf	Florence Godefroy	Marline Weber
How did you participate in the elaboration of the AWCE law?	<ul style="list-style-type: none"> Participated in the writing of the circular economy roadmap and also in the drafting of certain articles of law or amendment of the anti-waste and circular economy law. Member of the inter-sector committee for extended producer responsibility, in charge of studying the specifications, decrees and implementation decrees, in particular of eco-organizations linked to the EPR sector. 	<ul style="list-style-type: none"> From March 2020, at ADEME, we carried out a prefiguration study on this EPR category which lasted almost 1 year, with very short deadlines compared to other sectors which are smaller and which may have been less of a financial issue. We had a limited time to do it by trying to associate the actors, actors who were initially opposed to this very principle, therefore not necessarily inclined to provide us with data and to participate very actively. 	<ul style="list-style-type: none"> The National Institut for Circular Economy participated in the writing of the circular economy roadmap. Participated in ministerial working groups for a first and second law project, most of the proposition from the NICE were adopted
According to you, why was the EPR category created for construction and building products and material?	<ul style="list-style-type: none"> The quantity of waste, contrscution and building product and material represent. The quantity of waste from constructionand building material and products littered in illegal sites, and representing a huge cost for local authorities. There is a need to enforce the polluter pays principle to a greater extend. 	<ul style="list-style-type: none"> Since a few years there is a will to support incentive or create measures for better sorting of waste at the source. The actors in the building sector and in the management of this waste were not in favor of the creation of an EPR category. But bad practices of certain professionals or non-professionals in the management ofbuilding waste have emerged in the press. Three drivers: better recycling and upcycling, reduce landfill, reduce littering. 	<ul style="list-style-type: none"> General will to create more EPR categories
What are the key points of this EPR category?	<ul style="list-style-type: none"> Focusing on collection and provision points (professional recycling centers, producers and distributors). Sorting waste on construction sites, is the right way to do, and it is already an obligation from the environmental code. 	<ul style="list-style-type: none"> Free takeback. Minimum sorting standards. Takeback network. 	<ul style="list-style-type: none"> The PROs characteristics are really unique, eco-contributions are no taxes but still mandatory and paid to a private organism, the idea with this law is to impose transparency in the PRO governance. At the moment of the interview, discussions are taking place at the ministry for ecological transition for the elaboration of the specification agreement, huge amount of money are at stack. It is unsure if there will be reusability objective in the specification agreement, the risk is that there will only recyclability objectives.
In practice, what is the roles of ADEME, PRO and local authorities?	<ul style="list-style-type: none"> Generally, an eco-organization manages the transport and treatment of waste that is collected in the recycling center, must participate in the financial or operational management. The regions now have the competence to lead and coordinate circular economy public policy and in particular on industrial and territorial ecology. The regions also have access to all the data on EPRs made available by the PROs. 	<ul style="list-style-type: none"> We have a role of monitoring and observing the EPR schemes. 	<ul style="list-style-type: none"> PRO are operating in a very particular situation, the eco-contributions are not taxes but mandatory, and paid to a private organization.
On which circular economie strategie does the AWCE law rely on, and is there a risque that the law focuses too mch on one of them?	<ul style="list-style-type: none"> On this topic the AWCE law didn't add many obligations but mainly sets into place new schemes. AWCE law from 2020 combined with the energy transition and green growth law from 2015, are heading towards reducing landfill and increasing recyclability and in this regard the collection scheme must be properly implemented. 	<ul style="list-style-type: none"> Initially producers must pre-finance the collection and management of the waste that their products will generate, with this law, RPO will also have to take an interest at eco-design and prevention of waste production. 	
Why has the implementation of this category been delayed?	<ul style="list-style-type: none"> Probably, some lobbying may have delayed the negotiations and the establishment of the law. 	<ul style="list-style-type: none"> Too ambitious, too complex, too many actors. and the final Holder of the products is in this category not a private individual, rather professional individuals. Adding complexity. 	<ul style="list-style-type: none"> Officially the covid crisis is one of the reasons for the delay, an extended producer responsibility scheme is also a big reform to implement. The territorial network for the recovery of construction and building products and material waste is a complex task, On average there has to be one every 15km (depending on rural and urban area). To this day, the administrative decision decree on the specification agreement is still missing. This document is required so that the PRO can apply to the EPR scheme. Without any PRO nothing can be set into place.

Table 6.1. Summary of the most relevant answers form the interviews.

6.1.1 Financial Incentive

Mr. Buf a representative of the local authorities, shared his concerns regarding the cost that construction waste represents financially for the communes, departments and regions of France. He is from the local authorities and thus to an certain extend represents their point of view. His main incentive for the implementation of an EPR schemes in the law is to avoid the cost that illegal littering represents and generally just bring down the public costs of handling waste form the construction sector, passed along to the citizens. This will shift the cost from the local authorities to private companies (PROs).

Another financial incentive was shared by Ms. Godefroy, referring to the implementation of financial incentives to ensure sorting of waste at the construction site. These financial incentives can be translated into bonus or penalties when reaching or neglecting the objectives set by the AWCE law. Since the take-back of the wastes is free under the condition that it has been sorted, it is expected that companies will no longer participate in the action of illegal littering, thus taking action against illegal littering of construction waste.

6.1.2 Environmental Incentive

Ms. Godefroy also emphasizes the environmental incentive leading to the inclusion of an EPR scheme in the AWCE law, with the idea being to protect the environment by limiting the amount of waste sent to landfill and reduce the illegal littering of construction waste. She also stated that the current practices for the handling of construction waste have an huge impact on the environment, especially the waste that is littered illegally in the environment. Finally, another argument from Ms. Godefroy, was that the argument that shifting from a linear economy towards circular-economy, by increasing the recycling and upcycling of waste and thereby decreasing resource consumption, also participates in protecting the environment.

6.1.3 Organizational Incentive

Throughout the interviews an organizational incentive was also identified as a reason for the inclusion of an EPR scheme in the AWCE law. This mainly kept referring back to making the management of the waste more structured and create transparency in regards to how the waste is handled. Mr. Buf had a great emphasis on fighting illegal littering by implementing free take back requirements into the EPR schemes. Besides this he stated that it was important to make sure the producer pays for the pollution of the waste, this can again be done through transparency requirements but also through legal requirement according to Mr. Buf. Ms. Godefroy referred to take back policies and to the fact that ADEME will supervise PROs in order to ensure good conduct and transparency. Thus the organizational incentive is mainly based on planning the full life cycle of materials and products to waste treatment and the struggle with illegal littering.

6.2 Implementation of the EPR Schemes in the French Anti-Waste and Circular Economy Law

According the Ms. Godefroy the reason for implementing EPR schemes in the Anti-Waste and Circular Economy law was due to bad practices from professionals as well as non-professionals within the waste treatment of the construction sector. She additionally states that even though most of the sector was initially against the idea of EPR schemes it was agreed upon in the end due to the current state of affairs. Ms. Godefroy stated

that the main driver for the implementation of EPR scheme is to reduce the amount of waste ending up littered or landfilled and improve recycling and upcycling methods of the products and materials. This fits well together with what Mr. Buf stated as the reason for incorporating an EPR scheme, which is to reduce illegal littering for waste from the construction sector.

The interviewees were also questioned about what they believed the key points of the EPR schemes are. Mr. Buf stated that the key points were the collection and treatment of the waste. With this helping to prevent illegal littering of construction waste in the future while also implementing the current practices. He also added that the sorting of the waste at the construction site would be important to make sure the EPR schemes work as intended. He additionally also added that this already is an obligation from the environmental code.

Ms. Weber states that PROs are a unique organisation and that the ECO-payments aren't just taxes but there against mandatory payments to private organisations. She elaborated on this by adding that the law needs criteria to impose transparency in the PRO governance. Thereby ensuring the payments are made and the arrangements made by PROs are consistent with the law. Ms. Weber also stated that at the moment of the interview, discussions were taking place at the ministry for ecological transition for the elaboration in regards to the specific agreements between PROs and third party organisations. She also stated that huge sums of money are a stake here. She also expressed a concern in regards to the risk that there will only be recyclability objectives and no reuse objectives. Thus this falls quite well in line with what the other two interviewees stated, but she also expresses a concern in regards to the objectives of the law, but also the unique possibilities and challenges that PROs provide.

All three are directly involved with the law but at different stages, Mrs. Weber, through her organisation was mostly engaged in the writing of the law, contributing with proposition, ideas and objectives to the law in general. Mr. Buf through his national missions has also been involved in the writing of the law, but is with his position as mayor and regional advisor to another extent also directly influenced by the law on the ground. At last Mrs Godefroy, was more specifically responsible in the preparation of the EPR scheme. The law stated the implementation of the EPR scheme was supposed to be from the 1st of January 2022 but it has been delayed by one year.

6.3 Reasons for the Delay of the Anti-Waste and Circular-Economy Law

One of the important discovery confirmed during the interview is the postponement of the EPR scheme creation regarding construction products and material. The scheme has for some reason been delayed, the interviewees have been questioned about it and shared some elements of justification. One of the main take away confirmed during the interviews for the reason for the delay of the law, was stated to be due to the complexity according to Ms. Godefroy. She also stated that the ambitions of the law and the sheer amount of stakeholders as reasoning for the delay. The large ambition and the number of stakeholders in the law makes it more difficult to find a common agreement. Ms. Weber pointed out that there needs to be a territorial network of collection points for waste. The take-backs of the waste is free of charge if it has been sorted beforehand. On average there should be a collection point for the take-back every 15 km, although this can change depending on whether the area is classified as a rural or urban area. The implantation of this network of collection points has not yet been agreed upon, thus delaying the law until an agreement

is reach. Mr. Buf states that the delay may also have been coursed by lobbying in regards to the structure of the law.

6.4 How to Ensure the EPR Scheme in the French Anti-Waste and Circular-Economy Law will be Functional

The AWCE law from 2020 combined with the Energy Transition and Green Growth law from 2015, are heading towards reducing landfill and increasing recyclability and in this regard are a part of the circular economy framework according to Mr. Buf. Additionally Mr. Buf stated that new collection schemes must be properly implemented for the AWCE law to work properly in a circular Economy perspective.

Ms. Godefroy stated that producers must initially pre-finance the collection and management of the waste of their products for the law to work. Besides this she also stated that PROs and producers need to take/have an interest in ECO-design and prevention of the production of construction waste. The later will be reinforced by the fact that the producer themselves will have to pay for the treatment of the waste, thereby reducing the amount of waste means paying less and thereby a bigger turnover by the PROs. This is all supported by the ECO-modulation part (previously mentioned in section 5.2.4 on page 15) and by Mr. Godefroy, granting bonuses or Penalties to the the PRO and producers which are not complying with the objectives of the law. Ms. Weber, mention that there is a potential risk that the administrative decision decree will only focus on recyclability objectives and not enough of reuse objectives.

Discussion 7

In the previous chapters, the data collected has been arranged into a collection of theories and an analysed. Before discussing the results of these chapters, it is important to discuss how the selected methods have influenced the findings of this study, as well as the benefits and limitation they bring but also their limitations.

7.1 Methodological Choices

The Literature Review contributes with a collection of theory on which the subject of the study is based, defining the the main concept behind Circular-Economy and Extended Producer Responsibility. This methods was very efficient with gathering the all the official reports and published articles on the subject. However, some limits were identified; the first attempt on researching the studies covering the Anti-Waste and Circular-Economy law has resulted in very few articles that were relevant for this study, because of the time since it was voted in 2021. Nevertheless, it gave a general understand on what is contained in the law. For this reasons, a second literature review was conducted, at a later stage of the research, aiming at a broader scope with the use of a wider database. In this case, new updated literature was found and it facilitated the writing of the theoretical foundation but also represented a high number of data to process.

The theoretical foundation, presented in chapter 5 on page 13, is unique to this research and restrained by the chosen criteria. The Theoretical foundation is not objective but is subjective due to the researcher's view and the articles used to base it on. The greatest constrain may have been the time to elaborate further concepts and add more references, this is affiliated to the significant amount of literature gathered. More time, could also have resulted in more literature gathered and thereby reduce the bias from the literature. Nonetheless considerable material was found for the foundation of this study, contributing to the state of the art, reminding the fundamentals of Circular Economy and the different understandings of EPR and then finally allowing a confluence with the result of the interviews.

The semi-structured interviews method was used to collect further qualitative data, and allowed this study to grasp several points of view of relevant actors involved in the creation of the law. It was probably the most delicate part of this study for the uncertainty in collecting relevant data from responsive and forthcoming interviewees. At the end, only three interviews were conducted but the information shared by the interviewees was of high quality and thus highly valuable for the analysis. Besides, the persons interviewed were affable and helpful during the interview making more like a friendly conversation. Another reason to collect data from the actors directly is the fact that the law is still young and the implementation of the EPR scheme is at its beginning. This means that all data regarding the scheme is not publicly available, therefore it was necessary to seek the information at the source, from stakeholders directly involved in the decision-making process. This allowed the study to get insights and further information that was not available elsewhere.

The data collected for analysis could have been improved by increasing the amount of interviews. Furthermore, another way could have been to identify another group of

stakeholders involved to the EPR schemes, with a different interest or point of view. By interviewing other stakeholders impacted in different ways by the EPR scheme, the study could have approached the topic from a different angles. Anyways, the way it has been done within this study was sufficient for conducting the analysis. Probably, different results could have been collected, if the interviews were conducted with different stakeholders representing the same organisation or stakeholders that were present in another stage of the development of the law. Thus, it can be argued that the findings of the interviews was subjective to the interviewees and their personal opinions and experiences.

Even though the objectives of the two methods are converging towards identifying a similar set of data, some more connections could have been made. By putting those two methods into perspective, a better combination may have been assembled, eventually intertwining the results from one method with another, thereby strengthening the relevancy of each of the methods utilised during the study. Nonetheless, a relation between the two set of data was established during the study and this has been proven pertinent.

7.2 Examination of the Rationals

The main purpose for the creation of the EPR scheme for construction products and materials waste is to ensure that producers pay for the end of life treatment of their products. This being the general rational behind EPR schemes, as stated by Vernier and Pouikli. In addition, three incentives described in chapter 6 on page 17 are identified as the main reasons for the creation of the EPR scheme in the french AWCE law . These incentives have been identified through the discourse analysis of the interviewees, and represent the interviewees professional opinions and the rationals behind of the EPR scheme. The ideas described do not belong to one stakeholder or organisation in particular but they are the expression of a global trend. These incentives follow the growing environmental concerns, the will to control and overview each steps (in this case all the life cycle of a product), this was also brought up during the interviews. The incentive were never explicitly mentioned by the interviewees, but their answers were categorized into three categories stressing out the main concerns.

For the financial incentive, the concern regarding the expenses of handling the waste for a public organisation, indicates the responsibility Mr. Buf has regarding the citizens he represents and the commune he leads. The financial incentive is seen has being a motivation to avoid expenses and cut off spending. Here the prevention of illegal littering of construction waste, that is currently happening all over France was also mentioned as one of the main incentives. Currently it is the duty of the public sector to clean up the waste that has been illegally littered, by fighting against littering more money is thus saved by the public sector. The financial incentive can be translated into a tool to achieve the objectives of the EPR scheme, another variation is shared by the interviewees referring this idea as an instrument to influence producers to achieve sustainable objectives. This is done by giving out bonuses or inducing penalties in relation reaching or breaking of the objectives set in the scheme.

The environmental incentive for the law falls back to the fact that the whole idea behind it is to have a more positive impact on the environment. In the last few years there has been a growing awareness and concern about the environment and thus it has become ever more important to reduce environmental impact [Lemmons, 2022; Green Book Directory, 2008]. This is also stated as an incentive for including an EPR scheme in the AWCE law, as it could help to reduce landfill and illegal littering, thereby decreasing the environmental impact from construction waste. Some of the interviewees mentioned the concern that

the take-back schemes could be used as recycling schemes rather than promoting reuse practices. In section 5.1 on page 13 the 9R's presented indicates that reuse is preferable to recycling. In other words recycling would use more energy and maybe even additional materials, whereas reusing the product, would have no additional environmental impacts [Hekkert, 2017]. Thus, in order to reduce the environmental impact of construction waste the EPR scheme should encourage reuse rather than recycling and thereby avoid un-optimal solutions.

7.3 Reasons Behind the Delay of the EPR Scheme

The interviewees stated multiple reasons for the delay in the implementing of the EPR scheme within the AWCE law. These range from lobbying to the scheme being too complex to a rudiment agreement in regards to the placement of collection/take-back point. One of the interviewees argues that the main reason might be the lobbying of some actors to avoid or delay the the EPR scheme. This correlates to an additional argument shared by another interviewee: she mentions the fact that a high amount of actors are impacted by the EPR scheme, therefore the discussions and negotiations are taking a long time. At last the free take-back network to spread throughout the french territory is an enormous tasks, the thread being narrow, with specif conditions and depending on the characterisation of the area.

7.4 Contributions

In section 5.2.4 on page 15, a non-exhaustive list of innovations to the management of EPR schemes in France is presented. This list presents ambitious improvements, especially with the creation of a scheme handling so much waste and impacting so many actors. The EPR scheme for the construction industry progressing towards its implementation and incorporating this innovation, it is questionable whether France will succeed in its endeavour or not. A successful implementation of the scheme would be a considerable achievement and serve as a reference for other countries. On the other hand, should this implementation fail, it would still bring some learning to the community. If the implementation fails it would make the challenges and limits more apparent and thereby helping others to handle with these.

Conclusions 8

This thesis' objective is to investigate the implementation of the EPR scheme for construction products and materials incorporated within the new Anti-Waste and Circular-Economy law in France. The research question of this study presented in chapter 3 on page 6 is:

How is the Extended Producer Responsibility scheme for construction products and materials implemented in France and what are the limitations and challenges?

During the literature review presented through the chapter 5 on page 13, it is shown on what ground the EPR scheme is to be implemented through the AWCE law. The main challenge to this date is to figure out how the scheme is to be implemented in practice. This has lead to a delay in the implementation of the EPR scheme, multiple reason where stated for this delay as shared in chapter 6 on page 17, such as the complexity of the scheme, possible lobbying, the lack of an agreement on where to place take-back points etc. Some limitations of the law also came to light such as the risk of the scheme encouraging recycling schemes rather than up-cycling or reuse practices. During the interviews it was established that transparency in regards to the scheme and the handling of the waste was an important criteria for the interviewees.

The organization and functioning of the EPR scheme is presented in chapter 5 on page 13, where it became apparent that producers either can take care of the waste themselves or outsource the treatment. When the treatment is outsourced it is still the producer or Producer Responsible Organisation's (PROs) that pay for the cost of the treatment.

The incentives leading to the creation of the scheme, have been classified as the financial, environmental and operational incentives which are the main drivers identified during the study.

There is a lot at stake with the publication of the decree setting up the practical implementation of the EPR scheme, basically the law may be very ambitious on certain objectives but in the same time very vague on how these will be achieved. This is later communicated through the decree however until it has been published nothing guaranties that the objectives as they may be understood, will be met.

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