

Competition among Producer Responsibility Organisations and role of municipalities in an EPR system

Case study of EPR for household packaging in Belgium, Germany
and Austria

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Abstract

The design of a policy based on the Extended Producer Responsibility (EPR) principle can involve one or several Producer Responsibility Organisations (PROs) as well as various degree of involvement on the part of municipalities. The thesis is analysing the implications of different choices regarding these two aspects in light of the experiences with EPR systems for household packaging in three European countries – Belgium, Germany and Austria.

The three countries are analysed in parallel, relying on how the systems are perceived by a number of relevant stakeholders (PROs, obliged industry, local authorities and public waste management companies, the EU and the OECD, academics, public authorities and the private waste management sector). Stakeholder perspectives were gathered through interviews and desktop research. The information was examined with the help of an analytical framework and compared to insights from literature analysis on competition and on the role of municipalities in an EPR system.

The research has found that there are many country-specific factors that influence how competition among PROs and involvement of municipalities play out. The research supports the view that the general benefits of competition are realised without competition on the PRO level. Further, the comparative analysis reveals a number of important arguments that seem to favour non-competition on the PRO level as well as an active role for municipalities in collection activities under the EPR system. However, a number of considerations are highlighted that need to be taken into account for the benefits from such implementation to hold true.

Keywords: extended producer responsibility (EPR), packaging waste, producer responsibility organisation (PRO), competition, municipalities

Executive Summary

Extended Producer Responsibility (EPR) reflects the idea that producers who put products on the market should assume responsibility for them beyond the commercialisation stage and in particular for their end-of-life treatment. EPR is applied through a combination of policies and instruments to manage waste from different product types in various contexts.

Packaging is one such product type. In the European Union (EU), the Packaging and Packaging Waste Directive sets targets for recycling and recovery rates for packaging waste overall and according to different materials. The Directive does not prescribe which instruments should be used to reach the targets, but leaves it to the member states to design an appropriate system when they transpose the EU legislation into national law. The majority of member states have chosen to reach those through the implementation of EPR policies including in the form of product take-back mandate. Such a mandate requires producers to take back the packaging they put on the market once it is disposed of by consumers and treat the waste in order to achieve the targets set in national legislation. For reasons of practicality, instead of assuming their responsibility individually, producers usually join a so-called Producer Responsibility Organisation (PRO). A PRO is a collective body which becomes in charge of meeting the legislative requirements of producers on their behalf and against a financial contribution on their part.

Despite some common practices in the implementation of EPR policies based on a take-back mandate, there is quite some variation in the actual implementation and the performances of various member states. Concerning implementation, variations in relation to two aspects are particularly topical and subject of current debates. The first one concerns the number of PROs present in one country – there can be one or several non-competing or a number of competing organisations. The second aspect is related to the degree to which further actors are implicated in an EPR system and mainly to the role municipalities are playing. These two aspects crystallise as issues worth addressing in view of the fact that several countries are initiating changes and these changes occur in different directions (introducing competition among PROs, discussions around the fact that such competition is ruinous, giving more responsibilities to municipalities or less). It appears that there is lack of understanding of what the best approach is and what the consequences of various options are.

In this context, the purpose of the thesis is to bring some level of clarity into what different choices with respect to the two aspects imply. Therefore it is decided to look at the experience of countries that are achieving high results and are often cited as examples in terms of their performance. The three selected countries have been among the first ones in Europe to implement EPR policies for managing household packaging waste and today they have well established, although still evolving systems. The three countries combine the two aspects in different ways. In Belgium, there is one single PRO for household packaging waste which works in close collaboration with municipalities. Municipalities are responsible for organising collection and sorting packaging waste and the PRO is in charge of marketing the material and contracting with recyclers. In Germany and Austria, the PROs have full organisational responsibility and municipalities play only a limited role. In Germany there are ten PROs in operation at present, while in Austria the currently monopolistic PRO will be faced with competition starting from 2015. Using the achievements and challenges met by the systems in the three countries, the thesis seeks to draw conclusions as to the consequences of various choices and thus contribute to the purpose.

Based on the stated purpose, the following research question was posed and served as guidance to the research:

What are the implications of the (absence of) competition on the PRO level and involvement of municipalities in the EPR systems for household packaging waste in Belgium, Germany and Austria?

Instead of performing a formalised comparison based on defined quantitative measures, the systems in the three countries were analysed in parallel, relying to some extent on how they are perceived and evaluated by concerned actors and complementing perceptions with information from other sources. Primary data was collected by interviewing stakeholders representing PROs, obliged industry, local authorities and public waste management companies, the EU and the OECD, as well as academics, public authorities and the private waste management sector. While the selected stakeholders give a good overview of the relevant actors, only a small number of interviews for each stakeholder group could be conducted. It was attempted as much as possible to make up for this limitation and ensure the representativity of information by also looking at written sources. Information on stakeholder perceptions was examined using an analytical framework and insights from a literature review on competition and on the role of municipalities in an EPR system.

The research has established that in Belgium, all stakeholders are overall very satisfied with how the system is set up and functions. Different factors contribute to this positive attitude and high level of acceptance. In Belgium there is one single PRO responsible for household packaging that is not-for-profit and managed by the obliged industry. There is strong cooperation and high level of involvement of municipalities especially at the stage of collection. The two aspects are seen as crucial for the success of the system as they have overarching implications. The organisational monopoly minimises transaction costs for the parties involved, and at the same time ensures fully functional competition on the operational level where approximately 90% of total costs occur. The status of the PRO implies that no profits are generated while possible revenues are reinvested into the system, for instance in the form of communication campaigns to the general public or support for obliged companies to optimise their packaging. The not-for-profit status allows high level of transparency in all operations and activities and contributes to creating a confidence among the parties involved. The municipalities are seen as the most appropriate actors to influence and stimulate the behaviour of citizens in the wanted manner as ultimately the citizens are decisive for the success of the system through the decision and the act of correct separation of packaging waste. Therefore, the involvement of municipalities at the stage of collection (whether implemented directly by public waste collection operators or contracted to private companies) is strongly favoured under certain circumstances (use of standard cost calculation methods for the cases where municipalities perform the service themselves, cooperation with the PRO on the choice of contractor in the case of a private operator). The rules of interaction between the PRO and municipalities and the framework for the operation of the PRO are defined in the legislation and an independent authority oversees the implementation. The continuous dialogue among stakeholders and the dynamics created by the involvement of the obliged industry in other ways than only financial contribution creates incentives for continuous improvement and has solidified the system in the long run.

For Germany the research has revealed wide variation in opinions among the stakeholders. The costs of the system with ten competing PROs today are around twice as low as a decade ago when there was still a single PRO on the market. This is why some actors portray the significant cost decrease as a clear advantage of competition and as an indication of the inefficiency of a monopolistic structure. However, the competition among PROs in Germany was introduced shortly after effective competition on the operational level (operations related to collection, sorting and recycling of packaging waste) was established. Therefore, it is difficult to determine whether the general argument for favouring competition, as outlined by

economic theory, is supported on the basis of the German example. The outright attribution of the drastic cost reduction to the introduction of competition seems more to indicate the general preference of the person or the institution she is representing for competition. Similar conclusion for politically driven statements comes out from the discussions around the involvement of municipalities in the system. While there is sound rationale for municipal role for collection activities in terms of avoiding consumer confusion, the discussions are led in the direction of power contentions rather than exploring solutions that would be acceptable for all parties.

In Austria, the new waste management law from 2013 aims to create conditions for “fair competition” among PROs. As a result several profit-entities are preparing to enter the market and be in direct competition with the incumbent not-for-profit PRO. Several stakeholders are sceptical of the changes and see no possibilities for a price differentiation significant enough to offset the increased complexity and associated efforts and costs.

Many factors specific to the national context in each country play a role in the way competition on the PRO level and involvement of municipalities affect the functioning of the system. Several general conclusions could be drawn from the experiences in the three countries.

It is important to take a long-term perspective when evaluating the performance of a system as it needs time to develop. The experiences stress the need for ensuring effective competition, but not necessarily at all levels. Having a single PRO has many advantages under the condition that mechanisms are present to avoid potential monopoly abuse. Competition on the PRO level adds a lot of complexities and makes the system more vulnerable to loopholes and illegal behaviour. Strong regulatory framework then becomes paramount, but this in turn increases costs for enforcing the rules and controlling the system. Irrespective of the choice, efforts should be directed to ensure that risk of monopoly abuse is avoided in the first case, and a level-playing field among the competing PROs is ensured in the second. The general benefits of competition would be realised if attention is focused on the level of waste collection and treatment activities instead as this is where the most significant proportion of the total costs occur. The experiences from the three countries suggest strong arguments in favour of active involvement on part of municipalities in the EPR system, especially at the stage of collection of the packaging waste. However, good control, clear rules and operation under market conditions are required to ensure that such involvement is beneficial.

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Abbreviations

DMB – Decision-making body of the Interregional Packaging Commission

EPR – Extended Producer Responsibility

EU – The European Union

IVCIE – Commission Interrégionale de l’Emballage (Interregional Packaging Commission)

PRO – Producer Responsibility Organisation

VKU – Verband Kommunalen Unternehmen (German Association of Public Utilities)

WM – Waste management

1 Introduction

1.1 Background and problem definition

Extended producer responsibility (EPR) can be defined as a policy principle according to which producers who put products on the market take responsibility for those products in the various stages of the products' life cycle and, in particular, for their end-of-life treatment (Lindhqvist, 2000)¹. The implicit idea is that when faced with the situation of having to treat their products at the post-consumption phase, producers will have an incentive to reconsider their products' design upfront and thus promote environmental improvements of product systems in the long run (ibid.). Rather than implying one single policy design, EPR can be achieved through a combination of policies and instruments, in order to flexibly adapt to differing local contexts, legislative climates, economic situations or legal constraints (OECD, 2013b). Today, EPR is applied globally to manage post-consumer waste from different kinds of products².

Packaging is one such product type typically addressed by EPR policies. In the early 1990s, several European countries have adopted legislation requiring producers of packaged goods to take financial and sometimes organisational responsibility for managing the packaging once their products become waste. These individual initiatives were followed by the adoption of an EU-wide legislation in 1994 – the Packaging and Packaging Waste Directive (the Packaging Directive or the Directive)³. The Directive aimed at harmonising national measures to reduce the environmental impacts of packaging and packaging waste and to safeguard the functioning of the internal market. Although the Directive does not impose EPR⁴, it indirectly invokes it insofar as it requires Member States to establish systems for the collection and recycling of packaging waste with the view of achieving a set of mandatory quantitative recycling and recovery targets (Packaging Directive, Article 7). As a result, most European countries have some kind of EPR policies in place for managing packaging waste (Figure 1-1)⁵.

EPR for packaging is commonly implemented through a take-back requirement, meaning that industry – fillers and distributors of packaged products – is required to collect its packaging after use and to achieve certain recycling and recovery targets.

¹ In the European Union, EPR is referred to as principle in two waste stream Directives (on waste electrical and electronic equipment and on batteries and accumulators). By the OECD, EPR is defined as "environmental policy approach" (OECD, 2001).

² In a number of countries EPR-like systems are introduced using other terminology, such as "product responsibility" or "product stewardship".

³ European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, OJ L 365 of 31.12.1994.

⁴ Three further EU waste Directives – on waste electrical and electronic equipment, batteries and end-of-life vehicles – explicitly mandate or encourage the application of EPR.

⁵ For practitioners in the field, several details in the figure can be subject of debate (whether tradable permits system – as implemented in the UK – can be counted as EPR; whether the systems in Poland and Lithuania are better defined as tradable systems; etc). Nevertheless, for the purposes of the thesis it is seen to be illustrative enough of the fact that most countries have opted for EPR to manage packaging waste.

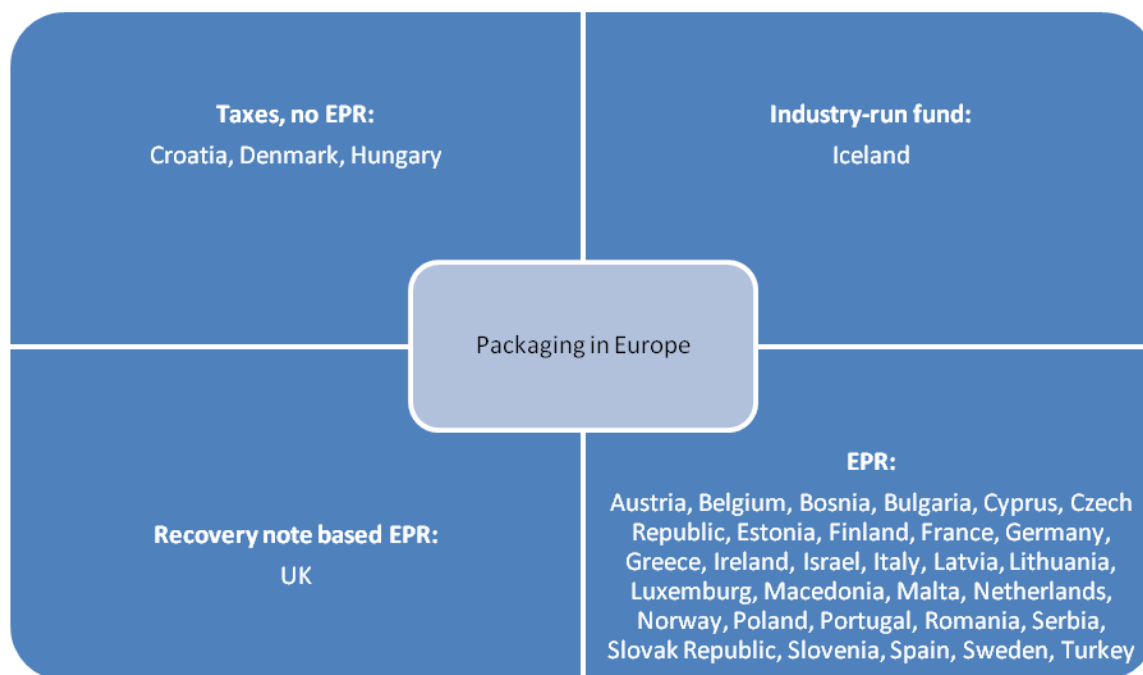


Figure 1-1: Approaches for addressing the packaging waste stream in Europe

Source: Based on data from EXPRA (2014)

Although EPR is an individual responsibility in theory, when it comes to packaging waste this is very often neither economical nor feasible in practice. This is why most producers join a collective organisation to which they contribute financially and which is in charge of meeting the legislative obligations on behalf of the parties responsible for compliance. In the expert literature such an organisation is known as “Producer Responsibility Organisation” (PRO). A range of further actors are often also implicated to varying degrees (public authorities, municipalities, consumers).

1.2 Problem definition

Despite some common features in the EPR policies for packaging (take-back requirement) and in the resulting practices (delegation of responsibilities to a PRO), the actual implementation of EPR differs considerably across the EU member states. On the other hand, while according to available statistics almost all member states have met the recycling and recovery targets set by the Packaging Directive, there are significant variations when it comes to their actual performance (BIO Intelligence Service, 2014).

In light of these differences – in policy design and performance – there is increased interest at the EU level in establishing a link between the two and in identifying EPR models that would boost waste management performances and would ultimately move EU closer to its resource efficiency objectives.

Two aspects in particular are subject to much debate in various countries.

The first one is related to the number of PROs in operation. In around half of the European countries, there are competing PROs (i.e. two or more PROs managing the same type of packaging), and in just as many countries there is only one organisation covering the defined

product segment (Figure 1-2). The latter situation means a de facto monopoly on the PRO level. In the EU and in the OECD countries, competition is generally favoured as it is seen to ensure the efficient working of markets and deliver important benefits to consumers. However, when it comes to EPR, it is situated in the area of waste management, where competition policy is intertwined with environmental goals. Questions then arise as to whether the classical economic arguments in favour of competition still hold true.

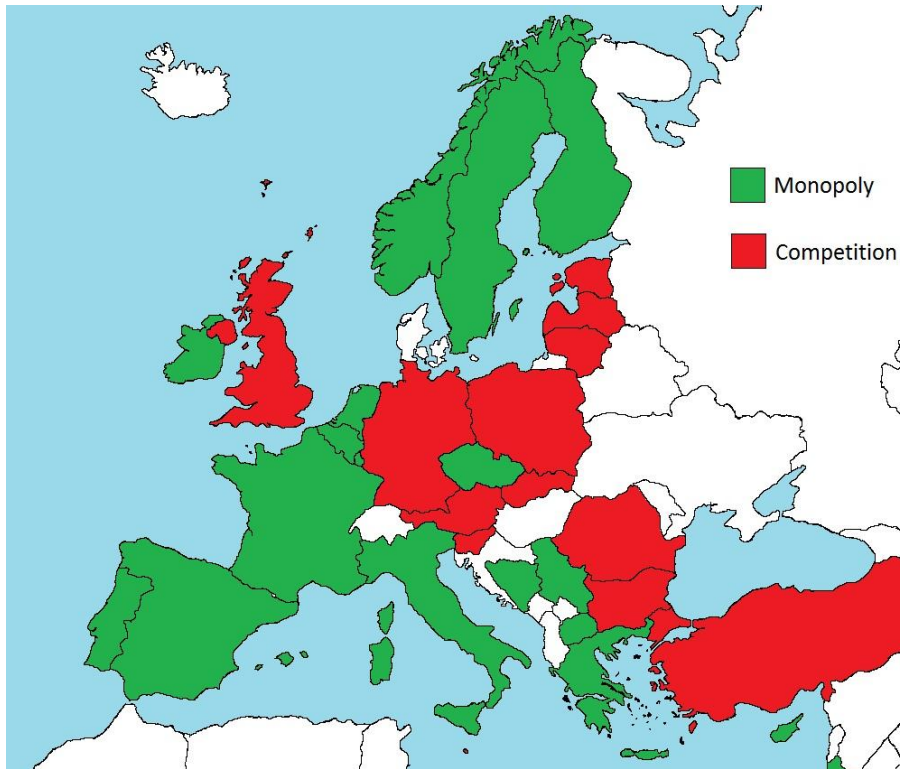


Figure 1-2: Monopolies vs competitive markets for European compliance schemes

Source: Based on information from Flanderka (2013)

The second aspect is linked to the allocation of responsibilities in an EPR system and more specifically to the role of municipalities or local authorities. EPR implies a shift of responsibilities from municipalities (who have traditionally been in charge of household waste management) to producers. In a number of countries there are political discussions whether municipalities should still be involved in the management of packaging waste and to what extent, and how roles between industry and municipalities should best be assigned.

Best and worst performing countries alike display different combinations of the two aspects and there is no consensus on what is the best approach. There are several countries in the process of changing and there is not one single pattern of these changes. In Germany a single PRO existed for more than a decade before competition was introduced and at present there are ten PROs in operation. However, there are debates on the performance of the current system, discussions about possible changes and even voices that it should be dismantled and other options should be considered instead (RecyclingNews, n.d.; VKU, 2013). At the same time, in Austria, competition among PROs is going to be introduced from 2015. In Finland, new waste legislation from 2013 extends producers' responsibilities to full and reduces the role of municipalities in packaging waste management (Cerniauskaite, 2013). In Sweden, as part of

the campaign for the elections in September 2014, the parties currently in opposition announced municipalities will take over the responsibility for collecting also packaging waste⁶ if these parties win the elections (Avfall Sverige, 2014). In a wider context, recent changes in Polish waste management law effectively place significant responsibility for managing the municipal solid waste system in the hands of municipal governments and the opposite change happened in Estonia. Although for the moment the latter two changes concern mixed household waste, it is not excluded that in the future they will also have an influence on waste affected by producer responsibility.

Even if there is extensive academic research in areas defining the context of the current research (competition as part of economic theory, waste management, recycling, EPR), it appears that the topic of competition among PROs and the role of municipalities have not been given explicit attention in academic literature.

1.3 Purpose and objectives of the research

The present study has the purpose of providing a better understanding of the implications of various policy designs in relation to the two aspects mentioned above: division of responsibilities between municipalities and industry, and competition on the PRO level. In view of the changes and discussions in several countries, it is helpful to get a better understanding of the effects of competition among PROs and whether such competition is beneficial and what roles should be played by municipalities under an EPR system.

Based on the purpose, the paper is analysing several EPR systems that display different combinations of the aspects in order to identify possible advantages and disadvantages of the various approaches. Instead of looking at countries that have the biggest problems in terms of performance, the approach is to focus on countries that are reaching best results. The idea of “learning from the best” is seen as useful. Three countries that are considered as high performers are taken as case-studies – Belgium, Germany and Austria. Their performance is measured both in terms of statistics and comes out as a general perception from debates in the field of EPR policies. Further, the EPR systems in the three countries combine the two aspects in different ways and thus provide good basis for drawing conclusions. The choice of the countries is discussed in more detail in Section 4.2.

In view of the stated purpose, the following research question has been posed and will serve as guidance to the research:

What are the implications of the (absence of) competition on the PRO level and involvement of municipalities in the EPR systems for household packaging waste in Belgium, Germany and Austria?

The purpose of the research is not to make a direct comparison between the systems in the different countries in order to grade them. This is judged as not appropriate due to several reasons. The following reasons can be noted in particular:

- Firstly, the countries have very specific historical, geographic, demographic and cultural characteristics which make a direct comparison inappropriate;

⁶ Swedish municipalities are responsible for collecting, transporting and ensuring proper treatment of waste generated within their jurisdiction by households and by businesses if it is comparable to municipal solid waste. In the case of waste affected by EPR, producers are responsible for collection and treatment of their respective waste (Steinwig, 2011).

- Secondly and very importantly, there does not seem to be a lot of information that is reliable enough: on the one hand, figures are not comparable as there is lack of harmonisation of definitions and calculation methods. Based on general EU guidelines, there are different national rules on what constitutes a packaging and different interpretations of recycling and recovery. On the other hand, often comprehensive and transparent information is not publicly available. This is especially the case in countries where there is competition among PROs since relevant information is regarded to some extent as confidential;
- Third consideration is that the systems under examination are dynamic and need time to develop. Often the system model and the actual implementation differ, and it would be of no use to compare systems that need fixes in terms of implementation and not design.

1.4 Scope and limitations

The study looks at EPR systems where producers financially support the implementation of collection and recycling schemes through the creation of one or several PROs. The research is undertaken from the perspective that PROs are created to play an intermediary role and as a way to organize the market. The implications of a situation where they are part of an organisation which is performing waste management activities itself (i.e. vertical integration) are not analysed. Other policy options adopted by European countries to achieve the targets in the Packaging Directive (such as taxes or tradable permit system) are not addressed. Issues excluded from the scope of the thesis are the presence and the effects of other economic instruments implemented in the countries. Parallel systems for managing packaging waste such as deposit-refund systems and other policies affecting general waste management practices (for instance economic incentives in the form of pay-as-you-throw schemes, landfill taxes, etc.) are therefore not analysed.

The focus is on a defined type of product - household packaging, which has a number of characteristics that make it distinct from other product types typically covered by EPR, and therefore it is not claimed that the findings are applicable to EPR systems for other products. Only three EU countries are chosen for the analysis – Belgium, Germany and Austria. Each one of them has specificities when compared to other European member states in terms of size, population, administrative structure, history and culture. It is attempted as much as possible to set aside these specificities and, when drawing conclusions, to determine the conditions under which they would be valid irrespective of the context.

As the developments are dynamic, particularly in Germany, the paper sets a chronological deadline and reflects the situation up to August 2014. The research analyses the design of the systems at present and, where relevant, takes into account historic developments that have influenced the current design. The perspective taken is to establish a possible link between current design and performance, instead of considering future scenarios or vision of how the whole system should look like in the future.

Information on the performance of the systems in the three countries is collected from personal interviews with relevant stakeholders. While the chosen stakeholders provide a wide overview of the relevant actors, a limitation in terms of representativity lies in the small number of individuals from each stakeholder group. The limitation is due to the fact that, for various reasons, interviews with several potential informants could not be arranged. Efforts were made to compensate for the limitation and ensure the quality and accuracy of the information provided, by looking also at written statements and other publicly available

sources where stakeholders have expressed opinions. Consumers are not regarded as separate stakeholder group. Several considerations for this decision can be mentioned. As private individuals are numerous and their view is conditioned by different factors, an attempt to gather and present a general view appeared impractical. Each of the determinant factors (such as culture, demographics, availability and convenience of collection infrastructure, consumer behaviour) is contextual and differs not only between the countries but also within them. Taking into account these factors would shift the focus of the thesis and was therefore not seen as adding to the objective of the study. Further, it is recognised that consumers are the actors whose participation is a prerequisite for the system to be successful. The research was therefore undertaken on the assumption that the consumer perspective is somehow already taken into account in the existing systems. Nonetheless, even though the consumer perspective is not explicitly sought, it is addressed insofar as it was raised by other stakeholders and insofar as these could link it to the two aspects under investigation – competition among PROs and involvement of municipalities. Such an approach ensured that the inclusion of the consumer perspective, despite it being indirect, remains relevant and contributes to the purpose of the research.

The interviews were predominantly held in English which is the working language of the paper. On several occasions interviews were conducted in French and German. As for the written sources, information in all three languages has been processed. In this respect, any errors or omissions when translating and interpreting information remain the responsibility of the author.

1.5 Audience and contribution

The main target group includes stakeholders involved in the current discussions about EPR programmes for packaging in EU member countries, for instance policy makers, local authorities, waste treatment industry and service providers. For those, the research aims to assist them in making their own conclusions by providing a better understanding of the consequences of various choices when designing an EPR system.

Practitioners involved in developing EPR schemes could get an insight as to what aspects are needed to make an EPR scheme successful and also what are the mistakes to be avoided. Policy makers, who are interested in implementing an EPR scheme, can use the information from the research to evaluate whether competition would be appropriate and how to create best conditions for it to achieve optimal outcomes, as well as to judge what role for municipalities would be suitable.

The contribution of the current thesis is further to provide a focused analysis of three EPR systems for packaging waste. As such, the thesis might be useful to anyone interested in the practical implementation of such systems and the existing relations and interactions between the stakeholders involved.

1.6 Structure

The first chapter presents the nature of the problem addressed in this research. Here, the purpose and the research questions are defined. Further, the chapter identifies research limitations, describes the audience for which this research may be useful and the intended contribution and provides a thesis outline.

In Chapter 2 the methodology used to approach the problem and answer the research question is described. It is explained how data was compiled and an analytical framework is developed which serves to structure the findings and perform the analysis.

Chapter 3 provides findings from a literature review on the role of PROs and municipalities in an EPR system. Based on theory, expected outcomes of competition are presented and are linked to the operation of PROs.

Chapter 4 aims to familiarise the reader with the waste management policy in the EU and to explain the choice of the countries selected for the case study.

Chapter 5 gives a comprehensive overview of the EPR systems for packaging in the three countries following the structure developed in Chapter 2. The approach is descriptive and the information serves to provide a background for the subsequent analysis and discussion of the three systems.

In Chapter 6 combined findings and analysis are outlined. Firstly, the similarities and differences in the design and functioning of the three systems are concisely explained. The perceptions of the different stakeholders are compiled and organised according to the framework outlined in Chapter 2.

On the basis of the findings and the analysis, key takeaways are outlined and presented in Chapter 7.

Finally, Chapter 8 summarises the main findings, highlights main research contributions and provides suggestions for further research.

2 Methodology

The purpose of this chapter is to present the way the research question was approached by describing the different steps of the research process.

2.1 Literature review

A literature review of academic articles and various reports was performed to provide a general background to the researched topic. The review also served to determine to what extent the problem identified in this thesis has been addressed in existing literature.

Although an extensive literature was identified in the area of EPR, it appears that to date very little research has been undertaken on the two specific aspects that are subject of the current thesis. The perspective of a producer responsibility organisation is analysed in Mayers (2007) and Mayers & Butler (2013). However, their research addresses the detailed operations of a PRO and does not deal with issues of competition.

A wider review has identified a recent consultancy report done for the European Commission as relevant. The report has focused on identifying best practices for the functioning of EPR systems with the view of developing guidelines for EPR (BIO by Deloitte, 2014). The report is covering a number of different waste streams and countries and identifies four key topics for an in-depth analysis: share of responsibilities among stakeholders, cost coverage, competition and transparency and control. With relation to the issue of competition on the PRO level, the study is inconclusive as to which situation is preferable. As regards the involvement of municipalities, the report outlines determining factors for the current setup and stresses that these differ across countries.

2.2 Data collection

Data collection is based both on desk research and stakeholder interviews. Input was sought from a number of actors involved or having an interest in the systems. Initial contacts with several stakeholders were established through the network of the International Institute for Industrial and Environmental Economics. Later on, additional stakeholders were contacted based on recommendations or references from people in the course of the interviews. An overview of the interviewees according to stakeholder group is presented in Figure 2-1. A complete list of the individuals interviewed and the organisations or institutions they represent can be found in Appendix II.

The selected stakeholders were initially contacted via email in which the purpose of the research and the expected contribution of the contacted person were explained. The actual interviews were mostly conducted in person (with those stakeholders based in Brussels or Vienna), by email (with the stakeholders based in Germany), or by telephone or Skype. The personal interviews did not follow a pre-defined questionnaire. Instead the questions were adapted according to the individual situation, allowing the stakeholders to freely express their opinion on the EPR systems in the three countries. These interviews typically lasted between forty minutes and one hour. The written interviews were structured, consisting of four to six open-ended questions covering the same aspects, but the formulation of each question was adapted to the stakeholder it was addressing. To ensure that information was understood correctly, permission was asked to come back to the interviewees in case of follow-up questions or subsequent need of clarification.

The objective of the interviews was to (i) establish an overall picture of how the systems function in practice, (ii) find out what do various stakeholders agree upon and when do they express critique, (iii) determine the arguments on which their views are based, and (iv) identify ideas for further improvement or fixes to the systems.

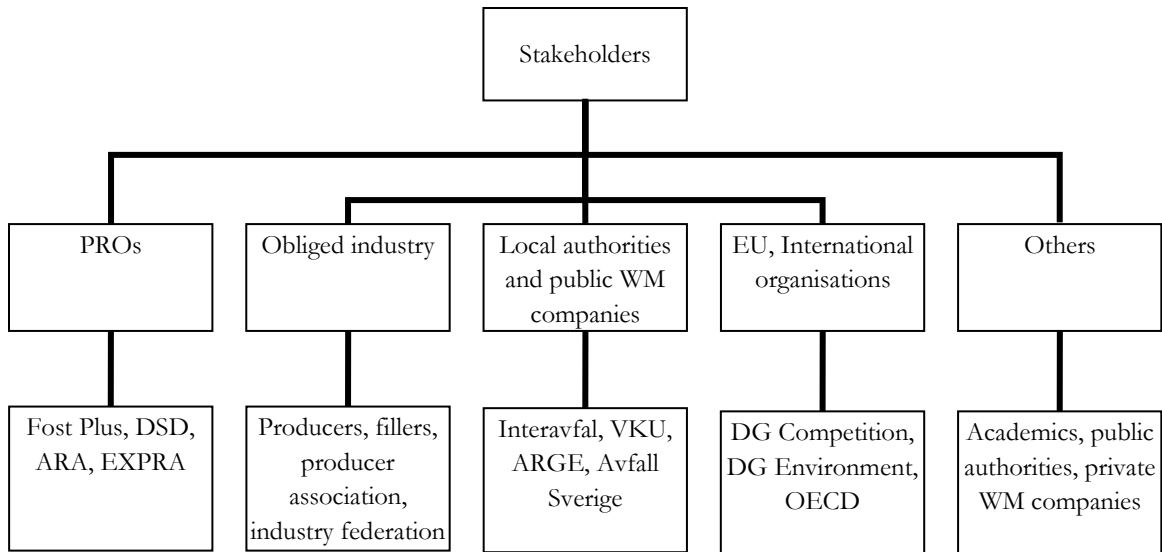


Figure 2-1: Stakeholder diagram

The selected national EPR systems are then profiled based on the information provided during the interviews, and complemented with information from other sources. The description of each system is organised under several headings and is presented using the following structure:

1. Legal basis, national targets and performance – the general requirements and targets set in the legislation are identified, as well as the scope (household/ commercial/ industrial) and the achieved performance
2. Actors, roles and responsibilities – an overview of the most important actors involved in the system is made; their responsibilities as defined in the legislation are presented and, where relevant, historical background is provided

After a brief description, the roles and responsibilities of the actors in the three EPR systems are systematically presented according to the framework presented in Table 2-1. Based on Lindhqvist (2000), three major types of responsibilities are identified: economic (covering the expenses); physical (organising the physical management of the packaging waste); informative (supplying information). The three types of responsibilities are combined with three main activities required under an EPR system. These activities are described in Tojo (2004) and are defined in the following way: collection and sorting of materials; recovery (including material recycling and energy recovery) and monitoring and enforcement. The resulting framework is employed to analyse whether the roles and responsibilities are clearly defined and whether there are possibly some inconsistencies.

Table 2-1: Allocation of responsibilities framework

	Collection	Recovery	Monitoring and enforcement
Economic	Who covers the costs for	Who covers the costs for	Who makes sure that the

	collection?	recovery? Who gets the revenues from the sale of recyclable revenues and what happens with those revenues?	obliged industry fulfils its financial obligations? Who fights against free-riders and what power does it have?
Physical	Who organises and who performs collection activities?	Who organises and who performs recovery activities?	Who makes sure that the waste is separately collected and effectively recycled?
Informative	Who has the obligation to report (and to whom) on the amount of waste collected and sorted? (1) Who has to inform and educate the general public about the importance of separate collection and how to do it right?	Who has the obligation to report (and to whom) on the amount of waste materially/ energetically recycled and recovered? (2)	Who makes sure that actors (1) and (2) provide the right information?

Source: Adapted from Lindbqvist (2000) and Tojo (2004)

- As a final element of the description, an overview of how the system functions is provided, including the type of fractions that are separately collected and the way they are collected. In the case of competing systems it is explained how they divide the tasks and collected materials for further treatment.

2.3 Data analysis

The current study is not performing a formal comparison of the systems in order to grade them. Instead it analyses in parallel the experiences with different setups and aims to identify consequences of various choices from which lessons can be drawn.

For the analysis, a set of criteria was chosen among several existing multi-criteria evaluation frameworks. The selected criteria are seen to cover well the most important issues raised in the discussions around the functioning of EPR systems for packaging. The choice of criteria is based largely on impressions gathered during the literature review and the conducted interviews, as well as from what was identified as relevant by the author from previous research in the area. For each criterion, it is looked at how stakeholders perceive the overall functioning of the system in relation to the criterion. When appropriate, perceptions are combined with hard figures. Subsequently it is analysed what elements of the system contribute to the perceived performance for each criterion. Elements related to the two aspects that are focus of the study (competition and role of municipalities) are analysed in particular. On the basis of this multi-criteria analysis, conclusions relating to the possible advantages and disadvantages of the three systems are drawn.

While many mainstream evaluation concepts are also relevant for evaluating environmental policies, there are special characteristics to environmental problems which should be given due consideration (Mickwitz, 2003). This is why for the selection of criteria exclusively literature on evaluation of environmental policies was reviewed. The framework presented in Mickwitz (2003) provides general criteria for the evaluation of environmental policy instruments. Mundaca & Neij (2009) develop and apply multi-criteria framework to a specific instrument. OECD has extensive experience with implementation and evaluation of environmental policies. OECD reports are reviewed which establish criteria for evaluating economic instruments for environmental policy (1997), discuss criteria for evaluation of EPR policies in view of adjusting them (2001), and offer a framework for evaluating costs and

benefits of EPR schemes (2005). Several criteria were derived from the literature review and adapted to the current study.

To begin with, the first criterion selected is effectiveness. It is addressed in all of the reviewed sources mentioned above. Effectiveness relates to whether and how successful the policy instrument is in achieving the goals. Here, the goals set in the legislation are taken as a reference point. As the focus of the paper is on two specific aspects of the EPR systems for packaging (competition among PROs and role of municipalities), it is attempted as much as possible to identify to what extent stakeholders attribute the perceived success or failure to the two aspects.

Achieving a policy goal implies a certain level of economic costs and it therefore appears relevant to look at efficiency. The definition given for this criterion in Mickwitz (2003) questions whether the results justify the resources or, in an alternative formulation, whether the targets have been achieved at the lowest possible cost. Such a definition seems most suitable for drawing a parallel between the situations of having monopoly as opposed to having competition on the PRO level. For the context that is subject of analysis, i.e. EPR systems for managing packaging waste, efficiency is associated with the licence fees paid by the producers to the PRO(s) and with the costs of waste management operations.

However, account must also be taken of costs necessary for devising and implementing the system. These are typically related to resources devoted to activities such as monitoring and enforcement. For the analysed context, they might additionally relate to, for instance, the costs incurred by obliged companies in order to assess offers by different PROs and to switch between them, or to negotiation costs that different parties incur. Mundaca & Neij (2009) present two criteria that correspond to this type of costs. These are transaction costs (costs other than investment and administrative cost faced by market actors initiating and completing transactions) and administrative burden (workload that public authorities face when the policy instrument is implemented and enforced). These will be addressed in terms of sources and, where possible, scale.

The performance of a policy instrument can also be assessed on the basis of how transparent it is. Mickwitz (2003) notes that some aspects might be very transparent but not others. Sometimes the impacts and thus the effectiveness of an instrument can be affected by the level of transparency. This criterion can be defined by the degree to which processes are observable to outsiders, i.e. to actors who might not be directly involved in the activities and operations, but are often affected by the outcomes. In EPR systems, such actors might be citizens, who do not have an influence on the setup of the system, but are led to participate in it; municipalities in the instances where they do not perform collection activities for packaging waste, but are still affected by the presence of the packaging waste bin next to the one for mixed municipal waste for which they are responsible, etc.

Finally, the need was seen to have a criterion under which any additional issues raised by the stakeholders can be fitted. These might include possible effects on attitudes and awareness, equity and distributional effects, dynamic effects and innovation, etc.

As mentioned before, the criteria will be used to analyse the advantages and disadvantages of the different systems in relation to the two aspects, instead of trying to perform a regular evaluation in order to grade the systems. It is not attempted to conduct a systematic quantitative or qualitative analysis, but to use the criteria to structure the opinions expressed by the different stakeholders. Therefore, the criteria will be interpreted mostly as they are

viewed and understood by the different stakeholders rather than according to their precise definition. For the analysis, it seems appropriate to group the criteria in the following way:

- Effectiveness and efficiency: to what degree the stakeholders perceive the system to be successful and the associated costs to be reasonable.
- Transaction costs and administrative burden: how stakeholders judge the efforts needed for the system to function.
- Transparency and other effects: whether the information that is publicly available is perceived as enough. Here any other issues raised up during the interviews are mentioned.

The issue of free-riders is mentioned on several occasions. Where it affects the success of the system, it is dealt with as part of the first point. If it results in increased efforts to control and sanction illegal behaviour, it is addressed as part of the second point.

3 Literature review and definitions

The purpose of the current chapter is to provide a theoretical grounding for the thesis. The chapter clarifies and defines the term of PRO, explains why such organisation is generally established and gives an overview of its main activities. A review of the academic literature is performed in order to identify reasons for municipalities to get involved under an EPR system. Further set of economic and competition law literature is reviewed in order to identify some widely expected effects of competition. Subsequently it is attempted to link those to the area of waste management and the functioning of a PRO. The rationale is to build on the general prerequisites for competition to function in order to identify whether these are supported in practice in the area of EPR.

3.1 Concept of PRO

Both Lindhqvist (2000) and Tojo (2004) have performed extensive research on the concept of EPR. They give the following definition of Producer Responsibility Organisations (PROs): organisations that “carry out and coordinate the fulfilment of the responsibility of producers” (Tojo, 2004, p. 190) by being responsible for the “every-day work necessary for the system to function” (Lindhqvist, 2000, p. 59). The recent study on developing guidance on EPR defines a PRO as “a collective entity set up by producers or through legislation, which becomes responsible for meeting the recovery and recycling obligations of the individual producers” (BIO by Deloitte, 2014). The abbreviation PRO is sometimes interpreted as Packaging Recovery Organisation, for instance by the umbrella organisation of national producer responsibility systems engaged in the selective collection and recycling of packaging waste (PRO Europe, n.d.).

One of the reasons for establishing a common organisation is to reduce transaction costs for the affected parties (producers, consumers, local authorities) and make EPR more practicable. In the case of packaging this is especially relevant as the product is rather simple, has a short lifespan and the number of producers is high. What a PRO usually does in practice, is that it collects financial contributions (licence fees) from the parties responsible for compliance, and uses these to finance activities needed to achieve the targets prescribed by legislation. These activities include separate collection, sorting of collected waste, recycling and recovery. In addition, a PRO can perform further activities, for instance communication campaigns or audits of contracting parties or waste management operators. The financial contributions of obliged companies also serve to cover costs related to the running of the PRO. A schematic overview of the activities performed by PROs and associated costs that they incur is presented in Figure 3-1.

Irrespective of the range of activities and the type of PRO (public, private, not-for-profit), the majority of the costs it incurs are associated with operational waste management costs. These are costs for collection, sorting and recycling, including intermediate transport. As capital-intensive infrastructure is needed to perform these activities, the costs are mostly fixed and independent of the amount of waste collected and treated (C. Stiglitz, personal communication). In Belgium for 2013, the expenses for operational waste management amounted to 82% of the total costs (C. Delatter, personal communication). For the German context, the operational costs can amount to more than 90% of total costs (Bundeskartellamt, 2012). In turn, collection costs represent a significant portion of total costs while the costs for sorting and recovery operations can be quite low (T. Lindhqvist, personal communication). Separate from the operational costs related to the abovementioned activities are system-management costs, predominantly consisting of salaries of the personnel employed at each

PRO. In Austria, these administrative costs usually represent around 2% of the total costs (C. Stiglitz, personal communication). For Germany, they amounted to around 4% in 2003 just before the first competing PRO entered the market, and today, it is calculated that the administrative costs together with profit margins for PROs approximate 12% (Bundeskartellamt, 2012). In Belgium for 2013, 8% of the total costs were needed to cover system management expenses and 10% were allocated for activities on communication and prevention, fees for the regional government and aspects on quality control (C. Delatter, personal communication).

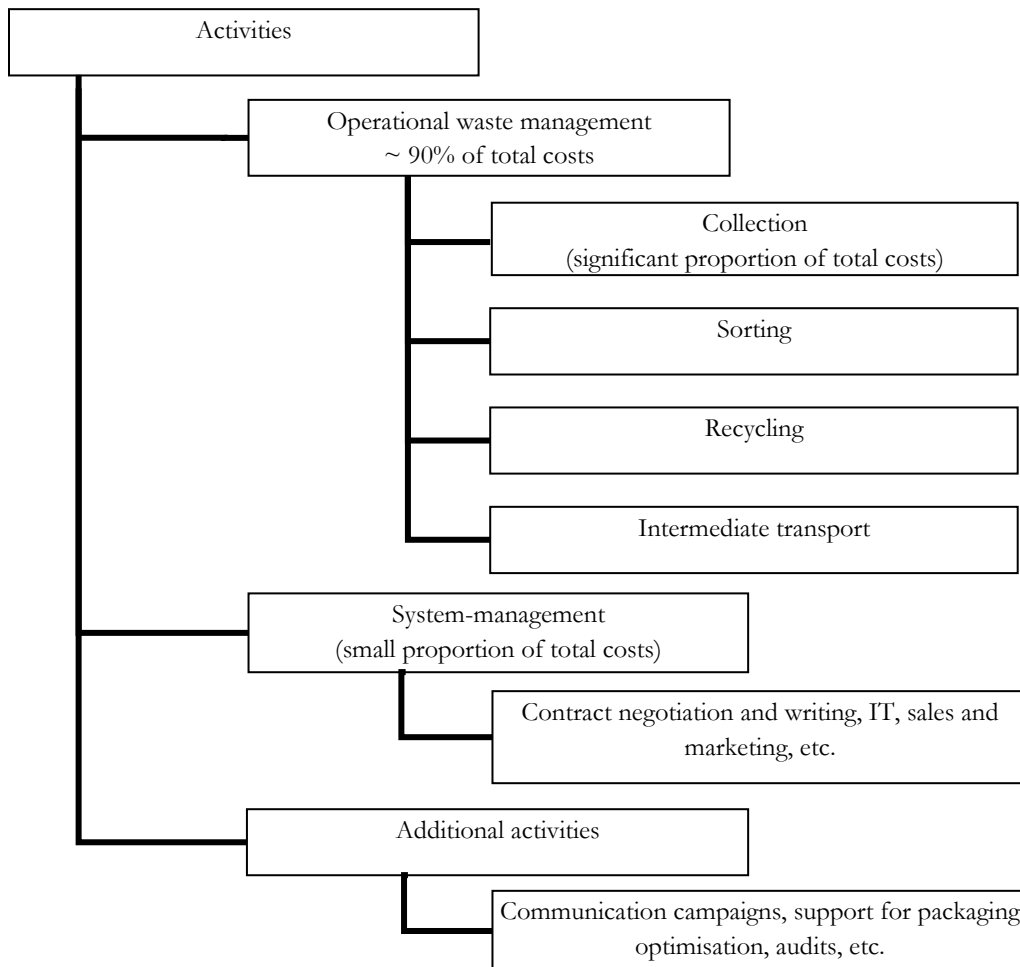


Figure 3-1: Activities and costs of a PRO

3.2 Role for municipalities in an EPR system

In Europe, municipalities have traditionally taken care of household waste. The introduction of an EPR system under the European Packaging Directive implies a shift of these established waste management tasks to producers who themselves become responsible for managing packaging waste. Such a responsibility can be only economic (in the case where collection infrastructure, previously financed through taxpayer contributions is now financed by producers) or also physical (when producers are responsible for the physical organisation of the packaging waste treatment either individually or through a PRO). Such a shift of responsibility from producers to municipalities can be full or partial.

In spite of producers taking on tasks previously associated with municipalities, there are still a number of reasons for municipalities to be involved, in particular at the stage of waste collection. Research by Tyson (2005) suggests three principal rationales for municipal role under EPR systems: coordination of producer responsibility with municipal systems, environmental performance expectations and scale economy arguments.

Firstly, municipalities might want to ensure coordinated delivery of waste management service. Coordination would equally open up possibilities for the collection of non-packaging metal and plastic waste together with packaging waste in cases where such joint collection is seen as beneficial⁷. Coordination is also seen as affecting positively the decision of citizens to sort packaging waste as they then interact with a single system for waste management. Citizens usually perceive household waste collection as a municipal task and consequently address their complaints to municipalities. Under such circumstances municipalities would want to be able to influence a system for which they are seen as being responsible in the eyes of the citizens. This argument is especially valid in cases where municipalities feel they lack tools to regulate the local collection service provided by producers.

Secondly, there is sometimes the perception that public authorities act in the public interest and are, therefore, capable of delivering higher environmental performance (which might be compromised by profit motives of private actors). In cases where source separation infrastructure and treatment facilities pre-date the emergence of producer responsibility, municipalities are seeking to protect their (sometimes quite significant) investments and the public's trust by continuing to operate the local collection system.

Thirdly, there might be opportunities to achieve scale economies by sharing overhead costs when managing both producer responsibility materials and other type of municipal waste.

Finally, research by Tojo & Hansson (2002) highlights that there might be purely political reasons, such as the aspiration to secure their own employment and retain control of the system.

Cahill et al. (2011) have analysed several case studies of EPR implementation for packaging waste in the EU. Their research seems to suggest that in countries where local authorities have been involved in the design and implementation of EPR systems for packaging, results have been "significantly more positive" than in cases where their involvement has been limited, although the meaning of "positive" is not explicitly defined. The authors recognise that national EPR systems vary widely in terms of design, targets, priorities and that there are other issues to be considered as well such as perceptions on the legitimacy of local authorities as stakeholders in producer responsibility systems and fear on the part of producers of increased costs (Cahill et al., 2011).

On the other hand, municipalities might be reluctant to get involved if they want to avoid the burden of handling waste that requires costly treatment (Tojo & Hansson, 2002). Further, if municipalities have weak bargaining power against producers, the latter might impose unfair terms of trade (Massarutto, 2014) or use the political pressure on municipalities to deliver quality results to pass on some of the costs of the producer responsibility system (Tyson, 2005).

⁷ There are differing opinions whether a joint collection of packaging and non-packaging material of similar composition is a good idea. In cases where the decision is taken to perform a joint collection, involvement of municipalities is seen as beneficial.

3.3 Competition

Neo-classical economic theory plays an important role in competition policy. It holds that consumer welfare, and society more broadly, is better off when a state of perfect competition exists in a market. According to economic theory, specific conditions have to be fulfilled in order for perfect competition to take place. The product on which firms are competing must be “homogenous”, that is, of the same type or even identical; there must be an infinite number of buyers and sellers; free entry and exit to the market must be possible; and consumers should have access to full information allowing them to make rational choices.⁸

Under these prerequisites, theory predicts that perfectly competitive markets will result in both “allocative” and “productive” efficiency.

When producers are infinite, each one individually does not have an influence on the aggregate output. At the same time the aggregate output and consumer demand determine the price (according to the economic law of supply and demand). As a result, producers are “price-takers” and only consumer demand determines how resources are allocated. This is when the most efficient allocation of resources is achieved and, thus, allocative efficiency is attained. In the case of a monopoly, a single producer controls the market and theory suggests that he will decrease the output in order to increase his profits. Resources would then be misallocated.

In the state of perfect competition, each producer has further the incentive and the competitive pressure to keep down production costs. Consequently, goods will be produced using the fewest resources possible and productive efficiency will be achieved.

It is recognised that the state of perfect competition is an abstract model and rare to happen in practice because its prerequisites are unlikely to be met simultaneously. Nevertheless, the theory gives an indication as to what the potential advantages of competition are and what are the mechanisms for these advantages to work. This gives grounding for public authorities to encourage and protect (actual and potential) competition on a market without necessarily being able to secure all the requirements of perfect competition. As a result, elaborate competition policies are developed both on national and European level.

Because of the prediction of allocative and productive efficiency and the assumption that under competitive pressure producers will strive to respond to and attract consumer demand, competition is generally praised for its lower prices, wider choice for consumers through differentiation and greater variety of products and services, improved quality and positive effect on innovation (European Commission, 2012; OECD, n.d.-b). Waste management is recognised as being an area for which it is recognised that there is a limited number of actors and competition is not always easy to secure (DG Competition, 2005; OECD, n.d.-a).

With respect to competition between PROs, there are generally three main levels through which competitive differentiation in terms of costs and, possibly, quality can be achieved. These are (i) organisation of compliance/ internal operations of PROs; (ii) collection and sorting of packaging waste; and (iii) recovery and marketing of materials.

The first level consists of activities needed to run the system (sales and marketing, IT, external communication, contract negotiation for collection/sorting and recovery/marketing of materials, etc.) and related costs (Bundeskartellamt, 2012). These activities are commonly

⁸ The theory presented in this section is in line with Rodger & MacCulloch (2001).

performed by white-collar employees, and thus, the internal costs predominantly consist of salaries of the personnel employed at each PRO.

As regards the second level, collection and sorting of household packaging waste is subject to specificities which often renders the duplication of existing household collection infrastructure economically not viable (DG Competition, 2005). This is why shared use of the collection infrastructure is promoted and exclusive arrangements between collection operators and one PRO are forbidden (DG Competition, 2005). As Mayers (2007) notes, waste collection requires a degree of central coordination. If there are competing PROs, they have to find agreement and establish a common framework so as to allocate waste collection responsibilities equitably, i.e. proportionately to the combined members' producer take-back obligations for each PRO (Mayers, 2007).

For the third level – of recovery and marketing of material, if PROs are owners of collected material, they would be able to market it freely. The quality and value of the separated material would then be determinant for a competitive price. The quantity of material might also play a role, with bigger quantity getting a preferential price.

Overall, the combination of the three levels will shape the competitive advantage of each PRO. The presence of multiple PROs ensures choices for obliged companies, given that PROs are able to exploit the three levels and provide a differentiated service, in terms of price and/or quantity.

4 The EU context

4.1 Waste management policy in the EU

The cornerstone of the EU waste management policy is the Waste Framework Directive⁹. The Directive introduces a five-step “waste hierarchy” where prevention is the best option, followed by re-use, recycling and other forms of recovery. Disposal such as landfill are to be considered as the last resort. EU waste legislation aims to move waste management up the waste hierarchy.

The Waste Framework Directive is the overarching piece of waste legislation, under which the Packaging Directive is placed. The Directive has to be transposed in national legislation and sets targets to member states to achieve a minimum rate of 55% for recycling and 60% for recovery (including incineration with energy recovery). Material-specific targets for recycling have also been set: for glass 60%; paper and cardboard 60%; metal 50%; and plastics 22.5% (Packaging Directive, Article 6)¹⁰. The Directive does not contain differentiated provisions for household, commercial and industrial packaging waste, but sets global targets and leaves it to the member states to decide how to reach those.

The targets in the Packaging Directive were set to be achieved by 2008 (with a later deadline for the new member states). Currently, both the Waste Framework Directive and the Packaging Directive are under revision with the aim to set new ambitious targets and to add further provisions on the instruments to achieve and to monitor them (European Commission, 2014).

4.2 Selection of the case studies

Three countries are seen as interesting for the thesis – Belgium, Germany and Austria. Apart from what statistics suggest in terms of their performance, these are countries that have well developed EPR systems for managing household waste and are also widely cited in that respect. This impression was confirmed during a research performed previously by the author as part of a course work. During the earlier study, the author received recommendations on the three countries from experts having an overview of the wider European context. What is also interesting in view of the current study is that the three countries differ in terms of the two aspects under analysis (competition among PROs and involvement of municipalities) and in that respect have the potential to provide a good basis for drawing conclusions.

Further, a parallel analysis is facilitated by the fact that in these three countries producers clearly cover the full cost of waste management activities related to the treatment of packaging waste¹¹, for the rest of the countries it is not clear whether there is full cost coverage on the part of producers (BIO Intelligence Service, 2012b).

⁹ European Parliament and Council Directive 2008/98/EC of 19 November 2008 on waste and repealing certain Directives, OJ L312/3 of 22.11.2008.

¹⁰ Material-specific targets were set to insure that the countries will not seek to achieve the overall targets only by focusing on materials that are easy to recycle but would adopt a comprehensive approach.

¹¹ This is also the case in Finland after the implementation of the new waste law in 2013.

When observing the data provided by Eurostat (the statistical office of the EU), wide variation in performance of the EU member states in relation to managing the overall packaging waste stream can be observed (see Figure 4-1).

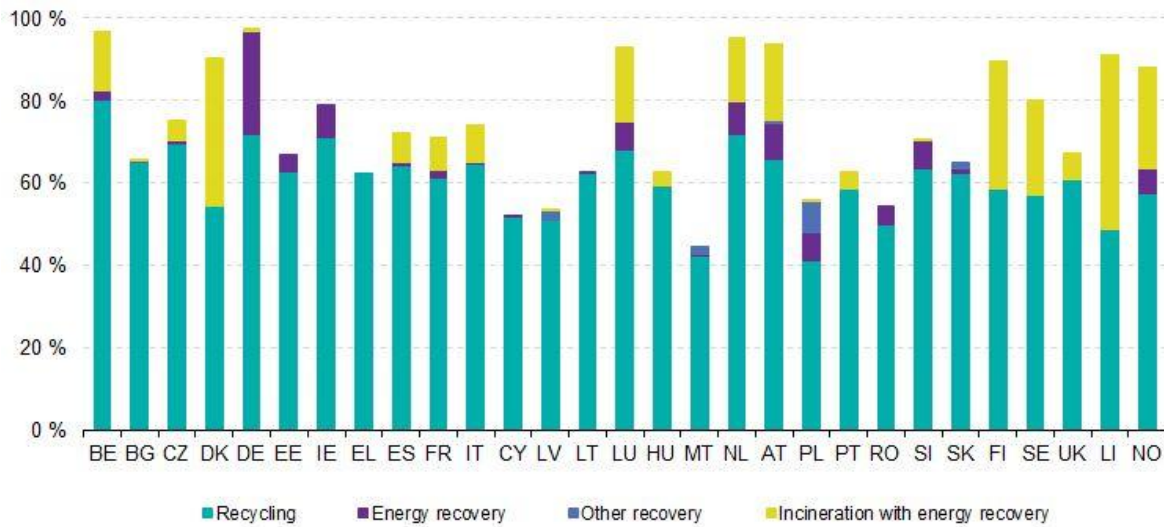


Figure 4-1: Share of treatment for overall packaging waste for 2011

Source: Eurostat (2013)

The figure shows that the three selected countries are among the ones reaching the highest results. There are other countries that also stand out as high performers, although, as it often happens, statistics are difficult to interpret. For instance, from the graph it appears that the yellow part stands for energy recovery of packaging found in mixed waste, which is not seen as pertinent for the analysis, as incineration would happen irrespective of the system in place. For several countries (Denmark in particular, but also Finland), the yellow part would give the impression of excellent waste management performance where in fact incineration of mixed waste accounts for a significant proportion of recovery percentages. At the same time, Sweden, which is known for the importance of incineration in its mix of waste management solutions, should reach recovery rates of close to 100%, which is not the case according to the graph.

If the yellow part which is difficult to interpret is ignored, a few more countries can be discussed. Netherlands has just recently (in 2013) changed its approach from environmental tax to EPR and the timeframe from 2013 would be rather insufficient to draw meaningful conclusions based on the short experience. Luxembourg is seen as an inappropriate case study because of its small size and relative importance of cross-border trade in packaged goods, which has the potential to affect statistics considerably. The figures for Ireland are difficult to be explained, as the country is not cited of doing especially well in the area and no information supporting its performance could be found.

It can again be highlighted that the graph aggregates information for both household and commercial & industrial household waste and, as discussed, the interpretation of statistics does not always offer a straightforward representation of reality. The selection of the three countries as a focus for the thesis came to a large extent as a result of comments and references to their performance by experts in the field.

5 Description of the systems

In this part the EPR systems for household packaging in Belgium, Germany and Austria are profiled based on information from the conducted interviews and desktop research. The presented information is factual and follows the structure described in Section 2.2. The approach in this chapter is descriptive, analysis, discussion and reflection on the information found here is presented in the following two chapters. The purpose of the present chapter is to give a concise overview of the three producer responsibility systems and to provide a basis for analysing the implications of the different policy designs in relation to the presence or absence of competition on the PRO level and the role of the municipalities.

5.1 Belgium

Legal basis, national targets and performance

Belgium is a federal state, comprising three regions (Wallonia, Flanders, Brussels-Capital). Waste management is competence of the regions, but in 1996 a Cooperation agreement¹² with the statute and force of law was signed between the three regions to ensure that compliance with the European Packaging Directive is the same nationally. A new version of the agreement came into force in 2009. A public institution – the Interregional Packaging Commission (IVCIE) – was set up jointly by the three regional governments to ensure a harmonised management of packaging waste and to monitor the system.

The Cooperation Agreement in place obliges every company that puts packaged products on the Belgian market to take back the used packaging and achieve specific recycling and recovery targets. Producers can opt for an individual solution or set up an accredited body, which takes over their legal responsibilities. These accredited organisations have to be not-for-profit, have to cover the totality of the country in a homogeneous way and are subject to strict government control. Belgium has two accredited organisations – one for household packaging waste (Fost Plus) and one for industrial packaging waste (Val-I-Pac). The accredited compliance organisation for household packaging waste is required to calculate the contributions of its contracting parties so as to cover the full cost of collection, sorting and recycling up to the recycling targets that have to be met, as well as costs for communication and public awareness campaigns (Cooperation Agreement, Art. 13, §1, para.1). Municipalities are responsible for collection, and if more than 20% of collected packaging waste is residue (i.e. waste that should not be collected separately with packaging waste but should be thrown together with the mixed waste instead), then they have to cover the costs for treating the residue. Otherwise, if it is less than 20%, then it is Fost Plus that is responsible for treating the residue.

The fundamental principles of the Agreement are the following:

- Take-back obligation, i.e. the obligation to reach the targets of:
 - 80% recycling and 90% recovery overall (recovery can include incineration with energy recovery)¹³;

¹² Accord de coopération du 30 mai 1996 concernant la prévention et la gestion des déchets d'emballages

¹³ The global percentages are calculated in relation to the weight of all packaging material put by all producers on the Belgian market.

- 15 to 60% of minimal recycling according to packaging material¹⁴ (outlined in Table 5-1);

Table 5-1: Belgian national targets for household packaging waste

Material	Paper/ Cardboard	Drink cartons	Glass	Metals	Plastics ¹⁵
Recycling target (by weight)	60%	60%	60%	50%	30%

Source: Cooperation Agreement, Article 3

- Information obligation, i.e. the obligation to report each year to the IVCIE the quantities of packaging put on the market and the way they are recycled/ recovered. Obligated companies have to report to the IVCIE directly if they have chosen individual compliance and through the accredited organisation otherwise.
- Companies who put at least 300 tonnes of one-way packaging on the Belgian market are required to submit a general packaging waste prevention plan every three years.

Further, the Belgian packaging waste legislation¹⁶ makes a distinction between household and industrial packaging waste. The approach for the two waste streams is different, and environmental targets have to be met for each waste streams separately. This obliges producers to take measures for both industrial and household packaging waste.

Total recycling figures are calculated in relation to the amount of one-way and reusable¹⁷ packaging placed on the Belgian market. The recycling and recovery percentages for one-way packaging waste include reported figures from the accredited organisations and by companies complying individually. The performance for the last years has been higher than the national targets (Table 5-2). For some materials the percentage can reach up to 100%. For the paper/ cardboard fraction this is partly due to the fact that households throw away separately also packaging that cannot be considered as “household” according to the legal definition, while at the same time, the estimated share of packaging in the household waste bin is fixed at 25%. For glass and metals there is as well the effect of “parallel imports” – packaging that was not put in circulation on the Belgian market but instead was imported from neighbouring countries.

¹⁴ The material-specific recycling percentages should be achieved as a ratio to the total packaging of the particular material. The target of 15% applies to wood.

¹⁵ The provisions are for mechanical recycling only, other forms are to be counted separately (chemical, incineration with energy recovery).

¹⁶ The law also sets a minimum quota for refillable packaging.

¹⁷ Reusable packaging placed on the Belgian market for the first time.

Table 5-2: Belgian performance for household and for total packaging¹⁸

	Household (Fost Plus)	Overall (household and industrial)
Recycling rate (all materials)	82.9%	80.3%
Recovery rate (all materials)	91.2%	97%

Source: IVCIE (2014)

Actors, roles and responsibilities

- Obligated industry

The following three types of actors have specific obligations with regards to household packaging provided that the quantity of packaging each one places on the Belgian market is at least 300 kg: packers/ fillers, importers and producers of service packaging. They can meet the take-back obligation individually in which case they have to report to the IVCIE the way in which they are fulfilling it and have it approved. Individual responsibility is rare for household packaging and it is typically chosen by few producers who sell directly to the end user and take back packaging on delivery. The alternative option is that obliged industry appoints an accredited compliance organisation to carry out the take-back obligation. In that case, obliged companies have to only notify the IVCIE of their choice, but it is the PRO that has to supply information for each of its contracting parties (Cooperation Agreement, Art. 18).

From the very beginnings of Fost Plus there was genuine commitment on the side of the industry as they did not want to escape the legislation, but to cooperate and fulfil it. Both producers and distributors displayed great will for constructive collaboration (P. Diercxsens, personal communication). This is how from the outset, industry is not only financing the system, but is highly involved in the management of Fost Plus. If they are not satisfied with it, they would be capable of changing it (F. Van Tiggelen, personal communication).

- PRO – Fost Plus

Fost Plus was created in 1994 by Belgian industry – large and small companies from the three sectors of retail, food&drink and detergents&cosmetics, and producers of packaging and packaging materials. Soon after its creation, other large companies and SMEs joined the system and in 2013 Fost Plus had around 5200 members, representing around 93% of the Belgian market (Fost Plus, 2014).

The legislation does not state that there can be only one PRO, but sets clear rules and stringent obligations for such organisations. Fost Plus is required to be a not-for-profit organisation by law and to have as a sole statutory aim the assumption of the take-back obligation on behalf of its contracting members (Cooperation Agreement, Art. 9). Fost Plus has a governance structure similar to that of a profit-making company, allowing the obliged

¹⁸ The total recovery figures contain estimates from packaging found in the mixed waste, unlike the recycling figures. The recovery figures for Fost Plus are measured figures, based mostly on selectively collected material, and not estimates (M. Adams, personal communication). The method for calculating recycling and recovery rates will be elaborated in more details in Section 6.1. For cardboard and glass Fost Plus typically reports high numbers (over 100%) which have the potential to influence the overall performance. A reason for reporting such high numbers are possible differences between quantities of packaging "put on the market" (i.e. those that are registered with Fost Plus) and those effectively "collected". The latter often exceeds the first because of various reasons (packaging from companies not subject to the legislation because of small quantities of packaging they put on the market, free riders, packaging registered as industrial but collected through the household waste system).

industry to be highly involved in the overall organisation. Representatives of the three consumer goods sectors that were at the origins of Fost Plus, as well as representatives of the packaging producer industry are present in the different statutory bodies (such as in the Board of Directors, Remuneration Committee, Audit Committee, in different working groups). Waste management companies, however, are not involved in the governance to avoid conflicts of interest. A choice in the beginning was that the authorities would not take part – they would set the targets and regulate, but industry would be free to decide how to achieve them (F. Van Tiggelen, personal communication).

For the twenty years since its creation, the Fost Plus staff has developed expertise and has established the routine contacts needed for the organisation to function (to competent regional authorities, recyclers, etc.). The industry counts on Fost Plus for their expertise and holds it accountable through regular reports to the Board of Directors. Industry is only involved directly in the preparation of a new agreement or when some politics are at stake (F. Van Tiggelen, personal communication).

Fost Plus is also involved in several ways in communication campaigns aimed at the general public and in prevention initiatives. On a national scale, Fost Plus contributes to big campaigns of awareness-raising where a universal message is most commonly transmitted via TV, radio spots and posters. Apart from this, Fost Plus has to pay 0.50 € per inhabitant each year for campaigns targeting waste prevention in specific. The budget of nearly 6.5 mln € is co-managed with the regions and is spent on campaigns with a regional focus, including campaigns against littering. Finally, the accreditation agreement contains specific provisions for local communication. The yearly budget of 0.28 € per inhabitant is managed in partnership with intermunicipalities (i.e. groupings of municipalities, see below) and includes sorting calendars distributed to the households.

Fost Plus is accredited for a five-year term by submitting an accreditation dossier to the IVCIE which consults all relevant stakeholders and takes a unilateral decision of approval or rejection.

- Interregional Packaging Commission (IVCIE)¹⁹

The IVCIE is a joint institute of the three Belgian regions and ensures compliance with the Cooperation Agreement. It has a double structure consisting of a decision-making body (DMB) and a Permanent Secretariat, whose role is to assist the decision-making body. The DMB is composed of political representatives and representatives of the waste administrations of each of the three regions. The Permanent Secretariat is composed of civil servants and members of staff who are placed at the disposal of the IRPC by each regional government to perform its administrative and technical tasks.

The Commission has several missions. It grants or refuses to grant accreditation to the PRO(s) and audits the activities of the already accredited PRO(s) for satisfactory functional performance. If need be, it may suspend or revoke their certificate. The IVCIE also monitors the way in which obliged parties (producers individually or through the accredited PRO) meet the statutory targets for recycling and recovery of packaging waste and ensures the correctness of the data provided. Further, IVCIE is the body responsible for sanctioning free-riders.

¹⁹ Largely based on information provided by Mr Marc Adams, IVCIE.

- (Inter)municipalities and public waste management companies

Municipalities are legally and solely responsible for the separate collection and sorting of household packaging waste. They can undertake the collection and sorting either themselves or contract out to private waste management companies.

By law, Fost Plus has the obligation to sign agreements with all municipalities, covering the whole territory of the country. Municipalities in Belgium are numerous (a bit less than 600) and small, but have grouped together into larger intermunicipal entities (“intermunicipalities”), so that only around 40 contracts have to be signed between the parties (Y. Slutzky, personal communication).

The accreditation of Fost Plus holds information and rules on how to finance the collection in case it is performed by the intermunicipalities themselves. Questions such as “what collection systems are accepted and will be financed”, “what in case of a deviating collection system”, “which supplementary compensations are to be given by Fost Plus to intermunicipalities (e.g. cost of communication)” are specifically addressed. On the basis of the accreditation, a standard contract is worked out that can be used in the mutual cooperation between Fost Plus and the intermunicipalities (C. Delatter, personal communication). Reimbursement of local authorities for operational costs is based on the market price and reflects the execution of a qualitative service (Fost Plus, 2011).

- Private waste management companies

Collection and sorting services can alternatively be contracted out to private waste management companies. Sorting is typically performed by public waste management companies in the region of Wallonia and Brussels-Capital, and by private waste management companies in Flanders (Y. Slutzky, personal communication). This is done through a public tender procedure where both the intermunicipalities and Fost Plus choose the contractor.

Procedure similar to a public tendering also applies to recycling services whereby Fost Plus contracts with recyclers directly and receives the revenues from selling sorted packaging waste.

Table 5-3: Allocation of responsibilities in the Belgian EPR system for household packaging waste²⁰

	Collection	Recovery	Monitoring and enforcement
Economic	The PROs cover full cost of collection of standard collection scenarios, defined in their accreditation. Either direct financing of tendered contracts or financing of municipal services based on a negotiated price.	The PROs finance the recycling and receive the revenues. This money is used to finance (partly) collection and sorting.	The IVCIE enforces the legislation and can take free-riders to court.
Physical	Collection is performed by (inter)municipal services or private companies after tendering. In this last case, the tendering procedure is done by the intermunicipal organisations	Private companies based on tendering procedures organised by the PROs.	Municipalities enforce separate collection, the PROs guarantee the recycling with audits of the recycling companies.

²⁰ Largely based on information provided by Mr Christof Delatter, VVSG.

	in concertation with the PRO.		
Informative	Both PROs and (inter)municipalities report data, allowing for a double check. Both municipalities (and their intermunicipal organisations) and the PROs communicate about the sorting instructions.	Both the PROs and recyclers have to report.	The IVCIE enforces the legislation and reporting.

System functioning²¹

When a household buys a packaged product (e.g. plastic bottle of water), the price paid already includes a fee for recycling which is forwarded by packagers to Fost Plus. Households can later discard the packaging waste for free, as Fost Plus takes care of the financing of collection and recycling. The most common collection infrastructure looks the following:

- Glass is collected in glass containers in the streets, separated into white and coloured fractions; exceptionally in some municipalities there is kerbside collection, but there is no full-cost coverage on the part of Fost Plus in that case.
- Paper and cardboard are collected kerbside together with mixed paper waste. Costs for collection are split between Fost Plus and the municipalities according to the share of paper packaging in the mixed paper waste (30% of the cost is allocated to packaging). The revenues from the recycling of the waste are equally split (Fost Plus gets 25% of the revenues)²².
- PMD (plastic bottles and flasks, metal packaging, drink cartons) are collected kerbside in transparent blue bags to allow quality control.
- Packaging waste is also collected at civic amenity sites, for which there is no full-cost financing on the part of Fost Plus.

Fost Plus gathers data from packagers, waste collection and recycling companies and municipalities. On the basis of this data, Fost Plus proves to the central IVCIE how much of the household packages have been recycled annually. The integration of the financial cost at the moment of purchase of the package is almost complete in this system.

5.2 Germany

Legal basis, national targets and performance

The German Ordinance on the Avoidance and Recycling of Packaging Waste (VerpackV)²³ was introduced in 1991 and it was the first policy of this kind (Fishbein, 1996), applying the then virtually unknown principle of EPR to the stream of packaging waste. The Ordinance

²¹ Based on information provided by Mr Christof Delatter, VVSG.

²² The difference between costs and revenues is due to the fact that paper packaging waste is considered to be more voluminous and therefore more expensive in collection than other non-packaging paper material (BIO Intelligence Service, 2012a).

²³ Verordnung über die Vermeidung und Verwertung von Verpackungsabfällen (Verpackungsverordnung - VerpackV)

was amended several times since its introduction to reflect the changes in the European legislation and to adapt the system to competition and its resulting effects (an overview of the key changes is given in Appendix I). The core of the legislation is the take-back and recovery of all used packaging by producers and distributors of packaged products. They are required to join a PRO and only under certain circumstances (packaging waste comparable to household, which is produced in small commerce and managed separately from the system – so-called “branch solution”) could they execute their obligations individually. In all cases, obliged industry is required to bear the full cost for collection, sorting, recycling and recovery. It does not have a financial responsibility for packaging that is thrown in the residual waste bin.

As a result of the Packaging Ordinance in the beginning of the 1990s a new system was created that was operating in parallel to the already existing municipal waste management system, hence the name Dual System. In a study released in 2012 by the German Anti-trust Authority, a distinction is made between “a dual system” and “the Dual System” - important distinction that will also be made in the current paper. While “one dual system” describes one single dual system operator (i.e. a PRO), “the Dual System” stands for the entire system of packaging waste take-back and recovery that results from actions of the system operators and subcontracted waste management companies (Bundeskartellamt, 2012, p. 11).

In this paper, the terms “PRO” and “a dual system” will be used interchangeably and will refer to each of the competing PROs for household packaging waste present on the German market.

The Ordinance transposes the European Packaging Directive into national law and includes the European targets of at least 65% recovery and at least 55% recycling by weight of the annual share of packaging waste by 31 December 2008. Beyond that, further targets for different types of materials contained in packaging aimed at private end consumers are set (outlined in Table 5-4).

Table 5-4: German recycling targets for household packaging waste

Material	Paper/ Card	Composites	Glass	Tinplate	Aluminium	Plastics
Recycling target (by weight)	70%	60%	75%	70%	60%	36% ²⁴

Source: *VerpackV, Annex I to §6*

The system only covers packaging waste from private households and comparable waste from small commercial sites (BIO Intelligence Service, 2011). When packaging is produced within industry, the waste management is set up by the concerned actors themselves. When it comes to industrial packaging, there are no rules for collection systems or recovery targets and no state control over the fulfilment of obligations (VKU, 2014). There is mandatory deposit of at least 0.25 € on one-way beverage packaging, first introduced in 2003. Cans, glass and plastic bottles are part of the deposit-refund system and packaging that is considered to be “ecologically advantageous”²⁵ is excluded from it (DPG Pfandsystem, n.d.).

²⁴ The Packaging Ordinance sets a target of at least 60% recovery of plastic packaging, of which 60% should be materially recovered (VerpackV, Annex I to §6).

²⁵ Refillable packaging and drink cartons fall under the „ecologically advantageous“ category.

For the calculation of the recovery rates, the reference value (100%) is the amount of packaging licensed. As a consequence, the level of achieved rates depends not only on the quantities recovered but also on the extent to which obliged parties comply with the legislation and fulfil their obligation of reporting and licensing.

The recycling and recovery rates are shown in Table 5-5. The figures refer to 2011.

Table 5-5: German performance for household packaging

Recycling rate (all materials)	75%
Recovery rate (all materials)	80%

Source: BIO by Deloitte (2014)

Actors, roles and responsibilities

- Obligated industry

If the amount of packaging put on the market by a specific company is above the threshold quantities defined in the legislation, the obliged companies have to since 2009 declare to the Association of German Chambers of Industry and Commerce a so-called declaration of completeness, which reveals the amounts which have to be licensed and the amounts for branch solutions. The amounts of sales packaging which are placed on the market are more or less based on estimates. The estimated data in the declaration of completeness is to be certified by an approved auditor. Further inspections do not take place and administrative control does not happen in practice (L. Wagner, personal communication).

Obligated industry is required to join a PRO or, in specific cases, can fulfil their legislative requirements through a branch solution. Branch solution is applicable when packaging waste occurs out of home on sites with consumption patterns comparable to those of a private household (commercial end-user), such as hospitals, educational institutions, hotels, restaurants, cinemas (specified in VerpackV, §3, para.11). In these cases the waste can be collected and recycled separately from the household collection system thus compliance can be executed without joining a dual system and paying licence fees. Because of this second effect, this option seems to have been used extensively by obliged industry to avoid their duties. The last amendment to the Packaging Ordinance tightens the requirements in this respect. Each producer who reports packaging in a branch solution will be required to submit evidence from an independent expert of collection arrangements in place for each commercial site to be included in the branch solution. The evidence is to be provided to each of the 16 State authorities that are competent in the matter.

The latest amendment to the Ordinance removes the hitherto existing third option for compliance - the so-called self-compliance or self-takeback mechanism. It will be removed from October 2014 as it is believed that this option has been extensively misused. For self-takeback it is assumed that packaging is given back by consumers at the point of sale (i.e. at the store), but there was no formal monitoring. In fact, only very small amounts are ever withdrawn in the stores or disposed of in a separate disposal system at small businesses at the points of origin (most likely the disposable tableware in the catering business). As a consequence, packaging for which there was no financial contribution to the Dual System, lands in household packaging waste containers financed by licence fees paid to PROs.

- PROs

The first PRO was created on initiative of the packaging and retailer industries in anticipation of the Ordinance and its initially planned very stringent objectives and introduction of a deposit-refund system for beverage containers. After a negotiation process between industry and the government, but excluding municipalities, the Dual System model was adopted. DSD²⁶ was created as a not-for-profit organisation to exempt the industry from their take-back obligation. However, due to a number of factors (in particular: short timeline for targets, no previous experience, free-riders), the system soon run into major financial difficulties. The funding of obliged companies was by far not sufficient to cover the financial gap and therefore other sources of funding were needed. After intense negotiations between the obliged industry, government and the waste management sector a compromise was struck to rescue the system. Crucial part of the agreement was that the waste management industry transformed its open financial claims on DSD into loans, it got a quarter of the supervisory board seats and long-term ten year contracts were awarded to the participating waste management companies. These decisions were later heavily criticised both by the German Anti-trust Authority and the EU Competition Directorate. As a result the status of the DSD changed from not-for-profit to profit and the market was gradually opened to competing PROs from 2003.

Today, there are altogether nine or ten dual systems (depending on how mergers are counted and on the status of PROs in the process of authorisation). All systems are currently operating nationwide. DSD has a dominant market share (above 50% in the first quarter of 2013), and the rest are Belland Vision, Redual (VfW), Interseroh, Landbell, RKD, Zentek, Eko-Punkt (announced to discontinue operations by the end of 2014), Veolia Dual and ELS (in approval process).

To obtain a licence and operate as a PRO an undertaking must apply to each Federal State (sixteen in total) in which it wishes to provide the service. Such a licence is granted if it provides a comprehensive system for the collection of such waste for the entire State (“full coverage”), has coordinated the collection with the respective municipalities and has organised the recovery of the waste. The collection has to be co-ordinated with the municipalities for practical and legal reasons. Once a licence has been granted the PRO has to ensure the free collection of the waste from consumers and compliance with the recycling targets (OECD, 2013a, p. 103).

The Dual Systems have to provide evidence about the fulfilment of the quota and an area-wide disposal system to the Federal States, but do not have to disclose their customers. The collected, sorted and recovered volumes are covered by recycling/ recovery weighing notes and administered through an electronic data processing platform which is used by all PROs. These amounts are then weighed against the data given by the obliged industry to the Association of German Chambers of Industry and Commerce. There are usually annual differences which result in financial compensations between the systems as described below.

- Central Office of the Dual Systems in Germany (CODS)

As required by the Packaging Ordinance (§ 6, para.7), all dual systems have to take part in a joint body. For that purpose the CODS was created in 2007 as a joint venture by the dual

²⁶ Duales System Deutschland

systems and a law firm is commissioned with its management. In particular, the Joint Body has the following tasks:

- 1. Assessment of the quantities of packaging of several compliance schemes in the area of a public body responsible for waste management to be assigned on a pro rata basis,*
- 2. Allocation of the coordinated supplementary fees,*
- 3. Coordination of tendering in a way that does not distort competition.*

Each of the dual systems has to report to the CODS the amount and type of packaging that was registered with them by the obliged companies. Based on these reports the CODS establishes quarterly the total amount of licensed packaging and the share of each of the systems for the three packaging types (paper, glass, lightweight packaging) for each State.

In turn, based on the market share are decided also the financial contributions of the PROs to the system (i.e. costs for collection, costs that are allocated to municipalities for additional services). With respect to market share and the related division of costs, there are further intricacies of the system. The market share of each PRO depends on the percent of licensed material from the total licensed volume without the amount of self-takeback and branch solutions. The bigger the amount of licensed material relative to the alternative solutions, the bigger is the financial contribution for the PROs. A free-riding practice that was identified in that respect is the following: through recycling/recovery weighing notes from the commercial disposal management (for which there are no obligations to provide proof for quotas) the PROs enable their customers to present large quantities of self-takeback material at the same time to reduce their own licensed volume. For PROs this is attractive as it makes their official market share – according to which the costs are decided – much lower than in reality.

With the CODS, the market shares are defined quarterly as an outcome of negotiations between the systems. In case of disagreement, the system is instable, as waste bills would not be fully paid. During the summer months of 2014, the disagreements were so profound that it was thought by many actors that the system was on the verge of collapse. It appeared that systems have applied the above-described practice intensively and, as a result, the licensed volumes have decreased so sharply, that the entire system has become financially unsustainable.

In the future, a “Central Unit” is envisaged where market shares would be decided by the government. Further, there are discussions around the fact that the CODS does not have the mandate nor the power to control or monitor the dual systems.

- Municipalities and public waste management companies

Municipalities are in charge of the household waste except packaging. A PRO has to coordinate the collection system with the municipality on the territory of which it operates. Municipalities may demand the take-over or joint use of collection facilities for a suitable fee, and can ask that non-packaging waste of the same material type is collected against a suitable fee. On the other hand, PROs can also demand for a joint use of the collection facilities against a suitable fee. For example, paper and cardboard packaging is collected kerbside together with newsprint and other post-consumer non-packaging wastepaper. The collection of this fraction is organised by the local public waste management authorities and can be commissioned either to a municipal or to a private company. The dual systems reimburse a percentage of the collection costs depending on an evaluation of the content of packaging

material in the respective district. They then interact with the company chosen by the local authorities on an individual basis and make contracts for a quantity defined by their respective market share.

Municipalities are further reimbursed by the PROs for a portion of the costs that they incur for providing and maintaining the public sites, cleaning service and information to the general public (VerpackV, §6, para.4)

- Private waste management companies

Five of the PROs are vertically integrated²⁷ meaning that they are owned by operationally active private waste management companies (Bundeskartellamt, 2012). They operate part of their services in-house or with associated companies. The rest of the PROs – those that are not vertically integrated – contract out to third parties.

Table 5-6: Allocation of responsibilities in the German EPR system for household packaging waste

	Collection	Recovery	Monitoring and enforcement
Economic	Obligated industry either through license fees to the PROs or through branch solutions via third parties	The PROs cover the costs for recovery and receive the revenues. It is their business secret what happens with the revenues since license fees are result from the market and not refer to cost and revenues.	None identified
Physical	PROs organise by contracting either private or public waste management companies through tendering	PROs organise by contracting either private or public waste management companies through tendering	Approved auditor
Informative	Each PRO reports to the Federal States through an electronic data processing platform Both municipalities and PROs are responsible for communication, but it is not regulated in detail.	Each PRO reports to the Federal States through an electronic data processing platform	It is the task of the national governments of the Federal States

System functioning

Waste collection systems differ regionally, but the most common setup is with three containers for the different packaging materials.

- Paper and cardboard packaging is collected kerbside in a “blue bin” together with newsprint and other post-consumer non-packaging wastepaper (PPK fraction), which is part of the municipal collection of graphic paper;
- Lightweight packaging is collected kerbside in a “yellow bin” or “yellow bags”;

²⁷ Eko-Punkt (Remondis/Rethmann), Interseroh (Alba), Veolia, BellandVision (Sita/Suez/GDF), Zentek (Stratmann/Nehlsen/Becker)

- Glass is collected in glass containers in a bring system, i.e. in close proximity to the private end-user but not at their doorstep.

The collection of the blue bin is organised by the local public waste management authorities and can be commissioned either to a municipal or to a private company. The dual systems reimburse a percentage of the collection costs depending on an evaluation of the content of packaging material in the respective district. They then interact with the company chosen by the local authorities on an individual basis and make contracts for a quantity defined by their respective market share.

For the two latter fractions – lightweight packaging and glass – the PROs are in charge of organising the waste collection. There are some specificities related to the stage of collection due to the requirement for full-coverage and for coordination with municipalities. In practice, this means that lightweight packaging and glass have to be collected jointly by the PROs. Up to 2012, only DSD tendered collection. Afterwards, the mechanism that was chosen was that of alternating tender organisers, where each PRO assumes the role of tender organiser in a number of collection districts determined by the market share of each PRO such as determined by the CODS (Bundeskartellamt, 2012). The PRO in charge of organising the tender needs to bear more than 50% of the cost irrespective of its market share (which is then compensated in other areas). All the other PROs have to contract with the company that was chosen by the tender organiser and have to then individually negotiate the prices.

In the end of the process, each PRO should end up with a quantity of unsorted material and have to manage individually the subsequent stages of sorting and recycling.

5.3 Austria

Legal basis, national targets and performance

The general provisions in the area of waste management are set in an overarching Waste Management Act (AWG)²⁸. The rules for the management of packaging waste are laid down in the Ordinance on prevention and recycling of packaging waste and the remaining items of certain goods and the establishment of collection and recycling systems²⁹ first introduced in 1992. The Ordinance obliges manufacturers, importers, packers and distributors of sales packaging take part in one or several authorised collection and recovery systems (PROs). The hitherto existing possibility to take back and recycle packaging individually ceases to exist with the entry into force of the latest version of the Ordinance in January 2015. A registered PRO has to accept all actors wishing to participate in its system and charge a licence fee equal for all contracting partners and based on the full-cost covering principle. With the amendment in the legislation municipalities get reimbursed some of the costs for packaging in the residual waste. According to the Ordinance, the following recycling targets have to be met in common (Table 5-7). Further, there are specific collection and recycling targets that PROs have to achieve (VerpackVO, §9, para. 4 and 5).

Table 5-7: Total recycling targets for Austria

Material	Paper/	Glass	Metals	Plastics	Beverage	Other	Wood
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²⁸ Bundesgesetz über eine nachhaltige Abfallwirtschaft (Abfallwirtschaftsgesetz 2002 – AWG 2002)

²⁹ Verordnung über die Vermeidung und Verwertung von Verpackungsabfällen und bestimmten Warenresten und die Einrichtung von Sammel- und Verwertungssystemen (VerpackVO)

	Card				compound	compound	
Recycling target (by weight)	60%	60%	50%	22.5%	25%	15%	15%

Source: VerpackVO, §5, para.1

Currently, there are three PROs for household packaging in Austria that have different scope and, therefore, do not compete with each other directly. However, in 2013, both the Waste Management Act and the Ordinance were amended with the view to create conditions for “fair competition”. With the entry into force of the legislation in January 2015, other PROs will be able to enter the household packaging market and to directly compete with the current dominant PRO ARA³⁰.

The Ordinance regulates both the household and the industrial packaging waste and draws a line between them, proscribing any cross-subsidies between the two sectors. The amendment to the Waste Management Act further clarifies the distinction between household and commercial packaging which is standardized and binding for all obliged companies and PROs.

The recycling and recovery quotas are calculated as percentage of the quantities put on the market (VerpackVO, §5, para.1).

The performance of the system is shown in Table 5-8. The figures are from 2010.

Table 5-8: Austrian performance for total packaging

Recycling rate (all materials)	67%
Recovery rate (all materials)	92%

Source: BIO by Deloitte (2014)

Actors, roles and responsibilities

- Obligated industry

From the 1st of January 2015, for consumer packaging it is mandatory for companies subject to the Ordinance to take part in a collection and recovery system³¹. Such companies have to sign a licence agreement with a registered PRO and pay the material-specific fees. Obligated companies have to report annually to the Ministry of Environment the quantities of packaging that they put into circulation on the Austrian market.

- PROs

ARA was founded in 1993 by Austrian packaging manufacturers, fillers, packers, importers and trade companies to ensure compliance with the legislation. It is a not-for-profit joint stock company, owned each 1/3 by the three groups: wholesalers/retailers; packers/fillers/importers; and packaging producers. Because of its not-for-profit nature, there is no connection between ownership of ARA and business, meaning that companies that are shareholders of ARA are not impeded to choose another PRO to overtake their responsibilities (C. Stiglitz, personal communication). Waste management companies are

³⁰ Altstoff Recycling Austria AG

³¹ Up until then, companies have the alternative choice of complying individually.

excluded from the governance. Recovery and recycling revenues are used to lower the fees. Unplanned revenue surpluses are indirectly attributed back to the customers as they are also used to lower tariffs. For the last years ARA has generated substantial surpluses. This has resulted in the decrease of average licence tariffs by 61% between 1995 and 2013 (ARA, 2014).

ARA is complemented by AGR³², which is a partner company responsible for glass packaging.

Öko-Box was created in 1991, originally on the initiative of producers of beverage cartons. In the beginning the system had only modest success, due to operational difficulties and low acceptance on the part of the general public. With time 95% of the fillers using this type of packaging have joined the system and today the territory of the whole country is covered (G. Matyk, n.d.). The systems functions through special carton boxes (Öko-Boxes). Those are distributed to households free of charge, can be filled with empty beverage cartons and are either collected kerbside at regular intervals or can be send exempt from postage via any post-office. All Öko-Boxes are sent to a recycling plant in central Austria. Beverage cartons are nevertheless also collected through the ARA system.

The new version of the Ordinance brings changes to the functioning of the PROs. From January 2015 PROs will have to offer services for one or more specified categories of packaging (paper, glass, metal, lightweight packaging), a restriction to one specific material fraction within a category is not allowed. As a result, Öko-Box reacts by announcing its strategic merger with ARA.

The amended law aims to open the market for household packaging waste to competition. In principle, competition had been legally possible already before, but might have been prevented in practice. The European Commission had sent ARA a statement of objections for suspected abuse of dominance on the markets for the management of packaging waste by hindering competitors to enter or expand on these markets. However, the statement of objections is just a formal step in Commission investigations into suspected violation of EU competition law and does not prejudice the final outcome. Investigation proceedings are still ongoing (European Commission, 2013).

The revised legislation aims to ensure that the legal possibility of market entry ultimately translates into effective competition. From 2015, several other PROs, operationally active in the sector of industrial packaging waste, are planning to enter the market. (Reclay UFH, Interseroh, Landbell, Gut and Bonus). The new PROs will have to use the already existing collection infrastructure in order to avoid duplication and confusion of the general public. The new Ordinance defines uniform tariff categories that are valid for all system providers with general tariffs that have to be offered for each tariff category. Every PRO is obliged to make the tariffs publicly available and to treat its customers equally (VerpackVO, §9, para.2). PROs will also be responsible for informing consumers on the appropriate way of handling packaging waste (prevention, reuse, separate collection) as well as on the bring back possibilities. Related requirements of the Ministry have to be taken up in an agreement with the Packaging Coordinating Body (VerpackVO, §20).

PROs will have to transmit the following information yearly to the Ministry of Environment:

³² Austria Glass Recycling GmbH

- The quantities of separately collected, recycled and recovered packaging; the name and address of the waste management operators taking care of the waste and the type of recovery it undergoes; as well as confirmation from the operators
- Electronic list of licence partners with respective licensed quantities
- The quantities of packaging put on the market by their licence partners (VerpackVO, §9, para.6).
- Municipalities and public waste management companies

Municipalities are responsible for household waste collection except packaging waste. In the case of paper packaging, the municipal collection infrastructure is co-used by the ARA for a suitable refund of costs.

However, packaging waste found in the residual waste has been a major issue for municipalities (J. Mayr, personal communication). This has not posed significant difficulties for glass and metal – materials that have high market value – but has been a serious problem for lightweight packaging. The amended Ordinance contains provisions for municipalities to also receive compensations for packaging found in mixed waste. The calculation of these compensations will be performed every three years and will take into account the volume of packaging waste collected together with the residual waste, the proportion of packaging waste that is separately collected and the total amount of packaging put on the market (AWG, §29b, para. 5). The exact calculation method is to be decided.

All PROs also reimburse municipalities for a part of the costs related to the use of public space for waste containers, cleaning services, additional packaging collection at municipal collection sites and communication to the general public.

- Private waste management companies

ARA holds regular public tenders for the three steps collection, sorting and recycling. Those can be won either by municipalities and their waste management companies or by private waste treatment operators.

- Packaging Coordinating Body

Up to now ARA was making sure that actors who bring packaging on the market pay for the collection and recovery of that packaging by commissioning audits of its licence partners on a random basis. From 2015 on, it will be the task of the newly created Packaging Coordinating Body to control free-riders. Further tasks will be the coordination of information and communication directed at the general public.

However, for the moment there are still political discussions around the ownership and governance of the Coordinating Body.

Table 5-9: Allocation of responsibilities in the Austrian EPR system for household packaging waste

	Collection	Recovery	Monitoring and enforcement
Economic	PROs cover the full cost of collection decided through	The PROs finance the recovery and receive the	It will be the task of the newly created Packaging

	tendering procedure. The cost is born by obliged industry (in turn transmitted to consumers)	revenues from the sale of materials. This money is fed back into licence fee calculation	Coordinating Body
Physical	Collection is performed either by municipal services or private companies after tendering by PROs.	Private companies based on tendering procedures organised by PROs	The PRO had to report to the Ministry for the Environment
Informative	PROs have to transmit this information to the Ministry of Environment. Municipalities are responsible for awareness to the public, but receive money from PROs (coordinated by the Packaging Coordinating Body)	PROs have to report to the Ministry of Environment.	The Ministry of the Environment collects the data on waste collected and recycled and monitors compliance

System overview³³

The most common collection infrastructure looks the following:

- Glass is collected in a bring system located in the neighbourhood, separated into white and coloured and is managed by AGR;
- Metals are also collected in public containers in the streets;
- Paper and cardboard are collected kerbside together with mixed paper waste;
- Lightweight packaging is collected kerbside. Carton beverage packaging can also be separately collected through Öko-Boxes.

The revised Waste Management Act proscribes a duplication of collection infrastructure. PROs cannot therefore build any additional facilities but have to use the already existing ones (“co-usage”). This is valid both for the existing infrastructure owned by ARA, AGR and Öko-Box and for municipal infrastructure (public collection sites, mixed paper waste).

In the first case, a new PRO makes a contract with an already existing one and thus can achieve full area coverage. Details (costs, amount of handled waste) are arranged with the system whose infrastructure is co-used (AWG, §30). In the case the infrastructure is owned by municipalities, each PRO makes own contracts with all responsible public bodies (AWG, §29c). Municipalities and waste management companies are obliged to sign a contract and to treat equally the PROs. Price differences are only admitted if objectively justified.

After collection, packaging of all four categories is distributed to the PROs. The amounts are decided according to their respective market share. Each PRO is then responsible for sorting and recycling. This way of operation of the system will be valid until 2017 when the current tendering contracts expire.

For the time after 2018, new tendering will be organised with duration of five years. For one tender period of five years each PRO will tender out the collection in a number of contractual territories corresponding to its market share. The rest of the PROs are bound to co-use the

³³ Largely based on information found on the ARA website.

structures. If any of the PROs has not achieved a market share of at least 5% but has been operational for three years, then its licence can be withdrawn by the Ministry of Environment (VerpackVO, §9, para.8). However, the exact conditions for the future functioning of collection activities are still to be decided through a stakeholder dialogue.

6 Analysis and discussion

The present chapter builds on the information in Chapter 5, by adding some further findings and organising the factual information according to the analytical framework. In the first part of the chapter (6.1) few features of the systems in the three countries are described in parallel (relative to system design, scope, role of municipalities, calculation methods). The systematised information aims to facilitate the reader. Afterwards, the set of policy evaluation criteria selected in Section 2.3 is employed. The performance of the system in each country is benchmarked against the criteria with focus on the role that competition on the PRO level and involvement of municipalities play in the functioning of the system. The purpose is to identify possible advantages or disadvantages of the various designs, which would allow to draw conclusions relative to the implications of the two aspect.

6.1 Similarities and differences between the three systems

The three countries were among the first ones to introduce EPR systems for managing packaging waste in Europe in the beginning of the 1990s. In the beginning they have all opted for an approach where a single common not-for-profit PRO was created, owned and managed by the obliged industry. Today, Belgium has kept the original system in this respect, in Germany there are competing profit-seeking PROs and Austria will change its situation from a single one to competition starting from 2015. In Germany, there is additionally a mandatory deposit-refund system on one-way beverage packaging. In the three countries there is further the tradition and some mechanisms in place for returning refillable bottles. As glass is heavy material, it weighs heavily in the packaging waste mix and is also the fraction that achieves highest recycling rates (typically around 90%). For this reason, refillables are likely to affect statistics and recycling rates, but at the same time the flows are not easy to track and compare.

In Germany, the scope of the system is limited to packaging waste from private households and comparable waste from small commercial sites. Industrial waste is not part of the system, but has to be organised by individual companies, with no formal targets or state control mechanism in place. As the system was introduced in the early 1990s, the legislators did not see the need to set targets as it was considered that industrial waste is valuable and is going to be recycled anyway (T. Lindhqvist, personal communication). In Belgium and Austria, collective systems were set for both household and commercial & industrial packaging waste from the starting years. In Belgium the two are strictly separated – there are two separate PROs having to fulfil legislative targets independently. In Austria, the separation of cost structures for the household and the commercial sector is required by law. However, both in Austria and in Germany, the majority or all of the PROs are active on both markets. In Belgium and Austria, the PROs have to cover the whole territory of the country whereas in Germany, PROs must be able to cover the whole territory of each Federal State in which it operates, not necessarily of the whole country. In practice, they all operate nationwide, since producers usually sell nationwide and are not interested in a system active only regionally.

The three countries have legislative requirements to a similar type of economic agents, falling under three broad categories: fillers (producers and importers of packaged goods), retailers and producers of packaging. In the three countries, they are given several choices for compliance: individual takeback in Belgium, choice between several PROs in Germany and Austria. It can be noted that individual compliance existed also in the latter two countries but was later abolished as the risk of free-riding seems to be higher when there are both competing PROs and individual compliance. The obliged industry has to bear the full cost of collection, sorting and recycling of the packaging they put on the market. In Belgium and

Austria they are also responsible for covering partial costs of packaging waste found in the residual waste. In the three countries, PROs contribute to communication to the general public, either through the (inter)municipalities (in Belgium and Germany) or through a coordinating body (Austria). In Germany and Austria, PROs reimburse municipalities for part of the costs related to the use of public space for waste containers and cleaning services. In Belgium these compensations are defined in a standard contract set by the relevant public authority (IVCIE).

In Belgium, municipalities organise the collection (which they then either perform in-house or subcontract to private waste management companies), whereas in Germany and Austria this is only the case if municipalities win the tender organised by the PROs. These organisational arrangements carry different implications for the setup of the collection infrastructure. In Germany and Austria the infrastructure is provided by the PROs or their collection partners, which – from DG Competition’s perspective – holds a potential risk of abuses in terms of blocking the access to competitors. In Belgium, this risk is seen to be less of an issue since the collection infrastructure is in the hands of local authorities (S. Kijewski, personal communication). In the three countries PROs are owners of the collected material and organise the subsequent recycling activities. In case of competing PROs, a separate organisation is set up which is in charge of determining their market share and attributing the collected materials accordingly.

Belgium is the only country where the type of packaging collected by the system is standardised throughout the country. In Germany and Austria collection differs regionally, but for the lightweight packaging fraction, it is generally more comprehensive than what is collected in Belgium. In Germany, a range of different plastic fractions are separately collected including plastic bags, yoghurt pots, plastic wraps, foam containers, etc. In Austria, small-size plastic packaging is disposed of in the residual waste bin and in selected (predominantly urban) areas the separate collection is restricted to rigid plastic bottles only (Baum, 2014). In Belgium what goes into the lightweight packaging fraction is quite restricted – only plastic bottles and flasks are collected, other plastic packaging is excluded. IVCIE explains the rationale behind such a choice: as these materials are fit for high-quality recycling, they should be collected and recycled, whereas other thin plastics would only be suitable for low grade recycling, where there is virtually no difference with incineration (M. Adams, personal communication). Furthermore, the selected materials have also high value; the implications of this will be discussed later on in the paper. If Figure 4-1 is considered, it appears indeed that in Germany, the proportion of energy recovery of separately collected packaging waste is higher than in Belgium, where in turn, the proportion of energy recovery of packaging found in the mixed waste is more significant.

At the EU level, certain provisions are given on the presentation of statistical data on packaging waste.³⁴ However, there is no harmonisation of the calculation methods and, therefore, comparison of figures between countries is by no means straightforward. For instance, in Belgium, recycling flows are calculated as the output of the sorting centre (“output method”), meaning that the sorting residue, which sometimes amounts to 10 – 15% for the lightweight packaging fraction, is not taken into account (M. Adams, personal communication). In Germany an “input method” of calculation is used, according to which such residue is part of the recycling figures (L. Wagner, personal communication). In addition to the sorting residue, which is then energetically recovered, plastics used for secondary fuel and for the production of low-grade products is equally counted as recycling. On the other

³⁴ Laid out in the Commission Decision 2005/270/EC of 22 March 2005 establishing the formats relating to the database system pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste.

hand in Germany, there is a deposit-refund system for beverage packaging. As PET-bottles and aluminium cans fall largely under this system, they might considerably influence figures for plastics and aluminium.

The discussion on the difference in counting methods will not be continued any further, also because, except for Belgium, relevant information does not appear to be publicly available and any attempt to compare would be ungrounded. The short overview serves more the purpose of illustrating the difficulty of comparing statistical data even more so when it is not always transparent what such data is supposed to represent. Some of the implications of the chosen calculation method will be examined in the next sections.

6.2 Effectiveness and efficiency

Belgium

The Belgian system is perceived as highly effective and efficient by all stakeholders interviewed – obliged industry, Fost Plus, (Inter)municipalities, IVCIE, private waste management companies, representatives from the European Commission. There are several aspects of the system that are seen to play a decisive role in that respect.

Not-for-profit PRO, owned and managed by the obliged industry

The first aspect concerns the not-for-profit character of the PRO and the degree of involvement of the obliged industry in the management of the organisation. Since no profit motives are involved, it is seen that a sense of solidarity is promoted, which makes it easier to take decisions and work towards a common goal; otherwise everyone would defend their own individual interests at the expense of others' (F. Van Tiggelen, personal communication).

From the public point of view, the not-for-profit character is seen as measure to protect the consumer, who does not have any control over the system, from a potential price-level drift of a monopoly undertaking similar to the one experienced in the energy sector (M. Gillet, personal communication).

Single PRO and competition on the level of waste management operations

The industry is not interested in creating competition on the operational level as Fost Plus is not itself performing physical activities related to packaging waste management but is instead delegating those. As organisational costs represent only a small block of the total costs, industry did not see the business sense in organising competition at this level. For them, it would just add some intermediaries who would seek profit, but deliver no added value (F. Van Tiggelen). Where the industry sees a business interest to have competition instead is on the operational level which is also assured in Belgium through the regular use of procedures comparable to those of public tendering, with clear and transparent rules.

Strong regulatory framework

A very important aspect of the Belgian packaging legislation is the strict separation and clear targets both for household and for industrial packaging. This is seen as crucial for avoiding any malpractice and ensuring that for each waste stream actions are taken by the concerned actors (M. Adams, personal communication).

Effective government control further ensures that legislative requirements are respected. Public control is in fact actively demanded by different stakeholders. Because of the federal division of the country, obliged industry is particularly satisfied with having harmonised requirements and a unified system (which is not the case for other waste streams such as the WEEE). The involvement of public authorities brings some stability in that respect. Strict rules and government control is also in the interest of private waste management companies to ensure equal treatment and a level-playing field in the bidding process, and to give incentives for delivering an effective service.

An independent body that acts as a referee

As there are inevitably differing interests among the various types of stakeholder, the presence of an independent body that acts as a referee for some contentious issues is seen as key to the effectiveness of the system.

An example where there are a lot of negotiations and sometimes disagreement is when after the negotiation of a standard contract between the association of intermunicipalities (on behalf of all municipalities for a region) and Fost Plus, such contract is set up and each municipality clarifies the further details individually with Fost Plus. Usually, the two parties come to an agreement for 80% of the issues; for the rest, the decision-making body of the IVCIE takes a final decision (C. Delatter, personal communication).

Cooperation with municipalities

In the views of the different stakeholders the fact that municipalities are responsible for the collection of packaging waste has many advantages and is keenly supported. For one, the involvement of municipalities has the potential to achieve synergies with municipal collection systems and ensure an integrated approach to household waste management (C. Delatter, personal communication). Even though it is acknowledged that as public entities municipalities might sometimes lack the flexibility and the efficiency associated with the private sector, the type of service that is rendered is taken into account by the obliged industry. Waste collection is largely perceived as a common goal and in that sense, the implication of a public entity is seen to ensure environmental effectiveness. Unlike private profit-seeking companies, municipalities are associated with long-term orientation and public service and therefore viewed as reliable partners for waste collection also from the point of view of the industry. In any case, the industry is highly involved and steering the system, it can influence (both the system and the municipalities) to evolve and perform efficiently (F. Van Tiggelen, personal communication).

In EPR for household packaging waste the ultimate success of the system depends largely on citizen participation. As municipalities are close to the people through the mayor and political representatives, they are seen as key to ensure a coordinated and successful communication.

Unique system focused on high-value materials

In Belgium the legislation sets the target of 30% recycling by weight for plastics and in practice only one fraction of the plastics (bottles and flasks) is sufficient to cover the target. It was therefore decided early on that only limited type of plastics would be separately collected. It also turns out that the chosen fraction is the one having high value and, because of the separation at source, high quality. As a result, the materials that Fost Plus delivers to recyclers are of very high quality, also higher than the European average, and Fost Plus is able to

market them very profitably. The overall system cost is covered on the one hand, by membership contributions (licence fees) and on the other, by revenues from materials. Since the revenues are high, this allows to decrease members' contributions. Also, it is argued that the lack of parallel systems, such as deposit-refund, further contributed to the high overall efficiency (M. Adams, personal communication).

One possible issue with the choice of materials going into the lightweight packaging fraction is that sorting instructions are seen as complicated, at least from the point of view of municipalities who are confronted with consumer confusion. As this fraction is usually collected in transparent blue bags, collectors are able to identify waste that should not be there. One in every five blue bags contains impurities and they are rejected already at the collection stage (by putting a red sticker on the bag and leaving it uncollected at the doorstep). From the remaining 80% of collected plastic waste after the sorting plant 15% are still residues (C. Delatter, personal communication). It is acknowledged that solutions need to be found for the plastic fraction also considering that the legislation is expected to push for higher targets in the future.

Germany

The research has established that opinions in terms of effectiveness and efficiency differ widely among the stakeholders.

In 2012, the German Federal Competition Office conducted a sector inquiry into the operation and performance of dual systems with focus on establishing interim results of competition between PROs (Bundeskartellamt, 2012). The conclusions of the study suggest largely positive effects of the introduction of competition. The Federal Competition Office stresses that re-monopolisation in this sector should be by all means avoided and commits itself to further strengthen the liberalisation of the market by removing remaining restrictions of competition. According to the study, competition on the market has stimulated innovations in sorting technology, especially for the lightweight packaging fraction, which in turn has led to significant improvement in sorting quality and recycling rates. The reason for this is seen in the economic incentives created by the fact that sorted materials have a positive market value that can bring revenue when these are materially recycled. This argument counters common fears that recycling rates would decrease as a result of competition as dual systems will opt for less costly treatment operations such as incineration or landfill. The Federal Cartel Office therefore expects that in view of these economic incentives, the trend towards increased high-quality plastic recycling will continue. The arguments brought in the sector inquiry are supported by statistics that are based on data provided by the dual systems and compiled by the Competition Office. The findings of the sector inquiry are largely backed by the Federal Ministry for the Environment and the voluntary association of retailers, consumer good producers, packaging and recycling industries (RecyclingNews, 2013b).

However, the claims are not supported universally. As the recycling and recovery rates are based on the quantities that are licensed, it is argued that the figures grossly misrepresent the situation (VKU, 2014). The reference value is methodologically correct, as all obliged companies are supposed to license the total amount of packaging they place on the market. The licensed amount should therefore correspond with the amount placed on the market and shortly afterwards ending as waste. However, it is argued that the reality is very distant from the theory. The difference between licensed quantities and quantities of packaging waste that are actually collected is estimated by some sources at 30 – 44% (Baum, 2014). The main reason would be a massive under-licensing, as many companies either not at all or not fully fulfil their legal obligations. The exact number of free-riders might be disputed but there

seems to be unanimity over the fact that under-licensing constitutes a serious problem. The core of the latest revision of the German Packaging Ordinance was to address the risk of free-riding by suppressing self-compliance and tightening requirements for branch solutions. Another reason for the deviation in amounts of packaging is attributed to the high level of impurities. The sector inquiry by the Federal Cartel Authority estimates the amount of non-packaging thrown away with the lightweight packaging fraction of up to 35% (Bundeskartellamt, 2012). The Association of German Public Utilities confirms the high ratio of “mishrows”, but adds that in the mixed waste bins equal percentage of packaging is found. Consequently the two effects would even up and would not have such a dramatic influence on the abovementioned deviation. More importantly, they would indicate that consumers – whose participation plays a decisive role for the success of the system – are highly confused and that more municipal involvement is crucial for resolving the problem (L. Wagner, personal communication).

An issue arises also on the calculation method for recycling which results in the fact that both material and thermal recycling are counted. The German model of calculation is an “input” one, meaning that the amount of packaging material going into a recycling plant serves as a reference. However, it is argued that more than half of the separately collected input material of the plastic fraction is redirected to thermal recycling, so that in practice only 30 to 40% is materially recycled in the end (Franke, 2013). It is therefore suggested that calculation methods convey a much too positive picture and that the real rate of reuse of high-grade secondary raw plastic material would only amount to 20% instead of the reported over 40% (Baum, 2014). It can be noted that these figures do not take into account the one-way beverage bottles that are part of the DRF system under which plastic PET bottles largely fall.

The reliability of statistical data and the difficulty to trace back recycling and recovery flows – partly because of the number of actors and resulting contractual arrangements – is also noted as an issue. Some actors also point out that existing loopholes in the legislation and illegal behaviour compromise the credibility of the performance and the data presented (DUH, 2012). As industrial packaging waste is not part of the system and is not subject to targets or public control, there seems to be a grey zone between household and commercial & industrial packaging with risk of cherry-picking (O. De Clercq, personal communication).

As regards efficiency, the perceptions seem more unified. Without exception, all actors agree that the costs today are considerably lower than in the beginning years after the introduction of the dual system in Germany. It is argued that the costs have drastically dropped from two billion Euro in the mid-1990s to below one billion Euro nowadays (RecyclingNews, 2013a).

However, it must be acknowledged that the German EPR system for packaging was the first to apply the EPR concept for waste management at such a scale. In the starting years, DSD had to build a whole new system with no experience from the past. As described in Section 5.2, a number of mistakes have been made in its history and it neared bankruptcy on several occasions. The currently ten dual systems came on the market ten years later and were able to use an already existing infrastructure and experience, without having to bear the costs of making the mistakes that DSD did (J. Quoden, personal communication).

Part of the discussion on efficiency concerns the attributability of the cost reduction. It is debated whether cost reductions resulted primarily from the introduction of competition on the operational (waste management companies) or the system level (dual systems). The proponents of the latter explanation argue that competition on the PRO level has stimulated efficiency as PROs strive to attract customers through better service and lower fees. At the same time different sources point that the cost reduction came as a result of competitive

tendering for waste management service, first performed in 2003 when DSD was privatised and the long-term contracts mentioned in Section 5.2 were broken. In a report of the DG Competition (2005) the cost reduction resulting from the introduction of the first tendering procedure is assessed to be more than 20%, a report by the OECD estimates it is around 30% (2013a).

In any case, even if the costs have decreased considerably, some stakeholders argue that the saving effect would be in part offset by the clear increase of transaction costs (VKU, 2014). To make the calculation precise, the current estimates of the costs of the system would have to be added: administrative costs and profit margins of the PROs and transaction costs that are borne by all parties involved (VKU, 2014).

Austria

As regards effectiveness, the Austrian system does not appear to be subject of much debate. It is generally seen as achieving good results in terms of reaching the targets set in the legislation.

In terms of efficiency, the widely expected effect of competition that prices will drop might not realise in Austria, at least in the beginning. This is due to the changes in the legislation that will extend the financial responsibility of producers also to packaging waste that is found in the residual waste bin that come into effect at the same time as competition will be introduced (i.e. beginning of 2015). During the negotiations around the revision of the legislation, the Association of Austrian municipalities offered a special organisational scheme, according to which collection would be organised by the public waste management authorities (J. Mayr, personal communication). As already currently municipalities and associations of municipalities subcontract 95% of the collection activities to private actors, the model suggests the continuation of these practices under transparent public procurement procedures. It is proposed that costs for collection services are determined according to a standard cost calculation. The result of the suggested model would be collection 5% cheaper than it is performed by ARA currently. However, the suggested model was not appreciated by the producers and their political representatives (J. Mayr, personal communication). This implies that apart from cost considerations there are also other aspects (political interests, control concerns) behind the choice.

Further related to the issue of efficiency, many experts doubt that there is potential to achieve a competitive price difference. The PROs would share the same collection infrastructure and as Austria is a small country, there is a limited number of recycling facilities. It might be possible to export waste and treat it in neighbouring countries but for that, other considerations such as transport distances have to be taken into account (J. Mayr; G. Vogel; C. Stiglitz; personal communication). The concern is, therefore, that competition would rather affect the effectiveness of the system, as PROs reduce costs at the expense of environmental quality.

6.3 Transaction costs and administrative burden

Belgium

The presence of only one PRO in Belgium is seen as a big advantage in terms of simplicity and low costs for compliance on the part of obliged companies. As the procedures are already established, obliged companies are familiar with the process of compliance and it is already routine work for them.

There are only two options for obliged companies – either they join the only PRO or they organise take-back of their packaging individually. In the first case, obliged industry is relieved from reporting obligations on quantities and treatment of waste. These are taken on by Fost Plus who then has the incentives to control that its members pay their licence fees. Companies who opt for individual solution have to report to the IVCIE directly. With centralised organisational structure tracing material flows put on the market and licensed is rather straightforward and therefore chances for spotting free-rider behaviour are high. The presence of an enforcement body and the possibility for sanctions is seen as dissuading potential wrong-doing.

It is argued that system costs are kept to a minimum, as the PRO does not perform operations on its own. Instead, it subcontracts the activities to private or public waste management operators and, in doing so, takes advantage of the competition among the waste management operators.

Many stakeholders are involved in the system in a process of continuous dialogue, but there was no need to create additional entities except for the IVCIE. The IVCIE itself is said to operate with limited resources – it has a staff of 20 civil servants and a yearly budget excluding personnel costs of under 1 mln €.

Germany

Stakeholders appear to have a unified view concerning the transaction costs and administrative burden. They agree that having more than one PRO has led to increased complexity and associated costs. Where the views differ, is whether such an increase is justified and reasonable.

The Federal Ministry for the Environment and the Federal Cartel Office acknowledge that transaction costs related to the multiplication of actors and contractual arrangements have arisen, but they judge those to still be insignificant compared to the drastic decrease in overall costs described in Section 6.2. The obliged industry does not agree with accusations of high system costs and also puts forward the same argument of decrease in overall costs, which are attributed to technical innovation and organisational optimisation as a result of competition from private actors.

Some actors point at the increased efforts to monitor compliance and fight free-riders. However, these concerns are very much related to the provisions in the legislation, which give opportunity to producers to participate in branch solutions and in doing so, opens a loophole for various doubtful practices that are difficult to track down and control. This weakness is acknowledged and is being addressed in the latest amendment of the Packaging Ordinance (suppression of individual takeback). However, VKU argues that there are many other ways to shirk and the changes brought about by the last amendment would not bring a definite solution to the problem (L. Wagner, personal communication).

Since the liberalisation of the market, call for tenders for contracts concerning each single material group, divided into collection, sorting and recovery, have been issued independently of each other and in regular intervals. Each system concludes independent contracts with each waste management partner even if identical tasks are commissioned. Agreements and sharing of costs between the concerned parties are limited to the “absolutely necessary”, which is judged from the Federal Cartel Office point of view (VKU, 2014). The result is a complex web of contractual agreements between the parties. VKU has estimated that 20 000 individual agreements are today necessary to make the system function (2013). It is not difficult to lose

track in view of the complexity and also not easy to detect illegal behaviour. In that respect, strong regulation and good control become indispensable.

Austria

The last point is also supported by Austrian stakeholders. The stakeholders who were interviewed expressed the common opinion that they do not see the need for competition on the level of compliance schemes. Such competition would call for strongly regulated environment and will significantly increase administrative burden for municipalities and for other actors (J. Mayr; G. Vogel; C. Stiglitz; personal communication).

6.4 Transparency and other effects

Belgium

The not-for-profit character of the accredited organisation has implications for the transparency of the system and the equal treatment of its members (M. Adams, personal communication). The licence fees that the PRO charges are made public and are equal for all obliged companies.

In terms of dynamic effects, the fact that obliged industry is highly involved in the management of the system creates motivation to work together towards a long-term common goal. Industry sees its role as a dynamic player that wants to evolve and anticipate legislation instead of being pressed by it (F. Van Tiggelen, personal communication).

Germany

In terms of transparency, the views are mixed. Following the definition of Mickwitz (2003) for this criterion – to what degree are the processes observable to outsiders – a corresponding division of the stakeholders stands out. In fact, the “outsiders” largely perceive the system as non-transparent, while the “insiders”, namely obliged industry and dual systems themselves, do not see any transparency issues. And yet, the arguments brought by both are in some cases identical, but the way they interpret them is different. For instance, the fact that licence fees are not published but have to be asked for by interested parties, is seen as positive by dual systems and obliged companies, but seen as negative by other actors. Some actors are led to judge the level of transparency as very low because of the numerous contractual arrangements and the complexity of the system – to an extent that it becomes difficult to trace what is happening. The study by the Federal Cartel Office equally recognises that the sector is seen as non-transparent and too complicated, but sees such critiques as subjective and influenced by individual actor’s interests (Bundeskartellamt, 2012). It is pointed to the lack of solid information and this is what the study aims to provide. Still, it appears that the sector inquiry has spurred more controversy than it has brought clarity. Since its publication, several other studies, commissioned by several organisations and institutions have appeared (Baum, 2014; Di Fabio, 2014; VKU, 2013).

Issues around distributional effects and equity were raised by stakeholders external to the system. On the one side, it was pointed at the lack of level-playing field among PROs as some focus on high-value materials only. On the other side, lack of playing field can be equally observed at the level of the obliged industry. Multinational companies would have good prices as they are seen as attractive clients in view of the important quantities of packaging that need to be treated. However, this is usually not the case for small and medium-size enterprises.

The for-profit nature of PROs in Germany has subtle implications. Although system-management costs represent a small proportion of the total costs, what happens in practice is that the environmental fees that are ultimately passed on to consumers translate into profits for the shareholders of the PROs.

Austria

A controversial issue that is raised in discussions is that of ARA's financial surpluses which are judged too high to only serve the function of financial security against the uncertainties of a volatile market. Satisfying support of neither argument could be found, but the issue seems to point to insufficient transparency in the operations of the PRO. Further, the ongoing investigations of the EU Commission into possible abuses of monopoly power draw the attention the fact that, unlike in Belgium, there is no independent institution to oversee ARA and no rigid mechanism to avoid risks of monopoly abuse.

The new waste legislation setting the framework for the operation of competition from 2015 appears to create conditions for transparency in several respects. Unlike in Germany, there are obligations for reporting and disclosure of information. Also in terms of equity, certain provisions require PROs to treat their licence partners equally, no differentiation in prices and no rebates are allowed, unless justified on the grounds of objective reasons.

7 Key takeaways

Choice of fractions

Interesting observations stand out when comparing the choice of fractions for separate collection and the result of these choices. In Belgium high performance in plastic recycling is achieved while at the same time a limited type of plastic fractions are separately collected (only plastic bottles and flasks). This leads to a situation where the sorted material is able to finance up to half of the costs related to waste management operations. Even so, many actors are critical of the restricted collection of plastic packaging and are convinced that more should be done irrespective of the associated costs. In practice, as Fost Plus has targets to reach, it has focused on waste streams that allow it to collect and recycle enough materials for achieving those targets without taking care of other waste streams. Instead, other waste stream end up in the residual waste bin, and their collection and treatment is still financed by municipalities. It is therefore argued that solutions should be sought for all packaging materials, not only for the ones that are easy and profitable to treat. Apart from environmental considerations it is believed that enlarging the collection of the plastic fraction would also affect positively the sorting behaviour of citizens. Currently, it is considered that sorting instructions are not straightforward for citizens and result in confusion and incorrect sorting. A study conducted for Fost Plus in the end of 2010 had the purpose of assessing the effects of extending separate collection of packaging to other plastic types (Fost Plus, 2012). One of the findings of the study is that consumers are clearly favourable to a collection scenario as comprehensive as possible. However, the overall conclusion of the study is that for the moment an extension entails increased costs that do not compensate the benefits. This is due, among other factors, to additional costs for collection and sorting, reduced revenues from recyclers because of lower quality, absence of recycling sector for some of the new materials, uncertainties of the positive environmental effects and the expectation of only marginal increase of recycling rates. Nevertheless, it is acknowledged that several trends in the field of packaging, technology and recycling markets are capable of having an influence on these factors.

In Austria, small plastic packaging is excluded as it is not seen fit for high-grade recycling. As a result, 4% sorting residue from lightweight packaging is estimated to be rather low (Baum, 2014).

Germany has opted for a very comprehensive collection of the plastic packaging fraction and at the same time the high value packaging (one-way PET and glass bottles, metal cans) are totally excluded from the household collection system and are part of the deposit-refund system instead and are counted separately in terms of recycling rates. At the same time these fractions account for significant part of the high value materials collected in Belgium with the difference that in Belgium only high value materials are collected. Soft and thin plastics – which are not seen as attractive from an economic point of view – are excluded unlike in Germany. In Germany the comprehensive collection should in general present a clear advantage in terms of sorting instructions to the consumer (the fewer the limitations on what to throw away in the bin, the easier for the consumer to understand). However, the definition of packaging in the German Packaging Ordinance has been criticised to be quite complex for

the consumer to apprehend³⁵. The German municipalities observe high presence of impurities at the stage of collection.

Long-term orientation

When looking at efficiency, it is very important to consider that the systems are dynamic and need time to develop fully. As the three countries were among the first ones in Europe to have implemented such systems, it is interesting to note how costs evolved.

In Belgium, in the early years of Fost Plus the licence fees went up until full coverage of the whole Belgian territory was achieved. In the meantime, the recycling sector developed and as a result of this there was a bigger demand of good quality (selectively collected household packaging) material. Fost Plus is a not-for-profit organisation, consequently receiving more money from the sale of materials while incurring more or less the same operational costs, has led to an overall reduction of the Fost Plus licence fees in the long term (S. Claus, personal communication). A similar situation can also be observed in Austria, where the prices have decreased by 61% between 1995 and 2013 under the monopoly-based system of ARA (ARA, 2014).

As with every other business sector, there are temporary fluctuations related to changes in costs of energy and labour, or with economic downturn which affects the demand for selectively collected material for recycling. However, it appears that in the long term for the two countries the trend has been for prices to decrease as the market matured. The fact that there is only one PRO which is not-for-profit might play a role in that the licence fees reflect market developments. Further, as obliged industry from different sectors cooperate and are involved in the management of the PRO, this might foster their commitment and common long-term vision.

In comparison, the prices in Germany have only begun to markedly decrease after 2003 when the first tendering procedure was held. This highlights that additionally to the long-term vision and commitment, it is important to ensure functional competition on the operational level. The introduction of competition and the shift to a for-profit nature of the PROs implies that each obliged company assesses the offers of different PROs looking for its own benefit. However, it is not obliged to stay with that PRO for a long time but can change it at the next occasion. This is also the idea of competition – that market demand (i.e. demand coming from obliged industry) will drive efficiency among PROs as they have the pressure of being pushed out of the market if they offer services that are not attractive. However, if the main criteria obliged industry looks for is cost, then there should be some mechanisms to ensure that competition is not happening only on reducing costs as the risk is that this will be at the expense of quality.

Apart from the economic aspect, a long-term orientation is also important in the view of the ultimate goal of EPR and other environmental policies. In fact, the targets set in legislation are often outcome of political compromise and as such only set minimum requirements that are feasible to achieve in a specific period of time. The social optimum usually reflects a broader unformulated goal that requires long-term commitment to be achieved. A system that is long-term oriented should not only make producers of all packaging aware of their responsibilities, but should further give incentives and promote the use of more “sustainable” materials, i.e.

³⁵ A well cited example is the one of a clothes hanger – if it was bought as a support to a piece of clothing, it is considered as packaging and should be disposed of in the yellow bin. If it was purchased separately, it should find its place in the mixed waste bin. In both cases, the clothes hanger can be same physical object.

such materials that are easier to recycle and more likely to become a resource or input to a system. Such incentives can be achieved through differentiated licence fees.

Potential for a competitive price

The costs that PROs incur can be divided into several big parts: system-management costs (administrative costs for running the PRO) and operational costs consisting of collection, sorting, recycling and recovery of the packaging material. The PROs can further perform additional activities (awareness raising, support to companies to optimise packaging, audits). It is argued that for-profit PROs lack incentives to perform such additional activities as opposed to not-for-profit PROs.

As a rule, household collection infrastructure should not be duplicated. Hence, for considerations of efficiency gains competing PROs usually contract with the same collector and use the same collection services. In that sense, costs for collection are mostly fixed and identical for all PROs, depending on their market share and, possibly, individual negotiations with collectors. At the same time, collection costs represent a major part of the total costs.

Costs for sorting and recycling are comparatively lower and result from costs that sorting and recycling plants charge. If there are many such plants then there is a choice and bigger potential for cost differentiation. PRO negotiation power might also play a role. The power to negotiate is mostly determined by the quantity of material for treatment which in turn is related to the market share. For PROs with small market share this means that there is not so much leeway to achieve a competitive price. Conversely, high market share would give a PRO more power to negotiate. The effect would be similar to an effect from a procedure similar to public tendering. Cost differentiation might also be achieved if there is difference in the quality or the value of collected material. However, this should not be the case, as it would be equivalent to allowing cherry-picking and would mean that there is no level-playing field between the PROs.

As for the internal costs, the potential for price differentiation is seen as relatively low, as on the one hand these costs represent a very small percentage of total costs; and on the other, these consist mostly of personnel expenditures and the potential to reduce those is limited.

Figure 7-1 presents in a simplified but systematic manner the conditions where the potential for cost differentiation is realised.

Costs for	Consisting of (potential for cost differentiation)	Is the potential realised?
Running the PRO (System-management costs)	Personnel costs: sales and marketing, IT, communication, contract negotiation, contract writing, etc.	Minimum number of staff is needed → no Very small percentage of total costs → no
Collection and sorting	Collection infrastructure is fixed and should not be duplicated	PROs are forced to use the same collection infrastructure → no
	Collection and sorting are often done in one step	→ no

	If there are many sorting plants that offer differentiated prices themselves	If transport distance is insignificant → yes If transport distance is significant → no
Recycling and recovery	If there are many recycling/ recovery plants that offer differentiated prices themselves	If transport distance is insignificant → yes If transport distance is significant → no
	If producers are able to negotiate	Based on quantity → yes Based on quality and value → no

Figure 7-1: Potential for a competitive price

Whether transport differences are significant will depend, on the one hand, on the size of the country (if it matters whether waste is treated nationally) and on the other on the characteristics of the waste (weight and value).

As mentioned above, in the case when producers are able to negotiate based on quantity, it is questionable whether it makes sense to have many PROs with a small market share. Alternatively, few PROs with a big market share that have high negotiating power relative to waste management operators is seen as close or equivalent to a situation of a single PRO conducting procedures similar to public tendering.

Overall, the argument from economic theory that competition among PROs would result in greater efficiency does not appear to be a very convincing one when it comes to practice. Many stakeholders see the advantage of having competing PROs in that they tend to offer lower prices. In practice, the potential for lower costs is realised under very limited circumstances (as illustrated in Figure 7-1) and in cases competitors do offer lower prices, these might be due to several other reasons. Such reasons can be extensive use of loopholes in the legislation; cross financing between materials and services; cherry-picking; price undercutting by incurring losses in the market entry phase to gain market share (usually, prices are then increased later on); cutting expenses for additional activities such as awareness raising campaigns or assistance for companies to optimise their packaging.

Clearly, the possibility for ensuring compliance at the lowest possible cost is determined by the existence of competition on the level of waste management operators much more than by efficiency gains from competition on the PRO level.

Role of municipalities

From the Belgian experience, there are a number of arguments in favour of the involvement of municipalities especially for collecting the packaging waste from households. These go largely in line with the arguments presented in the literature review in Section 3.1. In particular, the role of municipalities with respect to communication and interaction with citizens is seen as crucial (see next section).

Further, it is seen that involvement of municipalities has the potential to increase transparency and performance in several ways. On the one hand, municipalities are controlled for results and quality by the PRO, given that the conditions and terms of agreement are set beforehand. This is especially relevant in cases where there are risks that municipalities want to protect

their investments in infrastructure (such as incinerators). The other way round, if municipalities are responsible for collection then they control the infrastructure, either directly or through private collection partners, and ensure that the PRO is not abusing its (dominant) position or is not cherry-picking. Further, municipal involvement allows for regional specificities to be optimally addressed and implies territorial coverage and equitable treatment of households. The harmonised and coordinated delivery of collection services also has the potential to exploit logistic synergies between packaging and other waste streams.

If collection is performed by the municipalities, industry often fears inefficiencies. It appears necessary to create mechanisms in order for obliged companies (who are main financial contributors in line with the EPR principle) to be able to influence the costs. In Belgium this issue is resolved by establishing standard cost scenarios – municipalities would not receive higher compensation than what has been agreed and what reflects the current market cost for the delivery of the service. The same approach is advocated by the Associations of public waste management companies in Germany and Austria (L. Wagner; J. Mayr; personal communication). During two of the interviews with obliged companies, France was mentioned as an example of a country where producers do not have control over what municipalities charge them for collection services and, as a result, collection costs are seen as “excessively” high.

On the other hand, if municipalities do not perform collection themselves, they can still be involved in choosing the contract partner. This would have the advantage that municipalities can co-determine contract conditions and ensure quality of service or coordination with other waste streams. However, if they are small, then there is a potential risk of imbalance in terms of negotiating power against the contractor. In such a case, it might be beneficial for the PRO(s) also to be involved.

In both cases – collection performed by municipalities themselves or through private waste management operators – there should be good control of the costs, so that the parties financing the system pay a reasonable price for the delivery of the service, and guarantee of the quality.

Consumer participation

Undoubtedly, consumers play a decisive role for the system to work through their decision to sort packaging waste. Availability of and access to separate collection facilities is a prerequisite. All three countries analysed have comprehensive collection infrastructure so this aspect does not seem to be relevant. Convenience is also decisive and would optimally be taken into account already in the planning phase of the system or defined by the legislator under some form. Regarding convenience, municipalities might be best placed to understand and cater for the needs of the inhabitants, as they very often get direct feedback whether inhabitants are satisfied with collection infrastructure or not.

What is further acknowledged to be crucial is public awareness and participation so that the collection facilities in place are also used and are used in the right way. Consumer behaviour cannot be stimulated by each PRO individually but has to be addressed in a coordinated way. In fact, consumers are usually unfamiliar with EPR policies and are unaware that there might be several operators behind the collection bin for packaging waste. They commonly associate household waste collection with their municipalities. Many stakeholders therefore acknowledge that municipalities are key actors with regards to communicating to consumers on the importance of separate collection and how to use the collection infrastructure in the right way. Municipalities are especially important also in view of the fact that very often waste

collection differs regionally (both in terms of infrastructure and of what is collected where) and they are the actors with the most relevant knowledge of the local situation.

In Germany and Austria, collection can differ substantially within and between the federal states (E. Mink; J. Mayr; personal communication). Such diversity has the effect of multiplying communication which is not in favour neither of the consumers who might get confused, nor of the industry which has to bear the costs (E. Mink, personal communication). It is more beneficial to have communication which is standardised as much as possible countrywide. In that respect, many actors agree that there is clear advantage of having a single PRO instead of competing ones as it would collect funding and work towards delivering a consistent message to the consumers. In the case there are competing PROs, this would not be possible, and communication would be managed by an independent third party. This party would have to handle information from the competing PROs and coordinate with municipalities.

It is also emphasised that communication to the citizens should not only restrict to correctly sorting their used packaging. Instead a comprehensive approach should be taken and consumers should also be made aware of the wider environmental context and of the importance of preventing waste in the first place, of reusing packaging when possible, etc. It is often perceived that the presence of multiple profit-seeking PROs compromise the effectiveness of such communication either because it implies costs that PROs would rather not incur or because they are driven by profit motives and do not have the incentives to engage in such initiatives. Critical discussion also arises in cases when municipalities themselves have limited interest in promoting separate collection (for instance, if they own incineration facilities which require constant input of waste). Such consideration on the part of public and private actors indicate the need for setting clear rules and environmental standards and making sure that there is an effective system for controlling and enforcing those.

Although not in the scope of the current thesis, it was suggested on several occasions by various stakeholders that it cannot be counted on EPR alone to motivate consumers to sort out their waste. It is argued that further incentives, for instance in the form of pay-as-you-throw schemes, are equally important and play a role.

Importance of having clear rules and mechanisms to enforce them

IVCIE in Belgium acts as a referee and sets the rules, through a process of dialogue where different stakeholders are involved and have their say. Afterwards, everyone has to follow the rules and there is no room for much negotiation as everyone has to abide by the rules that they agreed upon. The rules govern not only the operations of the Belgian PRO, but apply also to other actors involved in the system (for instance, the amount that municipalities get reimbursed for collection services in case they perform these in-house). The IVCIE is also able to enforce sanctions – this gives it additional authority. In Germany, there is no such body and no stable mechanism to monitor and enforce the rules (as exemplified in Table 5-6). This might be related to the federal division and the size of the country, but in any case the consequences are felt – significant under-licensing and high proportion of free-riders, leading the system to a situation close to financial collapse (FAZ, 2014).

Apart from legislation which is clearly core, one further means to set rules is through formal accreditation or authorisation of the PROs, in the process of which certain conditions for its functioning are included. It is subsequently important that the rules are also enforced and the presence of an independent body with authority is one way to guarantee enforcement. With regards to the fact that the private consumer ultimately determines the success of the system without necessarily having a say in its actual functioning, it seems beneficial to establish rules

that take consumers' perspective into account (such as rules on minimum provision and financing of collection bins per certain number of inhabitants).

Transparency

As outlined in Section 2.3 in the definition of transparency as criterion, the level of transparency can influence the impact and, consequently, the effectiveness of a system, but also other aspects of its functioning. In the example of Germany, the complexity of the system and the fact that the competing PROs release only restricted information because of business secret considerations has stimulated free-riding behaviour. Such behaviour undermines the effectiveness of the system and increases administrative burden for controlling and sanctioning violations. The low level of transparency makes it difficult to track and generate reliable solid data. In turn, such lack of objective information creates uncertainties, opens room for politically driven statements and alienation and can ultimately erode the trust in the system. In opposition, as demonstrated by the Belgian example, transparency was present from the beginning, and has contributed to solidifying the system over the years. Such transparency increases trust not only nationally, but also among actors outside of the country.

8 Conclusions

EPR-based policies are seen as effective by policy makers and are applied in different contexts and for a variety of product groups. Packaging is a typical waste stream addressed by such policies. When implementing EPR policies, a common practice is the creation of one or several Producer Responsibility Organisations (PROs). Currently, however, there is lack of understanding of whether competition on the PRO level is beneficial or the opposite. There are also uncertainties around the issue of allocating responsibilities between industry and municipalities (which were traditionally in charge of waste management activities). The two aspects – competition among PROs and role of municipalities under an EPR system – are very topical and important with respect to EPR implementation. Several European countries have recently or are currently in the process of changing their EPR and/ or waste management systems, shifting from one PRO to competition, from more municipality involvement to less and vice versa. There is no single pattern of these changes which suggests that people are lacking good understanding of the implications of various choices. At the European level, very often conclusions are drawn based on statistics which do not give the best picture of how things look like in reality.

The purpose of this paper was to contribute to a better understanding of the consequences of various choices in relation to the two aspects mentioned above and help policy-makers take more informed decisions.

8.1 Revisiting the research question

It was decided not to focus on countries which have the biggest problems. Instead, the approach taken in the paper was to analyse a few countries seen as the best performers and try to learn from their experiences. Three countries were chosen based on their perceived high performance by a number of practitioners in the area of EPR and also based on available statistical data. The three selected countries are Belgium, Germany and Austria. It was not attempted to perform a real comparison of the systems established in the three countries. Rather, the aim was to learn from the achievements and challenges met by the systems, relying to some extent on how they are perceived and evaluated by concerned actors in the three countries.

The following research question was formulated to guide the research:

What are the implications of the (absence of) competition on the PRO level and involvement of municipalities in the EPR systems for household packaging waste in Belgium, Germany and Austria?

It was found that for Belgium, the opinions of the stakeholders largely coincide – both the presence of one single PRO and the involvement of municipalities at the stage of collecting the waste and communicating to consumers are regarded positively. Far from it being a straightforward explanation, there are range of factors that contribute to the perceived success of the system. Among these, the following can be mentioned:

- Stakeholders engage in regular dialogue, on which decisions are taken and agreements are based. Differing interests are taken into account and compromise is sought that would satisfy all parties in terms of general orientation (there is still room for discussion on small details). The framework and the rules are thus clear for everyone

and are respected. In cases where there are doubts or different interpretations, a public body acts as a referee to resolve the issues and ensure compliance.

- Obligated industry is highly involved in the general management of the system. It is subject to the same requirements and is led to work together within a not-for-profit PRO. This allows industry to adopt a long-term orientation and stay dynamic. It is interested in making the system evolve and continuously improve system performance in order to keep up with legislation. This point is especially important for industry because of the federal division of the country and the incentives to keep the harmonised functioning of the system nationwide.
- Involvement of municipalities is seen as yielding very positive results. Collection is organised in close cooperation between the municipalities and the PRO, whereby quality of the service is important. Both the municipalities and the PRO are engaged in comprehensive communication campaigns that also cover out of home consumption. Critique is voiced to the restricted choice of plastic packaging waste that is collected. The rationale for the choice was the suitability for high grade recycling, however, options are considered of how to expand that fraction.
- High level of transparency on all activities and operations has always been a feature of the Belgian system. Transparency is characteristic also of the tender contracts that are carried out and granted according to clear procedures similar to public tendering. This contributes to ensure effective competition on the operational level which ultimately covers approximately 90% of all costs.

For Germany, stakeholder views are rather divided. The impression that one gets from analysing stakeholder statements, is that the divergence in opinions is to varying extent underpinned by political interests. Nevertheless, there are some points that can be noted:

- It is widely acknowledged that compared with the years when there was still a monopoly on the PRO level the costs of the system today with ten competing PROs are significantly lower. However, voices are raised with regard to the attributability of the cost reduction to competition on the PRO level. The question of whether cost reductions resulted primarily from the introduction of competition on the operational (waste management companies) or the system level (dual systems) seems to be a relevant one.
- Further perception concerns the increased administrative burden and transaction costs. All stakeholders agree that these have risen as a direct result of the introduction of competition at the PRO level but there are somewhat mixed opinions on whether the rise is justified. It is pointed at the issue of free-riders and the increased efforts to monitor compliance. The need of effective legislation with clear provisions is acknowledged for ensuring level-playing field for all actors on the market.
- From the perspective of the municipalities³⁶, the higher number of PROs leads to coordination and organisation problems that are also felt by citizens. As a result, complaints related to the quality of the collection have regularly been addressed to

³⁶ On the part of German municipalities, a strong critique is voiced in relation to several aspects of the current system. In line with the purposes of this thesis, one of the issues is brought up in the conclusions.

municipalities in the last years. In the interest of the citizens, it is therefore argued that organisation of collection should be allocated to municipalities.

- There are many aspects for which stakeholder views differ widely. It is difficult to establish reliable data to support either side (because of political interests, unavailability of public information, compromised credibility due to illegal behaviour). Lack of transparency is therefore seen as posing serious difficulties.

In Austria, limited number of stakeholders were interviewed personally, for the rest information was sought mostly from internet-based sources. On the basis of the interviews that were conducted, it appears that competition among PROs is generally not seen as beneficial. Those in favour of competition are PROs that are planning to enter the market as they see potential for profits. However exactly this potential is questioned by municipalities, the incumbent PRO and academics, as well as from several actors outside of Austria. They predict that the introduction of competition from the beginning of 2015 will lead in the long run to the presence of a limited number of PROs which will not be able to offer a price difference to their customers of more than one or two percent. What is expected with near certainty that competition will bring about is a great increase in complexity and transaction and administrative costs for all actors involved in the system.

8.2 Contribution to the purpose

The choice of a system and the way it is designed depend on many factors such as national context, historical developments, political priorities, differing ambitions. For instance, in Belgium the success of the system is determined, among other factors, to some extent by the tradition of stakeholder consultation. In Germany, it is argued that the size of the country requires other solutions than elsewhere and that cultural specificities also play a role (affinity for perfectionism and complex organisation). Nevertheless, on the basis of the experiences of the three countries, some general conclusions could be drawn.

It appears that the general benefits of competition are realised without competition among PROs as what is really important in terms of costs is the collection and treatment – this is where generally 90% of total costs occur – not for running the PRO per se. Therefore, it is important to ensure effective competition on the operational level and a well-functioning market for recyclable materials.

Competition at system level adds a lot of complexity which often opens up possibilities for avoiding legislation and neglecting obligations. If there are competing PROs, strong enforcement and strict control is therefore essential. However, these in turn increase the administrative burden and transaction costs.

In the case of competition among PROs mechanisms are needed to divide the responsibilities between them and aggregate information (establishing market shares, dividing collected materials for further treatment and additional costs accordingly, verifying the correctness of reported data, etc.). Again, the establishment and proper functioning of such mechanisms require certain resources. On the other hand, in the absence of competition, most of these tasks are performed by the single PRO.

Still, in the case of a single PRO there are risks that it concentrates power and abuses its monopoly position. Therefore, it is important to ensure that mechanisms are in place for avoiding such risks. Not-for-profit status is one way to guarantee against abuse of monopoly, but it might not be enough. Requesting high level of transparency of the way the PRO is run

is also important – for instance through disclosing information on internal costs and calculation of licence fees, accountability to the shareholders, reporting to public authorities. There should be a possibility for obliged companies to influence the system and in that respect involvement of industry in the management of the system is seen as a good way of controlling the PRO. However, commitment of industry is also important. Control on the part of public actors is also an option. Requiring equal treatment of obliged companies would ensure that small producers are not disfavoured. Ideally this aspect would be pushed to the extent that licence fees are made public.

Transparency is in any case seen as crucial to be able to assess the actual performance of the systems and to establish objective information.

As regards involvement of municipalities under the EPR system, their role in interacting with citizens and informing them about the importance of separation and the correct way of using the collection infrastructure appears to be crucial. There are also strong arguments in favour of municipalities being involved in collection. It is not necessary that municipalities perform collection themselves. What counts is that they are able to have influence on the delivery of a service for which they are seen as responsible in the eyes of the citizens. If municipalities perform collection or waste treatment activities then this should be done under market conditions. Otherwise, each case should be evaluated individually in view of the level of competition among private waste management operators and the relative bargaining power of municipalities.

8.3 Suggestions for future research

The research has only looked at three countries. However, in the course of the interviews, examples of other countries were brought up. Expanding the research and analysing other countries as well might provide valuable insights into what the determinants are for different systems to develop and evolve. A wider study of the systems that have been first set up in Europe and consequently have the longest experience would be particularly interesting in that respect.

Several stakeholders raised the question of what responsibilities should be assigned to industry – is financial responsibility enough or should it be involved in other ways as well. Recognising that the original idea of EPR is to ultimately promote environmental improvements in products, it would be interesting to look more in depth into how different designs of an EPR system have an effect on behaviour and decisions of producers. In particular, research would be beneficial into whether in the case of a single PRO where the producers are in charge of managing it, the incentives for them to improve their packaging are higher than if there are competing PROs where producers only contribute financially. More detailed research could also look into how these effects are different between big producers (multinational companies) and smaller one (small and medium-sized enterprises).

An interesting line of research would be to analyse the nature of cost reductions in an EPR system. As these systems are dynamic and need time to develop (operational experience, recycling markets, change of mindsets..) it is interesting to see whether competition is needed to achieve cost reductions (the main argument for introducing competition) or if all the system needs is time (given that there is strong regulatory framework and a number of side conditions).

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Appendix I – Revision of the German Packaging Ordinance

Revision	What changed
1 st Amendment of the Packaging Ordinance – August 27, 1998	<p>Introduced provisions allowing for “self-compliance”</p> <p>Licensed packaging was taken as reference value to determine recycling rates, as opposed to the previous situation where the marketed amount of packaging served as a reference.</p>
2 nd Amendment of the Packaging Ordinance – May 15, 2002	<p>Only amending the rules for heavy metals in glass packaging.</p>
3 rd Amendment of the Packaging Ordinance – Mai 24, 2005	<p>Introducing some new regulations for the mandatory deposit for one way beverage containers.</p>
4 th Amendment of the Packaging Ordinance – December 30, 2005	<p>Introduced the increased recycling quotas and regulations of the revised European Packaging Directive and amended several paragraphs to adapt the Ordinance from a monopolistic to a competitive approach.</p>
5 th Amendment of the Packaging Ordinance – April 2, 2008	<p>Core of the revision was to ensure the financing of the kerbside collection system by dual systems, increase transparency, stop free-riding and improve the framework for competition. Self-compliance was removed, but the possibility of so called self-takeback and branch solutions was introduced. In principle, all sales packaging ending at the private end consumer had to be licensed with a dual system, but in the case an obliged company could prove that it has taken back and recovered its waste individually or through a branch solution, it would get its licence fees reimbursed.</p> <p>The 5th Ordinance requires also the establishment of a Coordination Body.</p>
6 th Amendment of the Packaging Ordinance – July 17, 2014	<p>Introduces some changes in the definition of packaging to align it with EU legislation (in particular, the EU Commission Directive 2013/2/EU)</p>
7 th Amendment of the Packaging Ordinance – July 17, 2014	<p>Core of the revision is to address the loopholes with respect to self-compliance and branch solutions, create conditions for fair competition and stabilise the system.</p> <p>The possibility for self-compliance (i.e. producers who reclaim back the licence fees they paid because they organise the take-back of their packaging at point-of-sale) will be ruled out starting from October 1st, 2014.</p> <p>Apart from that, the requirements for branch solutions will be tightened. Companies will be able to use this option, but with several restrictions: the sites where packaging waste occurs will have to confirm their participation in writing. The packaging from those sites will have to be accurately documented. These regulations will come into force on January 1st, 2015.</p>

Source: (BMU, 2014; Di Fabio, 2014; J. Quoden; personal communication)

Appendix II – List of interviews

Institution	Person and position	Date ³⁷
ARGE Österreichischer Wirtschaftsverbände (Working Group of Austrian Municipal waste management Associations)	Johann Mayr, Country coordinator	2014-06-23 Personal meeting
ARA Altstoff Recycling Austria	Christian Stiglitz, former Managing Director	2014-06-24 Personal meeting
Avfall Sverige (Swedish Association of Waste Management)	Weine Wiquist, Managing Director	2014-06-06 Skype conversation
Danone	Philippe Diercxsens, Packaging and environment Manager	2014-07-29 Personal meeting
DETIC Association Belgo-Luxembourgeoise des producteurs et des distributeurs de savons, cosmétiques, détergents, colles et mastics (Belgian-Luxembourg federation of adhesive and sealants manufacturers and distributors)	Françoise Van Tiggelen, Secretary General	2014-07-28 Personal meeting
DSD – Duales System Deutschland GmbH	Helmut Schmitz, Head of public affairs	2014-03-05 E-mail communication
European Commission DG Competition	Sandra Kijewski, Policy Officer	2014-07-30 Phone call
European Commission DG Environment	Olivier De Clercq, Policy Officer	2014-07-25 Personal meeting
EXPRA – Extended Producer Responsibility Alliance	Joachim Quoden, Managing Director	Numerous communication
FEB – Fédération d'Entreprises en Belgique (Federation of Enterprises in Belgium)	Vanessa Biebel, Advisor environment	2014-07-23 Personal meeting
Fost Plus	William Vermeir, Managing Director Youri Sloutzky, Public relations & Public affairs Manager Steve Claus, Business Relations Manager	2014-07-25 Personal meeting
IIIIEE – International Institute for Industrial Environmental Economics	Thomas Lindhqvist, Associate Professor	Numerous communication
INTERAFVAL – samenwerking VVSG en intercommunales (Cooperation of the Association of Flemish Cities and Municipalities and Intermunicipal Waste Management Organisations)	Christof Delatter, Coordinator and member of staff waste management	2014-07-18 Personal meeting
IVCIE – Commission Interrégionale de l'Emballage (Interregional Packaging Commission)	Marc Adams, Acting Director Hugo Geerts, Full member of the DMB (Flemish region)	2014-07-22 Personal meeting 2014-07-29

³⁷ Most interviews were conducted during the summer period of 2014. Some interviews were conducted earlier during the year as part of a research project analysing only the effects of competition on the EPR system for household packaging waste in Germany.

	Martine Gillet, Full member of the DMB (Walloon region)	Personal meeting
OECD – Organisation for Economic Cooperation and Development	Peter Börkey, Senior Policy Analyst	2014-08-05 Skype conversation
Öko-Institut Institute for Applied Ecology	Günther Dehoust, Deputy Head of Division Infrastructure & Enterprises	2014-03-11 E-Mail communication
SITA Belgium	Yves Decelle, Project Manager	2014-07-24 Personal meeting
Tetra Pak	Erika Mink, Global Director Environment and Public Affairs	2014-09-02 Personal meeting
Verbraucherzentrale Nordrhein-Westfalen (Consumer advice centre)	Friederike Farsen, Group for the Environment	2014-04-01 E-Mail communication
VKU – Verband Kommunaler Unternehmen e.V. (German Association of Local Public Utilities)	Walter Hartwig, Chairman of the Expert Committee Dual Systems within VKU Linda Wagner, Policy Officer EU Waste Policies	2014-03-10 E-Mail communication 2014-07-24 Personal meeting
Wirtschaftsuniversität Wien (Vienna University of Economics and Business)	Gerhard Vogel, Professor Emeritus	2014-06-23 Personal meeting
Wuppertal Institute for Climate, Environment and Energy	Henning Wilts, Project Co-ordinator	2014-03-03 E-Mail communication