PET bottles: From waste to resources

How circular economy transforms waste management practices in Buenos Aires

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Abstract: Circular Economy has become a promising sustainability concept among scholars and practitioners. This is because circular economy replaces linear productive systems and enables the achievement of economic and social objectives while minimizing the environmental impact. Building on the market-as-practice literature we investigate how circular economy is transforming waste management practices for PET-plastic bottles in the metropolitan area of Buenos Aires (GBA), Argentina. Although researchers have investigated the emergence of circular economy in more established markets, circular economy as a transformer of market practices in less developed settings has so far received little attention. To address this theoretical gap, we conducted a qualitative study interviewing market actors and making observations in the field. We find that circular economy is transforming the waste management practices of the market for PET bottles in GBA and that although a myriad of sustainability activities are taking place, multiple views on circular economy still render the direction of circular economy development unclear.

Keywords: Circular Economy, PET bottles, Argentina, Markets-as-practice, Multiplicity.
Supervisor: Nurgül Özbek

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Glossary and Abbreviations

Buenos Aires Province (BA): One of 23 provinces in Argentina.

Cartoneros: People working with collection of recyclable materials with various levels of formality. Can work independently or connected to cooperatives.

Circular Economy (CE): An economic system that replaces the 'end-of-life' concept with reducing, reusing, recycling and recovering materials in the production, distribution and consumption processes.

Ciudad Autónoma de Buenos Aires (CABA): Autonomous district. The capital city of Argentina and geographically located next to BA.

Extended producer responsibility (EPR): Legislation stipulating producers' physical, legal and financial responsibility for the waste management of their products.

Gran Buenos Aires (GBA): Big Buenos Aires, a metropolitan area integrating CABA and 24 municipalities from the province of BA.

Linear Economy: An economic system where natural resources are used and processed in a variety of ways and after being consumed, disposed of in the form of waste out of the economic system.

PET Bottles: PET plastic containers often used for beverages

Polyethylene Terephthalate (PET): Major plastic type used in the production of beverage containers.

Recycled Polyethylene Terephthalate (rPET): Recycled PET.

Urban Collectors: Cartoneros that are formally organized in cooperatives.

Waste Management: Involves the prevention of waste production, collection, transportation, treatment and disposal of waste and the control, monitoring and regulation of those activities.

1 Introduction

During the last decades, the debate concerning the sustainable use of natural resources has intensified. Alarmingly, according to the latest publication of the Global Footprint Network (2018) during 2014 humanity consumed the natural resources of 1.7 earths and the figure continues to grow. In other words, our consumption highly surpasses Earth's capacity to regenerate (renewable) natural resources (Lin et al., 2018). Experts and researchers across numerous academic fields have already emphasized that in order to develop a sustainable use of resources a change in the hegemonic economic system is needed (De Wit et al., 2018; MacArthur, 2013). This change is a movement from a linear-economy to a Circular Economy (CE). While a linear logic implies taking resources from nature and disposing of them as waste out of the economic system, CE assumes that resources are finite and reintroduces post-usage resources in the economic system. Therefore, CE creates value out of waste and enables a sustainable use of resources (De Wit et al., 2018; Lovins et al., 2014; MacArthur, 2013). Although a movement towards CE is taking place around the world, the degree to which CE practices have materialized varies highly in different markets (Geng and Doberstein, 2008; Gregson et al., 2015; Laurenti et al., 2018). While some markets have managed to achieve high development levels of CE, a majority of them still apply a linear logic (Geng and Doberstein, 2008; Laurenti et al., 2018). Therefore, understanding how to generate a transition towards CE seems to be of utmost importance.

The transition towards CE requires a market transformation. Recently, an increasing number of scholars have started to study market transformation as a result of the interrelation of market-shaping practices (Kjellberg and Helgesson 2006, 2007; Storbacka and Nenonen, 2011). Although previous discussions have recognized the systemic character of markets (Giesler, 2003; Layton, 2007; Leontief, 1974; Lindblom, 2002; Lusch and Vargo, 2011), the view that markets are configurations of market-shaping practices performed by actors interconnected by networks is fairly recent (Andersson et al., 2008; Araujo et al., 2008; Kjellberg and Helgesson 2006, Kjellberg and Helgesson 2007; Storbacka and Nenonen, 2011). According to this view, markets are plastic entities in constant change (Nenonen et al., 2014). Building on this theoretical perspective, we argue that the development towards CE in markets requires shaping existing economic systems and market practices that are based on the linear approach. Provided that the markets as practice theory views change as the result of the interrelations of market-shaping practices, the identification and analysis of these practices and their interplay will enable us to produce a clear and practical understanding of how new CE markets are shaped (Kjellberg and Olson, 2017).

Recent literature on CE has focused on its adoption by studying the drivers and barriers enabling or hindering CE (Geng and Doberstein, 2008; Gregson et al., 2015; Laurenti et al., 2018; Ritzén and Sandström, 2017), the impact of CE on business models (Bocken et al., 2016; Velenturf and Jopson, 2018) and also the impact of CE on markets (Geng and Doberstein, 2008). Although this literature has provided interesting ideas about market change, few studies have explored a systemic perspective that describes how different market-shaping practices interrelate to influence the adoption of CE. Additionally, current research on the topic has taken an institutional theory perspective, describing the regulations, norms and cognitive cultural aspects that characterize institutions (Hawkins and Muecke, 2002; Ranta et al., 2018; Stahel, 2013). We argue that such a

perspective characterizes markets as stabilized structures and ready-made, and that in order to discuss how markets are being continuously transformed and configured, it is important to study markets in the making, meaning through the specific practices that create them (Kjellberg and Helgesson 2007).

1.1 Purpose and research question

The purpose of this study is to investigate how CE is transforming the waste management practices of the market for plastic polyethylene terephthalate (PET) beverage containers (bottles) in the metropolitan area of Buenos Aires (GBA). Building on a conceptual framework on *markets as practices*, we use three interlinked types of practices - normalizing practices; representational practices and exchange practices - to analyze how they enact markets and how in doing so, they influence the market configuration. We conduct interviews in the field and observe different practices and ideas among market actors that influence movements towards CE. The study aims to fulfil the purpose by examining the following research question:

How is Circular Economy transforming the Waste Management practices of the market for PET Bottles in GBA?

1.2 Contribution

By investigating CE progressions with a market-as-practice perspective, we aim to deliver relevant insights for both researchers and practitioners. For researchers, we aim to (1) contribute to the *markets-as-practice* literature by analyzing the adjacent field of CE and by (2) describing how CE influences different *practices* in a market in the making. We also aim to contribute by (3) analyzing how multiple views on CE shape the market and how these are coordinated. For practitioners, (4) a system approach could help market actors understand how market practices interrelate to shape market configurations and therefore enable them to devise new ways to shape markets.

1.3 Delimitations

We delimit our research to waste management practices for PET bottles in GBA. First, we argue that it is relevant to focus on plastic packages as only 14% are collected resulting in a resource waste of n 80-120 USD (MacArthur, 2018). Furthermore, plastic packages represent the plastic application with the highest environmental impact (OECD, 2015). One of the major plastics used in packages is PET, mainly used as single-use-container for beverages (bottles) (MacArthur, 2018). According to recent reports, PET has insufficient recycling rates and the shortest lifetime of the major plastic materials (OECD, 2015), creating a need for circular solutions and rendering this an interesting field to study. Second, we delimit the scope to one geographical market, GBA in Argentina. Despite being the economic center of the third richest country in the region (OCED, 2017), recycling practices in GBA are lacking and hence most urban solid waste ends up in landfills (ONGIRSU, 2016). Similarly to other Latin American cities, GBA provides a good example of a geography where waste management practices are still highly underdeveloped and CE could be further applied (World Bank, 2018). Finally, waste management plays a central role in CE as proper categorization, efficient handling, and processing in the extraction of resources from used

materials, can help minimize leakages outside the resource loop and therefore reduce the extraction of virgin natural resources (Taelman et al., 2018). As argued by Wijkman and Skånberg (2015), a CE focusing on waste prevention is a prerequisite for staying within planetary boundaries and minimizing environmental externalities.

1.4 Thesis outline

The thesis will be organized in the following way (*Figure 1*):

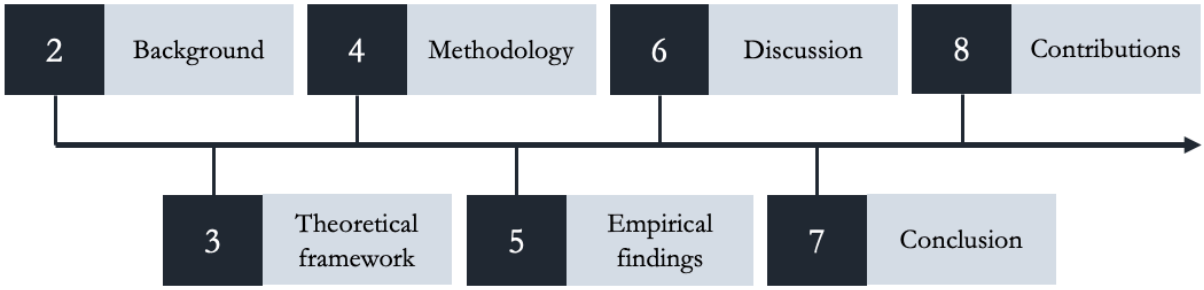


Figure 1: Thesis outline

2 Background

To provide a background to the research, the next chapter will (2.1) explore the literature related to CE, (2.2) the practices related to CE and (2.3) an introduction to waste management in GBA.

2.1 From a Linear to Circular Economy

Human activity has always been connected to the environment and highly dependent on natural resources. From the beginning of the industrial revolution until today, dependence on natural resources has been characterized by a linear approach to waste management. As visualized in *figure 2*, this approach is based on the extraction of natural resources, which are processed in a variety of ways and after being consumed disposed of in the form of waste.

Figure 2: The linear approach to resource management

CE scholars argue this 'take-make-dispose' approach is extremely inefficient since the inflows that once were valuable resources are transformed into worthless waste, depleting earth resources and often polluting the environment (Kirchherr et al., 2017; Lovins et al., 2014; van Buren et al., 2016). During the past decades, the linear paradigm along with the high population growth and urbanization has put higher pressure on the environment and increased visible negative externalities such as signs of resource scarcity, growing amounts of waste and increased CO2 emissions (MacArthur, 2013). This situation has concerned scholars and practitioners who advocate for an approach that decouples environmental pressure from economic growth and thus allows for sustainable development (Ghisellini et al., 2016; MacArthur, 2013; van Buren et al., 2016; van Griethuysen, 2010).

As a result of the limitations of linear economies, the opportunity to adopt a CE approach that enables the operationalization of sustainable development has been widely discussed (Ghisellini et al., 2016). The concept of 'Circular Economy' is rooted in previous research within ecological economics (Boulding, 1966), industrial ecology (Stahel and Reday-Mulvey, 1981) and environmental economics (Pearce and Turner, 1990). The CE field has drawn important insights from previous concepts such as "Spaceman economy" (Boulding, 1966), "Closed loops" (Braungart et al., 2007; Stahel and Reday-Mulvey, 1981), "Industrial symbiosis" (Chertow, 2000) and "Cradle-to-cradle" (McDonough and Braungart, 2002;). More recently, CE has also gained attention in practice, where policymakers and international organizations such as the Organisation for Economic Co-operation and Development (OECD), the European Commission/European Union (EC/EU), and the United Nations (UN) had drawn upon such concept to create guidelines and regulations (EC 2018; OECD 2017; UNCTAD 2018). In the past decade, the Ellen MacArthur Foundation along with other NGOs have popularized the concept of CE and created awareness among a wide audience (Linder et al., 2017; Stahel, 2013).

Presently, there is no commonly accepted definition of CE (Yuan et al., 2006) and for the purpose of this thesis we will take the definition elaborated by Kirchherr et al (2017), which clearly maps the systemic perspective of CE:

"CE describes an economic system based on business models that replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production, distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations."

This definition ties up four major challenges being addressed by CE - waste management, environmental impact, increase of economic benefits and development of social welfare - thus reflecting on the interdependence between sustainability and economics. We chose this definition because combining sustainability and economics illustrates the transformation towards CE as an iterative and highly complex process in which many distinct variables have to be considered. Some of the most common variables studied in the CE literature are: the definition of rules and norms, the cooperation of actors, the development of appropriate business models, relevant innovation, sustainable design, education and identification of barriers and opportunities (Ritzén and Sandström, 2017). In summary, for CE to properly function, simultaneous adoption by actors across the market is needed (van Buren et al., 2016). As put by van Buren et al (2016), a transition towards CE requires simultaneous changes in various subsystems (e.g. economic, financial, logistic), clear guidance and an appropriate set of monitoring and control systems. *Figure 3* shows the 'Circular economic Loop', which displays different stages of possible CE application through the product life-cycle.

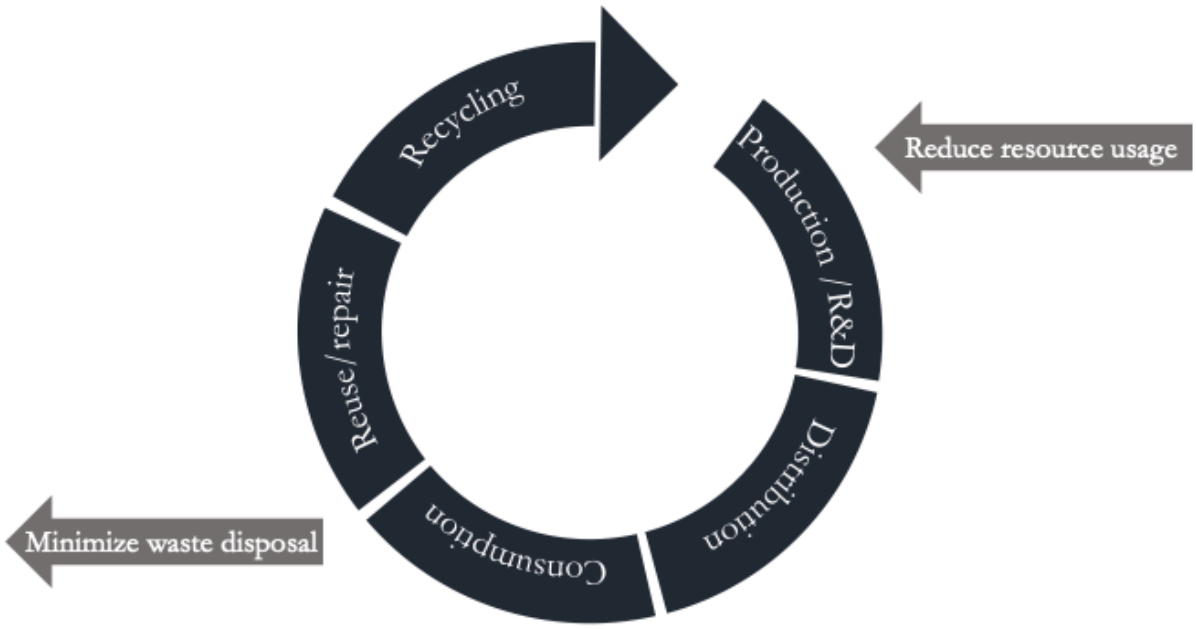


Figure 3: The Circular Economic Loop and its most common stages

2.1.1 From waste management to resource management

During the past decades, the hegemony of the linear logic has positioned waste management as a major component of the economic system. As mentioned, in the linear paradigm used products are disposed of as waste. Thus, the appropriate operationalization of all activities partaking in the disposal process becomes the main objective of waste management. However, several limitations of such a conceptualization are illustrated in the definition of 'Waste Management'. Although many definitions could be devised according to the focus of the perspective adopted (Pongrácz and Pohjola, 2003), we will take the one coined by the United Nations (1997), which states that:

"*Waste management involves the prevention of waste production, the collection, transportation, treatment and disposal of waste and the control, monitoring and regulation of those activities".*

There are two issues with this traditional conceptualization of waste management when considering the CE logic. Firstly, it carries the underlying assumption that waste has negative economic and cultural value (Hawkins and Muecke, 2002; Stahel, 2010; Stahel, 2013). Secondly, it simplifies waste management to a series of isolated activities, therefore losing focus on the aggregate effect of these activities (Davis and Hall, 2006; Zhijun and Nailing, 2007). Consequently, to appropriately build on the CE logic the resource management concept seems more appropriate because it considers waste as a resource with positive economic and cultural value and it adopts a system perspective (IRP, 2017).

Changing the value perspective of waste allows for the creation of resource circularity. CE emerges because what once was disposed of due to its negative or zero value, now is reintroduced in the system as a resource with incremental value (Hawkins and Muecke, 2002; Stahel, 2010; Stahel, 2013). Consequently, this creates closed resource loops and a production system that is less dependent on virgin natural resources (Kalmykova et al., 2018; Reike et al., 2018; Stahel, 2013; Yuan et al., 2006). Following this logic, some scholars also argue that the concept of 'added value' in linear economies is replaced by that of 'value maintained' in CE, meaning that value should reflect the ability of the resources to be transformed and re-transformed in order to preserve the quality of the materials and the technical value in the goods (Iacovidou et al., 2017; Stahel, 2013). This new perspective on the value of waste has huge practical implications since the preservation of the technical value of resources becomes a necessary means to create social well-being and economic development (Iacovidou et al., 2017).

The second contribution enabled by the new conceptualization of resource management is the movement from a narrow view of isolated processes inside waste management, to a system approach in CE (IRP, 2018; Vidal et al., 2013;). Scholars and practitioners explain that this change in scope is required in order to devise solutions that do not pass the problem from one specific part of the value chain to another (Allenby and Richards, 1994). They argue that the absence of systemic perspectives could lead to unexpected externalities and higher costs in other levels of the value chain. As Vidal et al (2013) explains, it is important "*to take a system-approach that prevents displacement from one issue to another (...) since, for example, the move away from fossil-fuel can cause new issues due to depleting natural reserves of metals needed for low-carbon infrastructures*". Moreover, a system approach considers the entire product life-cycle and therefore allows for integrative solutions. For instance,

a recent report on CE describes how waste could be reduced and resource efficiency maximized if the design of the product facilitated reuse or recycling (MacArthur, 2018).

Furthermore, this new conceptualization of resource management also allows for the introduction of the concept of *leakage*, which means that resources that leave the loop are perceived as losses for the economic system. This is an important concept because for the economy to be circular, focus must be directed towards reducing leakages throughout the value chain (MacArthur, 2013). From a practical point of view, this involves engaging in activities such as selecting the right materials in the product development phase, improving accuracy in the sorting and separation of materials prior to recycling, and designing products suitable for reuse and recycling. The Ellen MacArthur Foundation (2018) studied the leakage phenomenon for plastic package materials and found that 86% of post-use plastic package materials globally are either burnt, placed in landfills or littered in the environment (See *Figure 4*). It becomes apparent that the circularity cannot be achieved unless used resources are reintroduced to the system. Therefore, resource management as opposed to waste management, becomes essential since it allows for strategies that help reduce leakages and close the resource loop.

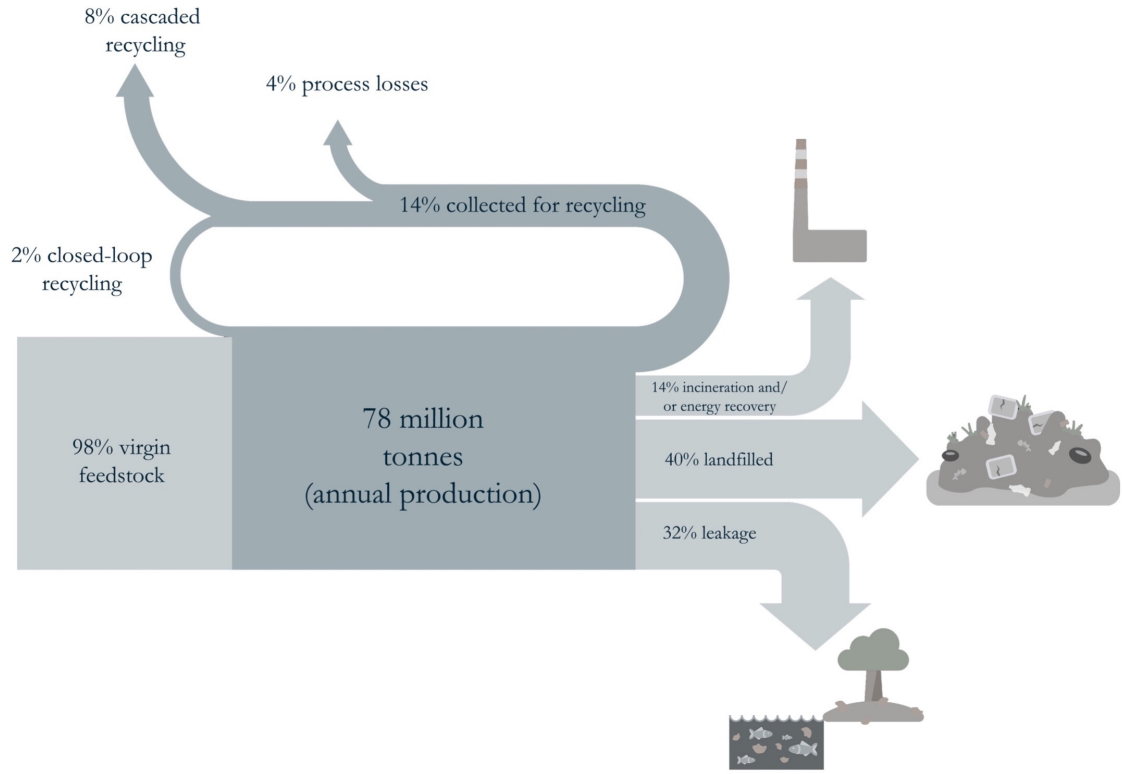


Figure 4: Plastic Packaging Material Flows are largely linear (Ellen MacArthur Foundation, 2018).

Among the extensive literature on CE there are various studies covering the effects of CE on markets and market change, however, most of them often focus on specific dimensions of markets or specific market practices. For instance, some scholars have studied the influence of CE on business model strategies (Bocken et al., 2016; Linder and Williander, 2017; Velenturf and Jopson, 2018) while others have focused on product design for CE (Bocken et al., 2016; Romero-Hernández and Romero, 2018). Other studies explore the advancement of CE from a focal firm perspective and identify favored practices and perceived barriers in the sector (Masi et al., 2018; Romero-Hernández and Romero, 2018). Furthermore, Stahel (2013) elaborates on how policy can

influence the creation of CE in markets arguing that sustainable taxation could foster resource efficiency. Other studies have focused solely on developing methods of measurement for assessing the effects of CE on business profitability, society and the environment (Linder et al., 2017). Geng and Doberstein (2008) and Zhijun and Nailing (2007) also studied the implementation of CE in China and highlight barriers and drivers to the 'leapfrog development' of CE in that specific market. Finally, scholars have provided different explanations on how a change in value perception could be achieved. Some define sustainable taxation as the key lever for change (Stahel, 2010), others claim that incentives and sanctions through policies such as extended producer responsibility (EPR) and 'polluter pays principle' are more suitable (Lindhqvist, 1992). Others focus on more technical perspectives designing valuation frameworks for sustainable systems of production and consumption (Iacovidou et al., 2017).

2.2 Practices that enable CE

2.2.1 The Resource Hierarchy

For a long time, practitioners and scholars have made use of a hierarchy framework to rank options of practices in order to prevent waste generation and keep materials in the CE loop (Taelman et al., 2018). Such a framework has been known as 'waste hierarchy' (Kirchherr, 2017), but to align it with the CE logic we redefined this framework as 'Resource hierarchy'. The resource hierarchy defines (1) prevention and (2) reduction as the preferred options followed by (3) reuse and (4) recycling. These methods help closing the loop with minimum waste leakages, while also reducing the amount of raw material extracted from nature. At the lowest level of the inverted pyramid are (5) recovery of energy (e.g. incineration) and (6) disposal in landfills. Neither of these latter options are considered as appropriate solutions under the CE logic since they not only oppose the principle of maintaining resources in the economic loop, but also potentially harm the environment and human health (EC, 2018). For this reason, recovery of energy and landfilling are considered to be transitory alternatives towards CE. To illustrate the order of preference of these different resource management options an inverted pyramid is used (*Figure 5*).

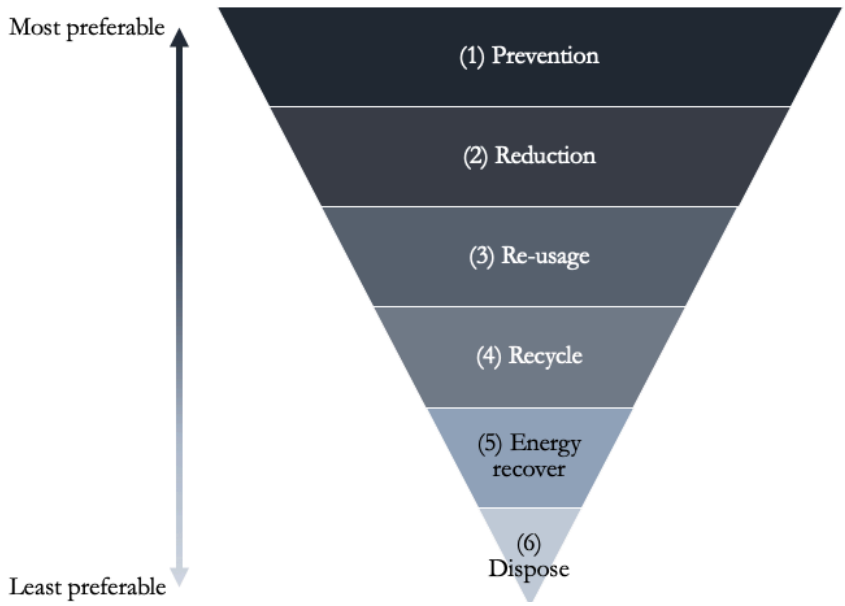


Figure 5: Resource hierarchy

2.2.2 The role of Policy

Successful transitions towards CE have often been dependent on policies (Taelman et al., 2018). One of the most commonly applied policies to foster the development of CE is the extended producer responsibility (EPR) law (Lindhqvist, 2000) that has been influential in the gradual shift from the disposal of waste to the material and energy recovery (OECD, 2017).

EPR policies force producers to internalize costs from externalities related to their activities by retaining the ownership of the manufactured goods throughout the entire product life-cycle (Lindhqvist, 2000; Stahel, 2013, EC, 2018). In this way, producers are held physically, legally and financially responsible for the waste management of their products and forced to engage in activities that help minimize leakages in the economic loop, such as collection of used packaging or eco-design of products for better recyclability. Moreover, these types of policies partially relieve the financial burden of waste management traditionally assigned to municipalities (EC, 2018).

As defined by Thomas Lindhqvist (1992), EPR *"is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product. The extended producer responsibility is implemented through administrative, economic and informative instruments."*

By combining physical and financial responsibility, EPR policies mitigate the risk that manufacturers oversee the cost of environmental externalities when designing their products. In other words, by giving control to the manufacturers, it gives incentives for cost optimization, resource efficiency and product improvements, which will eventually result in positive environmental effects (Lindhqvist, 2000). A good EPR policy is one that generates incentives to align the interest of producers with sustainable development.

An example of a widely applied and successful instrument inspired by this policy is that of the deposit refund schemes. Particularly applied for PET bottles, glass bottles and aluminum cans, this solution implies that the customer pays a deposit fee on the purchased product, and later receives a refund when the used container is returned. Such initiatives seem to be successful as collection rates above 80% have been achieved in most deposit schemes launched throughout the world. (Reloop, 2018)

2.3 The waste management system in GBA

Despite having the 8th biggest national territory in the world, Argentina has a population of only 40.1 million citizens (INDEC, 2010). A major part of its population is concentrated in the metropolitan region called Gran Buenos Aires (GBA), or 'Big Buenos Aires'. GBA integrates both the Ciudad Autónoma de Buenos Aires (CABA), or 'Autonomous city of Buenos Aires' and its suburbs composed of 24 municipalities belonging to the Buenos Aires Province (BA). While GBA's surface accounts for 1.4% of the Argentinian territory, almost 33% of the country's citizens live in the region (INDEC, 2010). Consequently, we will focus our study in GBA, due to its

substantial relevance in the country. *Figure 6* shows a geographical overview of Argentina and of the GBA metropolitan region composed of the 24 municipalities and CABA.

Figure 6: A geographical overview of Argentina and GBA

Waste management in Argentina is regulated by the National Law 25.916 (2004), which defines minimum quality standards and provides a framework for the operationalization of waste management activities. Although the application of this law is compulsory throughout the country, governments from the provinces can mandate additional legislation to for instance determine strategies and procedures to comply with the national law. The provinces rely on public bodies that are in charge of defining policies, suggesting laws and norms, controlling for the compliance with the legislation and promoting social development in the region.

Municipalities are autonomously responsible for the design and execution of waste management. They have the specific function of standardizing and controlling activities related to environmental sanitation in their territory and they are also responsible for cleaning and closing open dumps and providing waste management services. Municipalities also have the legal authority to associate with nearby municipalities to handle the final disposal of the waste (Law 25.916, 2004). Although stipulated by the law, the collection is seldom differentiated and therefore all types of waste are mixed in common disposal devices (e.g. garbage bins) (CEAMSE, 2018; ONGIRSU, 2018). The absence of separation at origin brings several complexities to later stages of the waste management process since the revalorization of resources depends entirely on the quality of the collected materials.

During the past two decades, GBA has failed to reduce both the amount of waste generated and the usage of landfills (Fundación Metropolitana and CEAMSE, 2017). Additionally, although BA province does not have a legislation to support these changes in the suburbs, CABA launched its

own Zero Waste Law in 2005 that stipulates that both collection and disposal of waste should be done separately (Law 1854, 2005). However, that is not a common practice today neither in CABA nor in BA province and consequently, of the 17.000 tons of waste disposed of daily in GBA, over 88% is landfilled (Fundación Metropolitana, 2018).

2.3.1 Recycling practices for PET Bottles

Plastic is a global phenomenon with a myriad of applications disseminated around the world. In Argentina, 46% of plastics consumed are related to packaging of which 22% are PET plastic (CAIP, 2016). However, recycling practices in the region are not widely established. Most of the recyclable waste (plastics, glass, paper and cardboard) in GBA is collected by informal workers (CEAMSE, 2018). These workers are called 'Cartoneros' and emerged as a consequence to the economic crisis that struck the nation in 2001. Unemployed workers saw an opportunity in the underexploited recycling business and started to make a living out of collecting recyclables from public garbage bins and selling them to recycling companies. Since most recyclables in GBA are collected through Cartoneros and official statistics do not take these figures into consideration, it is difficult to quantify the real recycling levels. Additionally, CABA installed over 200 collection points ('Green points') for household recyclable material in parks and important public locations (CABA, 2017). Furthermore, the metropolitan area of GBA has a few separation plants that receive mixed waste and separate it for further recycling. However, the complexity of handling and categorizing mixed materials and the high costs entailed only allows for low levels of recycling in the region (CEAMSE, 2018). Official data shows that barely 987 tons of recyclables were collected during 2016, of which PET accounted for almost 20 tons (CABA, 2017).

Currently, Argentina has no packaging law requiring producers to internalize the cost of waste or contemplating a producer responsibility policy (CEAMSE, 2018). The handling of PET packages, therefore, is not differentiated by law from the handling of other recyclable waste.

2.3.2 The waste management company: CEAMSE

"Coordinación Ecológica Área Metropolitana Sociedad del Estado" (CEAMSE) in English, 'Ecological Coordination of the Metropolitan Area' is a publicly owned company in charge of the final disposal of waste. It was jointly created by BA and CABA in 1977 with the objective of executing an appropriate treatment and final disposal of waste in GBA (CEAMSE, 2018). Nowadays, CEAMSE manages different "Environmental districts" where landfills are developed and most of the waste from GBA is disposed of (CEAMSE, 2018). Additionally, they operate a separation plant called Mechanical-Biological Treatment (MBT) that processes about 1100 tons of waste per day (7% of the daily collected waste) of which around 40% is composted and 20% is recycled (CEAMSE, 2018; Fundación Metropolitana and CEAMSE, 2017). *Figure 7* provides an overview of the waste management configuration in Argentina and the three levels of responsibility that characterize it.

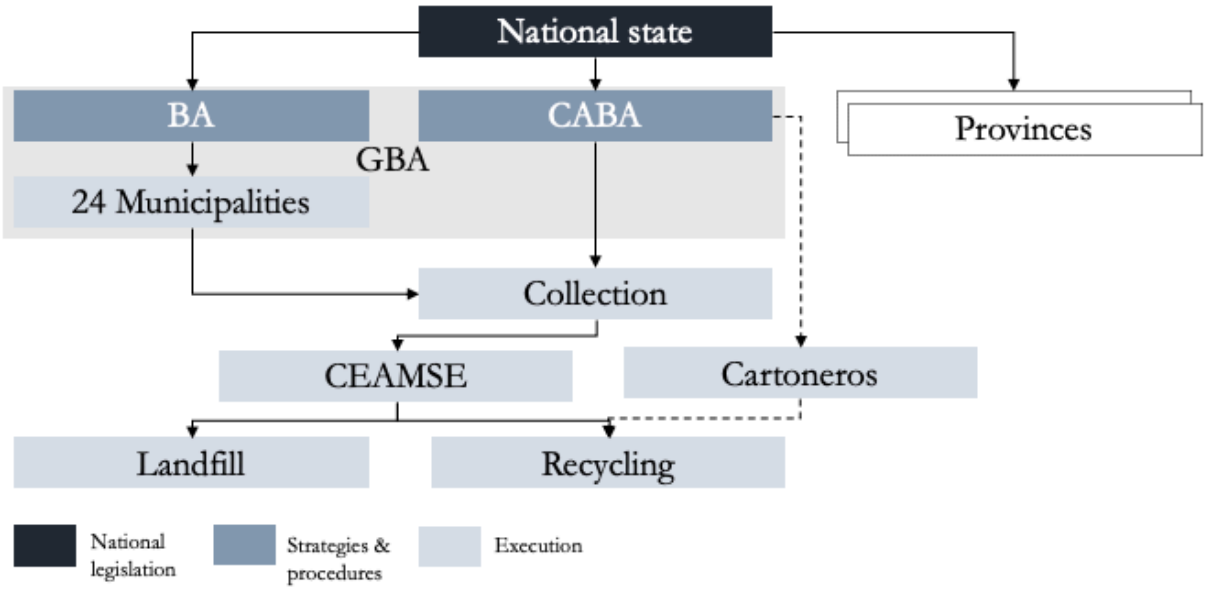


Figure 7: Overview of the current waste management *configuration*

2.4 Concluding remarks

In the previous section we reviewed the extant literature on CE, which has both used the notion of CE to define a new economic system as well as to describe the practices that lead to its creation. Following, we further reviewed the waste management organization in Argentina.

We argue that in order to understand the transformation from a linear to a circular economy in GBA, the focus should be directed to the practices that CE encompasses thus enabling us to study such transformation as a process in which practices shape markets. Therefore, in order to better understand how CE is shaping the PET packaging recycling market, it is necessary to use a theoretical framework that can shed light on different market practices. In the next section, we introduce (3.0) the theoretical framework and which will be the base to discuss our empirical findings.

3 Theoretical framework

During the last decade, scholars have highlighted the need for marketing theory to put more emphasis on markets (Lusch and Vargo, 2006; Peñaloza and Venkatesh, 2006; Waluszewski et al., 2004). A changed perspective on marketing and a movement from the traditional '*4P model*' and an abstract conceptualization of markets, to a field of marketing that places markets at the heart of market theory and has a practical understanding of the market construct (Kjellberg et al., 2012; Waluszewski et al., 2004). Callon (1998) claims that the '*homo economicus'* concept is inadequate to describe market behavior and rejects the notion that markets are spontaneous creations. Instead, he directs particular attention to the study of practices that make '*homo economicus'* a reality, introducing the idea that markets are constructed through a range of practices (Araujo, 2007; Araujo et al., 2008). Building on this stream of thought, and combining actor-network theory (Callon, 1998) with practice theory (Reckwitz, 2002) a new approach on marketing theory called market-as-practice arose.

3.1 Markets as practice

Markets-as-practice literature addresses the question of how markets are shaped by studying the practices that constitute markets (Kjellberg and Helgesson 2007). Scholars from this school of thought, refer to markets as sites of multiple sets of practices, therefore directing attention to the forms markets take as a result of efforts to shape them (Araujo et al., 2008). Taking Reckwitz (2002) concept of practice as 'a routinized type of behavior which consists of several elements, interconnected to one another', practices are understood as embedded in a context of interlinked subjective and objective elements (Storbacka and Nenonen 2011). Moreover, this practice-based approach allowed scholars to move from a representational to a performative way of theorizing (Araujo et al., 2008), meaning that markets are no longer considered abstract entities whose typologies can be accurately represented, but on the contrary, attention is directed to the *'emergent and unfolding practices that actors engage in to construct and problematize markets'* (Araujo et al., 2008). As suggested by Kjellberg and Helgesson (2006), *'this allows us to move away from polarised discussions about how certain theories provide unrealistic characterizations of markets* (e.g. in academic discussions) *or how certain markets are not real markets* (e.g. in regulatory settings)'.

The market-as-practice literature uses a heuristic framework to study how markets are shaped by practices. This framework devises three distinct and interlinked types of market practices: normalizing, representational and exchange practices (Kjellberg and Helgesson, 2007). Such practices are not isolated but rather interlinked through chains of translations. A *translation* is defined as the basic social process through which something - an idea, a process or a concept - spreads across time and space (Latour, 1984). Relevant to the concept of translation is the fact that 'things' being transported are usually transformed throughout the process and that interrelations among different practices are not given but depend on how markets are discursively and materially organized (Kjellberg and Olson, 2017). Kjellberg and Helgesson (2007) argue that the study of market practices and how these are interlinked allows for a systematic understanding of the process that produces working markets and enables the empirical study of how markets are shaped.

Essential to this approach is also the notion that entities in the market are a result of practical associations. For instance, exchange practices result in the constitution of buyers, sellers and product (Kjellberg and Helgesson, 2006). Therefore, this conceptualization of market practice understands actors as a result of interlinked practices and characterizes them as networks of variable geometry, meaning that their configuration could vary in different settings (Latour, 1987, 1996). This actor-network configuration is created through a process of inter-definition (Latour, 1996), which means that the practical interaction of actors is also a central aspect of the process. Following this section, we will expand and illustrate the threefold of market practices.

3.1.1 Normalizing practices

To emphasize the compliance with formalized and informalized behavioral frames, actors engage in normalizing practices (Kjellberg and Helgesson 2006; 2007). Normalizing practices include activities such as the establishment of guidelines, standards and regulation intended to create stability and consistency. To exemplify, the introduction of laws concerning EPR in some countries defined rules and helped establish stable institutions that promote CE practices.

3.1.2 Representational practices

The markets-as-practice perspective advocates that the economic exchange processes are re-presented as markets through representational practices. Scholars define representational practices as practices that solely describe markets and their way of working (Kjellberg and Helgesson, 2006; 2007). Representational practices are often portrayed by the market analysis that provides a depiction of what is currently out there. For instance, the statistical analysis done by waste management agencies makes representations and descriptions of exchanges and practical events. As well as normalizing practices, representational practices also have elements of governance in stipulating goals for achievement.

3.1.3 Exchange practices

While normative and representational practices involve practices framing and describing the exchange. Exchange practices involve practices that are essential for the exchanges of physical goods and services, and all activities needed to facilitate the exchange (Kjellberg and Helgesson 2006; 2007). These range from value chain activities to product development and advertising campaigns. In the case of markets with recycling systems in place, exchange practices refer to for instance consumers separating the waste and recycling companies' treatment of the materials.

3.2 Translations

While it is relevant to acknowledge the importance of each practice influence on the market as stand-alone entities, it is essential to cover the circumstances in which they interact. Markets are extensively subject to whispering games, where the transportation of messages often are subject to transformation (Kjellberg and Helgesson 2007). Actors make statements that other actors collect, interpret, and if successfully negotiated implement activities in accordance with. Latour (1984) describes this process as a process of translation, whereby negotiation between market actors in a

network can result either in stabilized agreements with reduced need for further negotiations, or on the contrary, in irregularity and uncertainty.

The concept of translation in the markets-as-practice approach characterizes the interrelation of various market practices (Kjellberg H. and Helgesson, 2006). Therefore, the three foundational practices in this model are interlinked with each other through chains of translations that produce the market (Kjellberg and Helgesson, 2007). Normalizing practices define the *rules and tools* for exchange practices. An illustration of this inside the CE field is the EPR policies that create rules that become translated into tools. Such tools affect exchange practices in the market, for instance by favoring the creation of deposit schemes and the development of more recyclable bottles. In parallel to this process, the authors argue that *interests* from participants involved in the exchange may influence normalizing practices as well (Kjellberg and Helgesson, 2007). For example, in many developing countries where high levels of informal labor are found, legislators take the informal market exchange practices into consideration, by stipulating rules and regulations that enforce the operational rights of the informal sector. Normalizing practices also define *measures* (defines what to measure) and *methods of measurement*, which define how representational practices engage in a *description* of the emergent translating exchanges into *measurements* of the market. For instance, EU regulation on CE (normalizing practice) stipulates a specific target for the rate of collection and recycling for beverage package containers. These targets are measured by environmental protection agencies through systematic monitoring (representational practice) of the recycling activities in the market (exchange practice). Simultaneously representational practices affect the exchange practices, as the outcome of the continuous monitoring generates *results* and re-presentations of the market that the exchange practices will take into consideration (e.g. adjusting the budget if results are below the target). Representational practices also interlink with normalizing practices by providing *descriptions* as market data or observation depictions, which may translate into alterations of the norm (e.g. if a target was achieved, an adjustment to new higher target levels could take place).

3.3 Performativity

Given the practice-based approach of this theoretical perspective, the concept of *performativity* becomes an essential element since it allows to explain how the world of ideas takes part in shaping reality (Kjellberg and Helgesson 2006). According to this perspective market practices involve all activities that contribute to constitute markets, including market theorization and ideas about the market (Kjellberg and Helgesson 2006). Therefore, the concept of performativity will enable us to analyze how ideas about CE influence practices that constitute markets. Although the world of ideas and the world out there (i.e. reality) are both understood as practices under this theoretical lens, it does not mean that all practices are equal, in fact, practices are considered to be heterogeneous because they are made different depending on how they are interlinked and arranged (Kjellberg and Helgesson 2006). In other words, both the world of ideas and the world out there, are outcomes of practices that construct them as the imaginary end-points in a chain of practical translations, each containing ideas while being part of the world (Kjellberg and Helgesson 2006). The movement from the world of ideas to the world out there is conceptualized as *performing* the world while the opposite movement is conceptualized as *re-presenting* the world.

The literature describes two major types of performativity, namely *Austian Performativity* and *Generic Performativity*. The former refers to situations where there is a strong and exclusive relation between the world of ideas (theories, social categories, etc.) and a resulting reality (MacKenzie 2004). A clear example of this could be speech acts, ideas that change reality just by being pronounced in the correct setting (Austin, 1962). For instance, the act of forgiving someone, which is done as it is being said: "I forgive you". According to Kjellberg and Helgesson (2006), Austian performativity could be understood as an 'ideal-type' as it is empirically uncommon to find situations where one theory or idea has shaped all practices in the market (norms, representations and exchanges). The later type, Generic Performativity, denotes a wide variety of cases where an idea in some non-exclusive way shapes reality (MacKenzie 2004). An example of this would be the design of an eco-friendly packaging as inspired by specific models of eco-design, but possibly also affected simultaneously by other ideas, such as models of customer preference.

Building on *Austian performativity* Kjellberg and Helgesson (2006) introduce the *strong but partial performativity* concept. These are situations where a theory generates a strong and exclusive link only with one specific set of market practices (e.g. exchange practices) therefore leading to cases of generic performativity. They further suggest that this situation results in temporarily stabilized relations between such theory and the particular set of practices shaped, as well as in considerable tension with the other sets of practices that are not shaped. To provide an illustration of this phenomenon, a theory that shapes only exchange practices in a market could possibly result in both lack of legitimacy and difficulties to evaluate performance. It could result in the former since the exchange practices are not aligned with the current norms and in the latter since the exchange practices are not reflected in market representations (Kjellberg and Helgesson, 2006).

This leads us to introduce the concept of *controversies*. These situations are conceptualized as the outcomes of some form of controversy where different sets of market practices are at odds and therefore competing with each other to shape reality. Although this suggests that inconsistencies among different sets of practices result in conflicts, depending on how such controversies play out, the outcome of these competitions might very well result in functioning markets (Kjellberg and Helgesson, 2006). For example, when a retail store decides to unify criteria by introducing a common measurement technique (e.g. price per liters/kilogram) after acknowledging the complexity customers face when comparing prices due to the different sizes and packagings of products.

3.3.1 Multiplicity

The markets-as-practice perspective builds on the concept of '*multiplicity'* to highlight that tensions and *controversies*, arise as a consequence of multiple and sometimes incompatible practices. Market practices are characterized by multiplicity for three main reasons. First, because individual market actors might engage in diverging market practices simultaneously. Second, because market practices might bring together different market actors with diverging definitions of the market. Third, because there are many different market actors performing different market practices and thus shaping the market simultaneously. Therefore, multiplicity renders the existence of a single market

difficult and it rather suggests the idea that '*reality is different things, and that different versions of the same objects are enacted through different practices*' (Kjellberg and Helgesson, 2006).

Furthermore, market practice inconsistencies could result in controversies and in co-existence through practical management of incompatibility. There are two general methods to manage this, first, to avoid conflicts by separating incompatible practices in time and space, and second, to coordinate conflicting practices when they encounter each other (Kjellberg and Helgesson, 2006). The later, could involve various techniques such as *adding* various version of reality that have relevant aspects in common, *privileging* one version of reality above the other one, *calibrating or translating* some version of reality to make it compatible with another one, *negotiating to achieve alignment* and *suppressing* or postponing the resolution of incompatibility to some other situation.

3.4 Theoretical synthetization

In summary, the markets-as-practice perspective studies markets in the making, a practical process that results from the translations between different interlinked practices. In such a process, multiple theories about the market perform practices and the actors that enact them (Araujo et al., 2008; Kjellberg and Helgesson 2007; Storbacka and Nenonen 2011). By stressing the performativity effects of the field of CE on the three types of interlinked practices, the theory facilitates a practical framework to understand the transformation of CE in the PET market in GBA.

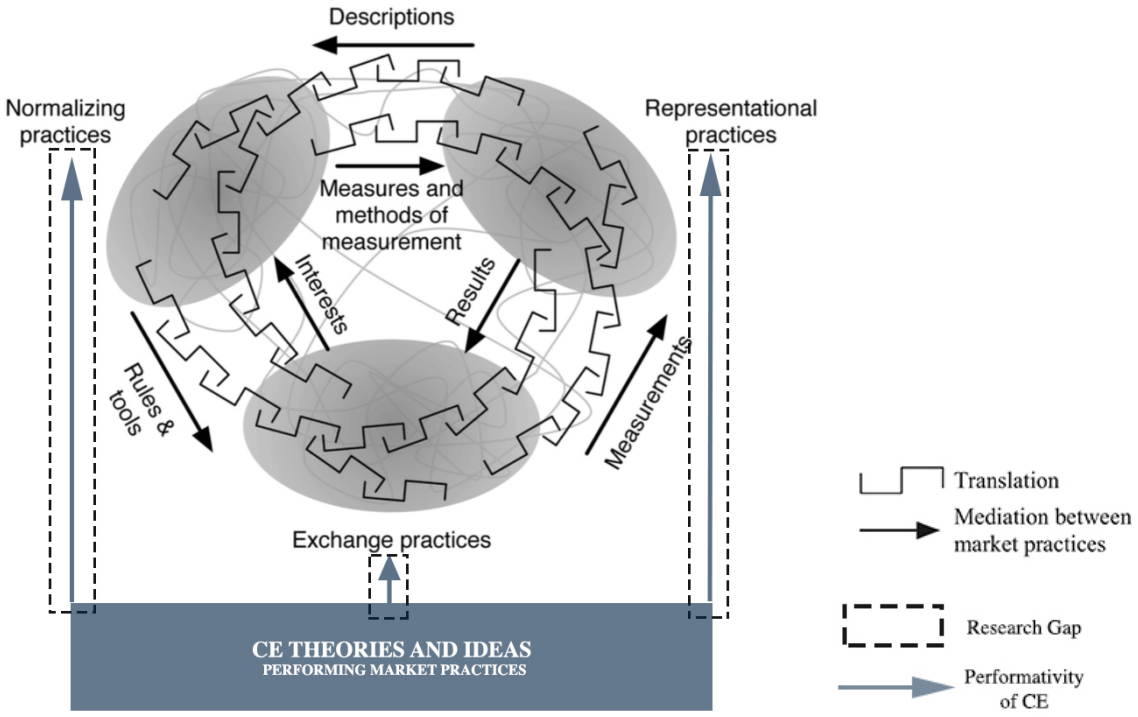


Figure 8: Visual representation of the theoretical framework and the research gap (Adapted from Kjellberg and Helgesson, 2007).

As illustrated in *figure 8*, our empirical analysis will focus on the effects of CE on market practices and provide further understanding of the multiplicity of practices that are simultaneously shaping the market configuration. Therefore, the main research question, *how is Circular Economy transforming*

the Waste Management practices of the market for PET Bottles in GBA, could be further broken down into the following questions:

RQ 1.1: *How Circular Economy performs the practices that shape the market for PET Bottles?*

RQ 1.2: *How does Multiplicity affect how Circular Economy performs the market for PET Bottles?*

4 Methodology:

In the following section, we will (4.1) introduce the methodological fit, (4.2) describe the design of the study, (4.3) the data analysis process and lastly (4.4) clarify how we ensure the quality of our study.

4.1 Methodological fit

The question of how CE influences waste management practices in the market of PET Bottles in GBA requires cultural submersion and actor insights to be properly answered. In order to fulfill such purpose, a qualitative approach seemed most suitable for three main reasons. First, the markets-as-practice perspective stresses the importance of studying translations among market practices performed by actors. A qualitative research design both, enabled us to create knowledge through interpretations of actors' insights, descriptions and analyzes, and allowed us to describe the reality by understanding interactions between market actors (Bell and Bryman, 2015). Second, we addressed a nascent field of research, which was suitable to address with data collection that enabled interpretation of the answers given (Edmondson and McManus 2007). Finally, describing a distant phenomenon from an artificial setting like a quantitative survey would have created evident uncertainties regarding sampling and reliability. Rather we needed to investigate the natural setting of the scenery to capture the necessary contextual data (Bell and Bryman, 2015, Fossey et al., 2002).

In line with market-as-practice scholars (Kjellberg and Helgesson, 2007), we adopted a social constructivist ontology. We considered reality as composed by social actors and shaped through their interrelations and interactions, and thus in a process of constant change (Bell and Bryman, 2015). Epistemologically, we applied an interpretivist perspective as we studied actions by viewing reality from the market actors' point of view (Bell and Bryman, 2015). Our research displays both an empirical and an academic gap. To handle this, we applied an abductive approach and worked with literature and empirics simultaneously for two main reasons. First, the approach was suitable for qualitative research (Alvesson and Sköldberg, 2009). Second, the gap was of empirical and theoretical interest while nascent in its nature, thus an abductive approach enabled an iterative knowledge creation process between theory and empiric (Dubois and Gadde, 2002). Practically, we applied the methodology introduced by Gioia et al (2013) that moves from an empirical focused "first-order" categorization to a "second-order" phase where the iterative knowledge generation takes place.

4.2 Design of study

From the beginning, we were highly interested in Emerging markets and sustainable development. Following an iterative learning process, the scope was narrowed down and focus crystalized. The study was limited to one geographical market, which reduces the opportunity to generalize from the findings outside the pre-defined context (Bell and Bryman, 2015). The sole focus was to capture the uniqueness's in GBA to help the reader understand how CE affects market practices. We

applied a societal perspective for the level of analysis. Meaning that we tried to depict the configuration of market practices by talking to many different influential stakeholders in their natural environment.

Yin (2013) argues that case studies are suitable tools when the researcher tries to explain the emergence of contemporary events in their context. Contextual conditions are essential for waste management practices, as specific market configurations depend on the interrelation of its market practices, rendering each market unique. Moreover, CE in Emerging Markets is a nascent phenomenon that is gaining attention from legislators and practitioners. Legislators in many developed economies have implemented different efforts to enable the 'waste to resource' transition, for example through EPR initiatives discussed previously. Latin America is the region in the world with the lowest recycling rates and with the highest combined landfilling and waste dumping rates (World Bank, 2018). This creates an environment where CE initiatives can have a substantial impact on market practices, thus making it an interesting region to study. Moreover, practical reasons also enabled us to further narrow the scope of the research to GBA. One of us is a native, knows the local language, has established connections and knows how to navigate the local culture.

The data collection was performed in Argentina (6/10-14/10, 2018), Norway (27-29/9, 2018) and Sweden (25/9-16/11, 2018) and consisted mainly of interviews and visits to the field. To gain more insights on CE, we visited Returpack's sorting facility in Norrköping, Sweden and the development facility for TOMRAs reverse vending machines in Asker, Norway. TOMRA is an important actor for the technology of collecting solutions for PET Bottles, with a global market share above 70% for reverse vending machines (TOMRA, 2018). To further enrich the Argentinian context of the interviews, we visited the major waste management facility Norte 3 in BA operated by CEAMSE. We observed the landfill operations, the process handling water leakage and the MBT recycling facility. While in Argentina, we spent time observing Cartoneros - waste collectors - collecting garbage on the street, visited one collection point for PET Bottles and participated in a conference about CE arranged by the UN.

4.2.1 Semi-structured interviews

Rubin and Rubin (2011) introduce the principle of responsive interviewing and describe the process as "*obtaining interviewees interpretations and understanding of the world in which they live and work*". This is applicable to semi-structured interviews with open-ended questions as a base and follow-up questions stemming from them. Semi-structured interviews enabled us to ask follow-up questions outside the frame of the questionnaire, to increase the flow of the conversations and discover unknown unknowns. In addition, it allowed us to understand which factors are of the highest importance for the interviewee (Bell and Bryman, 2015). This shaped many of the conversations and the nature of the topic often resulted in discussions concerning controversial issues. Since we searched for individual subjective evaluations of the practice developments, we found semi-structured interviews to be the most applicable tool.

4.2.2 Sampling

To collect adequate data for the designated purpose we decided to use a qualitative sampling. Qualitative sampling concerns identifying the actors that "best inform the study" and selecting the right non-human sources (Fossey et al., 2002). We followed this advice and applied a purposeful sampling process where the knowledge generated from the Nordic configuration guided us towards certain types of market actors and sources of secondary data. The diverse nature of those configurations involved many different actors, which made the purposeful sampling process broad in the sense that stakeholders of very different nature were contacted. In addition to that, we used some snowballing as we identified a couple of actors that guided us to contact other actors. Potential interviewees were contacted via email or phone and meetings were arranged in advance.

4.2.3 Interviews

In total, we conducted 30 interviews of which 18 were conducted with actors from Argentina. The interviewees represented the retail sector, beverage producers, trade associations, waste management technology providers, waste management companies, NGOs, researchers, universities, cooperatives and government officials. Interviews lasted 30-120 minutes and were either done face-to-face, over Skype or via phone. 21 interviews were conducted in English and eight in Spanish. English was the preferred language, but due to language barriers and convenience, we made some exceptions to this. To be able to leverage our diverse perspectives and create a more dynamic conversation, we were both participating in all interviews except for two of them that were held by one of us. See complete interview overview in *Appendix 10.1*.

To suit each interviewee and to increase the relevance of each conversation, the standard questionnaire underwent some adaptations. In some cases, questionnaires were sent to respondents as they required to see the main questions prior to the interview. We had the privilege to interview highly influential people. To ensure trust and sincere answers and to signal professionalism, we prepared before each interview so we would be knowledgeable about them and their organization (Odendahl and Shaw, 2002). See standard questionnaire in *Appendix 10.4*.

Each interview started with a small talk, often lasting a couple of minutes. This helped us to establish rapport with the interviewee and a basic foundation of trust, trying to make the interview feel like a conversation (Rubin and Rubin, 2011). This followed a question asking for allowance to record the conversation and an introduction to the topic of research. The interview began with an introduction of the interviewee followed by some systematic warm-up questions to help the interviewee adapt to the format. Consequently, we went through the core parts of the questionnaire and finished up with wrap up questions concerning topics that we missed out and allowance to ask follow-up-questions if those were to arise.

4.3 Data analysis

With a semi-structured data collection followed semi-structured output. This implied the need to carefully and consistently handle the gathered information in order to draw reliable conclusions, which was a highly time-consuming activity (Bell and Bryman, 2015). All interviews were transcribed with great caution in order to ensure all information was captured properly. Furthermore, interviews conducted in other languages but English were first transcribed in the local language and then translated manually to ensure that the message from the respondent was fully captured.

The concept of grounded theory helps researchers develop theory from systematically collected data (Strauss and Corbin, 1994). Our data complied with that and consequently we adopted the three-step analysis ladder from Gioia et al (2013). Building on the concept of open coding where researchers conceptualize the data (Strauss and Corbin, 1994), we labeled the data after terms used by the respondents (Gioia et al., 2013). We marked quotes with different comments in the transcribed material. All these quotes were pasted into a new document where we funneled the list of first order codes or concepts, from beyond 50 to 17. At this point, Gioia et al (2013) suggest researchers to reflect and to explain the situation theoretically. Strauss and Corbin (1994) put some further light on this, recommending researchers to include "inductive and deductive thinking". We followed this suggestion and identified some constructs aligned with the markets-as-practice and multiplicity theories while searching for nascent concepts that could help us shed light on the transformation that we were observing. This resulted in eight second-order constructs. From this, we condensed the material even further and formed the three aggregate dimensions 'practices that shape the market', 'market controversies' and 'urban collectors'. See partial extraction of the methodological approach in *figure 9* and complete overview in *Appendix 10.3*. Once completed, we matched the transcriptions with the first order coding's to visualize the level of cohesiveness of each concept, see *Appendix 10.2*.

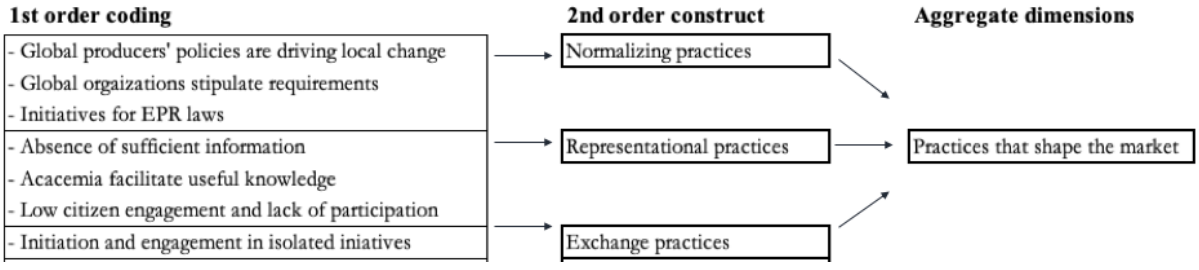


Figure 9: Partial extraction of the methodological approach

4.4 Quality of the study

To ensure the quality of our research and trustworthy findings, we used several methodological tools. We followed the process as described by Lincoln and Guba (1985) to ensure validity and reliability, factors that in the context of qualitative research are translated to credibility, transferability and dependability. Given our constructivist stance, we followed the advice of Flick (2009) and leave out the concept of objectivity.

4.4.1 Credibility

Credibility mirrors internal validity and measures the degree to which findings are aligned with reality and are hence believable (Bell and Bryman, 2015). Multiple factors could hamper this: such as poor research design, leading questions, biased researchers or misinformed interviewees. We tried to overcome this by following the advice suggested by Lincoln and Guba (1985). The authors stress the three pillars *prolonged engagement, persistent observation and triangulations* as techniques to ensure credible findings and interpretations. *Prolonged engagement* refers to the importance of understanding the context, test misinformation and build trust. We tried to "go native" by submerging into the literature and knowledge available in the field. More specifically, we investigated and evaluated extensive amounts of secondary data and talked to numerous experts to ensure understanding of the complexity of the subjects' contextual circumstances. Secondly, *persistent observation* addresses the need to focus and to identify the most relevant aspects. Our abductive approach enabled us to constantly challenge our assumptions and hence to target our focus to relevant aspects that became crystallized throughout the process. Lastly, the concept of *triangulation* stipulates usage of different sources of data. Thus, we conducted interviews, observations, research of secondary data and theoretical research consulting different sources, used different methods, and investigated different theories (Denzin, 1979).

4.4.2 Transferability

Transferability reflects external validity, aimed at describing the extent to which the findings are transferable to other contexts (Bell and Bryman, 2015). Conducting a case study limits the transferability of the findings to other contexts. Therefore, following the advice from Lincoln and Guba (1985) we clearly defined the boundaries and limitations of our findings and avoided to draw conclusions outside the practices of the designated market in GBA. We did our utmost by providing a thick description of the empirical setting, being fully transparent about the research process and highly systematic in our analysis.

4.4.3 Dependability

Dependability concerns the reliability of the research and is aimed at measuring the repeatability of the results (Bell and Bryman, 2015). While using an interpretative stance, it is important to distinguish between facts and the interpretation of the researcher (Flick, 2009). To comply with this, we carefully tried to ensure high quality of the collected material documenting the research process thoroughly (Flick, 2009). Further, we addressed the dependability aspect with the usage of inquiry audit (Lincoln and Guba 1985), meaning that we had an external supervisor with extensive research experience to govern and validate the stability of the process and methodological consistency.

4.4.4 Biases

As researchers, we exposed ourselves to the risk of systematic errors known as biases (Kendall and Buckland, 1957). We would like to highlight two types of bias, selection bias and researcher bias. Firstly, selection bias refers to the bias that might result from a non-randomized selection

(Heckman, 1977). In order to depict a market movement, our sample consisted of a diverse group of actors mainly within executive positions. The sampling bias was mitigated by extensive research on international waste management configurations for PET Bottles, which enabled us to identify the main actors in already established settings.

Secondly, we considered biases that might stem from us as researchers. As business and management master students from the Stockholm School of Economics, we are equipped and nurtured into using specific tools that could steer the research into a certain direction. To handle that, we consulted experts in the field and applied our methodology thoroughly, therefore developing a critical view that enabled us to break down the findings in a less subjective manner.

Building on the concept of reflexivity and reflection of the research, we have questioned and discussed our basic assumptions to avoid pitfalls. Moreover, we followed the advice from Gabriel (2015) and constantly tried to "look ourselves in the mirror" to realize that we were being shaped by the subject we investigated - and from that realization to the extent possible mitigate an impact on our results.

4.4.5 Ethical considerations

Stressing the concept of reflexivity further, we have done our utmost to conduct our research in an ethical manner. The investigated subject could be considered sensitive and in order to handle this, we made sure to ask the interviewees for permission to record and afterward asked for their permission to publish the quotes.

5 Empirical findings:

With the methodological approach in mind, our empirical findings follow the structure of our three aggregate dimensions: (5.1) Practices that shape the market, (5.2) Market Controversies and (5.3) the special issue: Urban collectors. These sections are then divided in accordance with each dimension's second order constructs.

5.1 Practices that shape the market:

The first part of the empirical findings introduces efforts that shape the market. Such efforts have been categorized in the sections (5.1.1) Normalizing Practices, (5.1.2) Representational Practices and (5.1.3) Exchange Practices.

5.1.1 Normalizing practices:

The empirical findings suggest that both (5.1.1.1) global and (5.1.1.2) local efforts are actively shaping normalizing practices in GBA. Regarding the former, beverage producers, organizations, NGOs and academic institutions affect practices concerning aspects such as policies, regulations and standards. Regarding the later, local efforts to shape legislation are the main driving force. On this we will elaborate further, visualizing the impact of these actors in the transformation of the market.

5.1.1.1 Global efforts to influence the local setting

Among the major actors that influence the normative practices are global beverage producers with presence in GBA. Our findings show that producers define global policies and guidelines for how CE should be applied locally and Danone and Coca-Cola are among those engaged. As exemplified by Mariale Alvarez, manager of corporate affairs at Coca-Cola Argentina:

"We have a global objective where we want to recover the equivalent of the 100% plastic we use in our bottles by 2030."

Mariale Alvarez continues and describes how the strategy is executed:

"Coca-Cola has global teams that help develop guidelines, but the work is done locally."

However, respondents claim that establishing global best practice in GBA is challenging provided the relative underdevelopment of CE in the region. Therefore, an iterative process of local adaptation to global policies seems to take place. Moreover, as a part of the global community, these international producers are influenced by global certifying organizations that set standards in relation to sustainability and CE metrics. One example of that is Danone's decision to apply for Bcorp certification, as Ana Guerello, Nature & Social innovation project manager from Danone Argentina describes:

"Last year Danone Argentina was certified by BCorp that certifies companies with objectives besides financial such as caring about people and the environment."

Another group of actors that exercise global influence on markets are global organizations. The empirics provide examples of how global organizations affect the local legislative processes. Currently, the main influencer in Argentina appears to be the OECD, an organization that helps improve public policies by disseminating global best practices. Argentina is working towards a membership in this organization and the efforts have increased during the current administration (FT, 2017; MRECIC, 2017). The OECD requires countries that aspire to join the organization to comply with certain prerequisites in order to be admitted as a member. Among these requirements is an EPR legislation, emphasized by the previous national deputy Alcira Argumedo and acknowledged by the state advisor and environmental consultant Carina Quispe:

"The EPR legislation and the environmental impact assessment are requirements to enter the OECD. That's why now, suddenly, we are very interested in regulating."

Argentina's ambition for membership forces it to comply with international standards, and consequently global CE policies seem to influence local normative practices. Further, institutions with a direct impact on the financial well-being of Argentina have followed the same path and stipulated CE regulations. As put by Carina Quispe:

"The Inter-American Development Bank and the World Bank said that they will not lend money if there is no well-made environmental impact evaluation."

More specifically, earlier this year the UN published their 'Waste Management outlook for Latin America' in an effort to influence legislators (UN, 2018). Carina Quispe described how the presentation of the report disseminated through the chamber of legislators in a more practical way:

"Villalonga [National Deputy] asked the chairman of the committee environment of the Congress to send the invitation to all the deputies, so everyone in the Congress found out about the UN report. We do many events to disseminate this topic, Villalonga is very focused on climate change and renewable energy but also in CE."

Findings also show that producers reflect upon the application of specific regulations in other regions of the world. For instance, the 2025 objectives to collect 90% of all single-use plastic bottles within the EU (EC, 2018). Ana Guerello at Danone elaborates this:

"Two months ago, we were noticed of the European legislation regarding plastics and we said to ourselves: 'ok guys this is happening in Europe, be aware of this because in a couple of years Argentina might do something similar'."

Moreover, findings show that global NGOs such as the Ellen MacArthur foundation are also influential actors for the change towards CE. For instance, Tamara Artusi from Fundación Metropolitana that works closely with the government and other actors in the waste management sector tells us:

"We fully rely on the definition of Ellen MacArthur, reusing and maintaining the materials as long as possible in the economy. Working with the products to be designed for recycling and enforcing citizen commitment. "

The example displays how definitions and conceptualizations that are taken from global actors seem to influence directions of local practices. Further, we see how this inspire actions, as put by Tamara Artusi from Fundación Metropolitana:

"We started to work with CE and found centers working with this abroad. We collaborated with another NGO and created (...) the first CE center in Argentina (SEC)."

Finally, our findings show that research by foreign academic institutions depicts global best practices as useful material for legislative discussions. Such an impact of foreign research on local discussions was identified during the UN conference where research conducted by the Swedish scholar Thomas Lindhqvist, highly influential in the development of EPR in the Nordics, was used as the basis for the legislative discussions. Acknowledged by Carina Quispe:

"The concept of EPR by Lindhqvist is the one we follow in the development of the project. I am in charge of developing the EPR in the chapter on governance [UN environmental report], and the perspective follows the outline of his literature."

5.1.1.2 Local efforts to shape policy

Our empirical findings display local efforts to shape market policies with different levels of success. As suggested by various interviewees, at least three parallel EPR proposals have been discussed during the last two years in Argentina. Although these proposals have some differences, the common denominator concerns reassigning responsibility to actors involved in the economic loop of resources. Carina Quispe, who has been working with a group of legislators on one of these proposals describes:

"I believe that EPR would make a fundamental change, it will decrease the amount of waste that gets treated improperly. (...) as it will transfer some of the responsibility from municipalities to companies."

Guillermo Celaya assisted to the former National Deputy Alcira Argumedo in the creation of a previous and slightly different EPR proposal. Guillermo Celaya further expanded on the differences among EPR legislations:

"There is one proposal that in the jargon is called 'the one for the companies'. And then there is ours that considers social inclusion."

Although such EPR proposals put different levels of emphasis on social and economic aspects, legislators seem to agree on that the development of producer participant laws requires high levels of coordination among actors in the value chain in order to be successfully implemented. Atilio Savino, president and founder of ARS (Association for studies of solid waste) is trying to facilitate this:

"From ARS we always try to push [for this law]. We had several meetings with producers and other key actors, to discuss a law."

Mariale Alvarez from Coca-Cola highlighted that coordination among members of the food industry is one important driver for the creation of such legislation. She explained:

"We have been discussing packaging laws for the last 10 years at least. (...) 2-3 projects are presented every year to the Congress but none get passed. (...) it's very difficult to unite the producers behind one packaging law as it concerns all food and beverage packages, and you need to bring aspects from several industries."

5.1.2 Representational practices:

The legislative process requires understanding of the market to evaluate an adequate EPR legislation. As described by Lindhqvist (1992), an essential aspect of this process is the establishment of information systems. In the following section, we elaborate on findings related to describing the market, namely representational practices. First, (5.1.2.1) we describe an absence of unified measurement methods and how actors are trying to solve that. Second, (5.1.2.2) we introduce a lack of knowledge and actions taken to solve it.

5.1.2.1 Measurement methods

One of the major issues that our empirical findings display is a lack of statistical information and data about waste management and its related activities. With no official statistic institution for waste management in place, neither public nor private organizations are systematically collecting, processing and analyzing waste management data. As elaborated by Carina Quispe and Sustentar, the only sources available are partial and uncoordinated and belong to organizations such as CEAMSE, the municipalities, the beverages producers and trade unions. Tamara from Fundación Metropolitana NGO also explained:

"We need information about what is happening in GBA, today there are no statistics."

We have identified efforts to create a national institution that embodies the role of a national statistical organization for waste management. The 'Secretary of Environment and Sustainable Development of the Nation' created the "Observatorio Nacional para la gestión integral de residuos sólidos urbanos" (ONGIRSU, 2018) or national observatory for waste management. However, the latest communications we could find on their webpage and social media platforms were from late 2016 and the latest reports from 2012. As described by Atilio Savino of ARS:

"You need a central direction on how to collect information. But it needs to be systematized (...). The national observatory was a good initiative but, (...) following a change of politicians, it disappeared."

There are also similar initiatives at a regional level where actors collaborate to launch and operate a regional observatory. Rodrigo Rodriguez Tornquinst describes the case of the Observatory of CABA, where the NGO Sustentar together with UBA (University of Buenos Aires) cooperate to

develop knowledge about waste management and foster improvements for the waste management system of GBA.

5.1.2.2 Disseminating knowledge

Provided the lack of knowledge regarding waste management and sustainability, several actors have engaged in knowledge creating activities. For instance, waste management companies have focused on educating children. As put by a representative from CEAMSE:

"We have a very extensive visual program with visits from thousands of kids every year where we get to introduce them to the basics of waste management and how to recycle. "

NGOs have taken a leading role in this educating process as well and have further engaged in stipulating measurements, establishing standards and providing tools that facilitate recycling activities. Fundación Metropolitana has been engaged in creating communication tools that disseminate information regarding the importance of adopting CE. Tamara Artusi describes:

"We made a documentary that it is called "waste in the age of CE" that raised the issue of overconsumption of bottles and explained the pollution that the absence of plastic recovery generates."

They have further developed a digital platform that addresses the same issue. Tamara Artusi explains:

"It provides statistics about the waste management activity in GBA (...) and it influences public policies. We develop thematic forums where we choose a problem, call a specialist, make a framing, map actors, and call them to discuss this issue in order to seek recommendations for public policies. We later arrange a meeting where these recommendations are disseminated and delivered to the political decision-maker. "

Other institutions have also identified this issue, among them universities. Roberto Candal, an associate professor on the University of San Martin (UNSAM) exemplifies with an initiative executed by one of his colleagues for the Cartoneros:

"We organized a course for Cartoneros teaching them how to identify different plastics types. The purer their collected plastics are, the more money they earn."

Further, UNSAM arranged a conference on CE to engage academia and foster collaboration with the industry. Soledad Villaverde, a researcher from UNSAM explains:

"Last year we organized a conference about CE (...) where we connected environmental engineering students with industries"

Building on this, the Association for the study of solid waste (ARS) that belongs to the ISALUD university in CABA, has also engaged in disseminating ideas about CE. As described by Atilio Savino of ARS:

"We made an EPR forum last year with ISWA (The International Solid Waste Association) where we reviewed global waste management best practices and where all the relevant actors were invited."

5.1.3 Exchange practices:

The empirical material further displays the presence of a myriad of independent initiatives performed by various actors in attempts to shape the market. Atilio Savino comments on this:

"You know that everybody likes to be fashionable. CE is now fashionable and the proper thing to do"

More specifically, NGOs, universities and private producers have actively engaged in waste management practices in general, and actions related to PET Bottles in particular. An example of practical initiatives emerging from NGOs is that of Geofans, which helped establish new general waste management practices by voluntarily collecting the dry waste and increasing recycling levels in the municipality of Vicente Lopez. Francisco Galtieri, founder of the NGO, describes the initiation of the project:

"We started with 20 houses, and after two months 500 people had subscribed (…) We told people to put their dry waste outside their houses every Saturday and we collected it and transported it for further recycling."

Through successful coordination and collaboration with the local municipality, Geofans was able to grant financial support and formalize the activities to cover 100.000 households and collections of 180 tons monthly. Furthermore, producers have also launched initiatives to foster circularity. Ana Guerello, from Danone introduce their activities:

"In 2012 CE came up on the agenda and we realized that we are part of the problem of plastic pollution and that we wanted to include recycled PET (rPET) in our bottles. (...) Now we have 50% of recycled PET in the bottles of Villavicencio brand. This was the first bottle in Argentina with that high level of rPET.."

Ana Guerello further explains that the three objectives Danone perused when engaging in these activities were, social by providing legal jobs for the informal workers, environmental by generating circularity and economical by increasing access to rPET, a useful marketing claim. Ana Guerello explains:

"This project is (...) social because we help these people achieve better working conditions and consequently improve their living standards (…) [It is environmental because] we are working with the collection of the materials. And from an economic point of view, it helps the business because we have recycled plastic in our bottles and that enables marketing campaigns related to this."

The supermarket chain Makro introduced a similar initiative to collect PET Bottles and stimulate social inclusion, executed in cooperation with a municipality and Coca-Cola. Eduardo Mañé, sales director at Makro describes:

"We are doing a bottle collection activity (...) 50% is funded by Coca-Cola, we cover the other 50% while the government subsidizes part of the salary of the Cartoneros who handle the collected materials."

Similarly, Socse, who distributes technology for the collection of PET Bottles, explained their attempt to facilitate collection by installing deposit machines in connection to grocery stores. As put by the general manager, Carlos Willems:

"We installed a collection facility in a collaboration with a supermarket chain. We built a house where we placed machines that were connected to a loyalty card and customers received credits when they placed their bottles in the machines."

Producers also seem to evaluate the inclusion of collection technologies. Ana Guerello from Danone explained:

"We are analyzing it [investing in deposit machines] but the machines are very expensive."

Similarly, Coca-Cola is working on a pilot study to test the effects of implementing a deposit scheme . As Mariale Alvarez from Coca-Cola explains:

"We are trying to make controlled pilots. Deposit schemes are very easy to enter, but hard to exit from."

5.1.4 Concluding remarks

The findings visualize several independent efforts that simultaneously shape the market. First, we described how global and local actors influence policies and how these practices are managed locally. Second, we outlined the empirical description of the market as characterized by an absence of information and knowledge, and how this absence spurs practices to drive change. Third, we described how actors facilitate practices related to CE through individual practical initiatives. *Table 1* displays an overview of the market practices executed by different actors.

	Normalizing practices	**Representational practices**	**Exchange practices**
Academic institutions	- Depicting global best practice	- CE conferences - Educating UCs - Launch of observatories	
Environmental Agencies of CABA and Municipalities		- Launch of observatories	- Municipalities finance collection of recyclables
Global organizations	- Stipulating global guidelines and requirements	Situational analysis (UN outlook on WM in LATAM)	
Legislators	- EPR discussions	- Situational analysis (UN outlook on WM in LATAM)	
NGOs	- Disseminating global definitions of CE	- Production and distribution of educational material - Digital information platform - Launch of observatories	- Collection of recyclables (Green Day)
Producers	- Global internal policies	- Bcorp Certifications to measure performance -Market research	- Increased usage of RPET - PET BCs collection - Deposit Scheme Pilot - Sustainability Market Campaigns - Activities With Cartoneros
Technology providers			- Deposit Scheme Pilot
WM companies		- Educating in schools - WM performance measurement	

Table 1: Overview of practices executed by different actors

5.2 Market Controversies

The second section of our empirical findings describes market controversies in GBA. To illustrate these findings, we will introduce (5.2.1) conflicts in current norms, (5.2.2) different views on waste management responsibility and (5.2.3) conflicting definitions of CE.

5.2.1 Conflicts in current norms

The empirical findings display two types of conflicts in current norms. Firstly, municipalities are the only actor legally responsible for the operationalization of waste management. Municipalities seem to have different and, in many cases, insufficient resources, capabilities and infrastructure to properly carry out their duties. Consequently, the national law that stipulates minimum standards for every jurisdiction might be too demanding for some municipalities and too easy for others. As Guillermo Celaya elaborated on, and Carine Quispe explained:

"Government officials from some municipalities don't have the same capabilities that CABA [city with greater civil and economic development] has. (...) which makes it is difficult to align national criteria."

Secondly, the waste management system seems to suffer from the absence of coordination between the legislations of neighbor municipalities. For instance, CABA and the suburbs have various overlapping legislation criteria that bring high complexity to the normal operationalization of activities related to waste management. Carina Quispe elaborates on this:

"Within each level [provincial and municipal] you will find that there are contradictory rules, one defines solid waste in one-way and another defines it differently. The first thing to achieve in Argentina is a federal legislation that is univocal and handles the coordination among provincial and municipal levels of government to make waste circulate."

Clashing legislations have important impacts on the development of exchange practices related to waste management. Conflicting legislations generate issues with logistics and the capacity to reach economies of scale, which in the long run is correlated with a lack of investment in the sector. Carina Quispe further exemplified:

"There are no economies of scale to build a tire recycling plant. For it to work and be financially viable, it needs to receive tires from many jurisdictions [to reach a sufficient volume], so if you have those prohibitions [limitations on transportation of certain materials from one municipality to another] there will neither be scale nor a company interested in running it."

5.2.2 Different views on waste management responsibility

The previous section displayed findings from a setting in which distribution of responsibility is clear. In general though, the coordination of responsibility among other actors seems to be rather absent. We describe two major findings related to this by elaborating on (5.2.2.1) distribution of responsibility to producers and (5.2.2.2) the responsibility of the consumer.

5.2.2.1 Responsibility of producers

Discussions and negotiations for EPR policies have taken place for a long time. EPR-legislation implies a change in the distribution of responsibility towards producers. However, various actors claim that producers are either not interested, or incapable of dealing with that responsibility and therefore opposed to it. As elaborated by legislators and explained by a representative from CEAMSE:

"Legislators are working on the law, but many producers are working against it"

Our empirical findings display four main reasons why producers are not supporting such legislation. Firstly, producers are concerned about the implications that such laws would have on their daily business operations and bring such concern to the legislators. Alcira Argumedo, exemplifies this:

"The producers don't want us to get involved with the aesthetics of their products because the packaging is the key to their marketing and their ability to sell their products."

Secondly, EPR legislations could imply a negative financial impact for the producers as the legislation implies that the negative externalities that stem from the disposal of the products are to be financed by the producer. Acknowledged by Juan Pablo Barrale, manager of corporate affairs on Argentina's second largest brewer CCU:

"It's probably something more costly, it will be more expensive for all of us"

Thirdly, producers see cost deriving from the absence of political enforcement. A policy would create unfair competition as the government's limited capacity to control smaller producers will create restrictions only for major producers. Atilio Savino from ARS elaborates on this:

"Coca-Cola has developed their products over the years and don't want to pay as much as someone who has not developed their products. They are against free-riders."

Lastly, the faith in the ability of a single policy to change the current configuration to an effective scheme is very limited. As acknowledged by Ana Guerello from Danone:

"The recycling industry here is very informal and it's very hard to drive change. "

In contrast, legislators emphasize the importance of putting the responsibility on producers due to their core position in the productive chain. Carina Quispe, working with the current law proposal explained:

"Producers are not responsible today, in spite of being the ones that can make the decision not to put for example, 5 wrappers to sell one product, or using efficient and recyclable packaging."

Legislators claim that producers are not forced to acknowledge the environmental externalities resulting from their operations and that an EPR legislation would help better assign the responsibility for the management of such externalities. As Carina Quispe explains:

"...the argument that it's expensive to clean up and take care of the environment with an EPR law is false, because we are not comparing it with the real cost that we are facing in health, (...) climate change and disaster risks where the costs are even higher."

5.2.2.2 Responsibility of consumers

Circularity requires active participation from the entire value chain. Consumers, as the users and disposers of the products, are at the core of such configuration. A major finding is the low level of knowledge about CE among citizens and the low level of sustainability in practice. Acknowledged by Ana Guerello from Danone:

"People are in general terms not worried or concerned about environmental issues."

NGOs rather emphasize that the most important drivers of change towards CE are citizen engagement and education. As elaborated by several NGOs and emphasized by Tamara Artusi:

"The state can do a lot of things, but if there isn't a cultural change of responsible consumption, we will never reach the CE."

The challenge to assign responsibilities to specific individuals renders the problem of waste, one of whom no one is held accountable for and thus makes it a complex matter to solve. As Francisco from Geofans stated:

"This resembles the tragedy of the commons, people don't think that their impact on the environment makes any difference. The theory says that if you measure the impact of every person, you break the tragedy of commons."

One reason for this behavior seems to be distrust towards both government institutions and waste management companies. A CEAMSE representative explained:

"People don't separate because they think that here we just add everything together."

Gabriel Vanelli, Director of environment and resource efficiency from the municipality of Vicente Lopez described how this plays out in their municipality:

"We cannot use the same type of truck to collect recyclables as the one that collects other types of waste because people think that it is the same truck and it will go to the same place."

5.2.3 Conflicting definitions of CE

Furthermore, the findings display a recurring issue related to the lack of a unified understanding of the CE theory. Our empirical studies and secondary data research show that different actors define

CE in different ways and that this seems to result in disagreements regarding the appropriateness of the waste management techniques used. Such a situation is illustrated by Atilio Savino from ARS:

"CEAMSE runs sanitary landfills (...) They claim they are doing CE since they are also producing energy. I think differently, landfills are still used as landfills, products are collected, mixed and not recycled."

Waste to energy seems to be understood as CE by some actors, while such practices are rather considered transitory techniques towards CE by others. Mariale Alvarez from Coca-Cola elaborates on this:

"CE is fashionable, something that has glamour, and everybody is talking about it. But really, it's not CE what they are doing. Initiatives are very good and might have a positive impact on the environment or help solve social issues, but they are not circular (...). Many projects are still linear and do not close the loop. (…) To do circular businesses, you have to design the system from the beginning, and that's difficult."

Building on this idea, Ana Guerello from Danone introduced the case of a law that has recently been passed and paused due to citizens' and NGOs' demonstrations, claiming that inclusion of incineration would be at the expense of reduced levels of recycling and hence circularity:

"Last year there was a law concerning incineration of waste in the city that was discussed in the Congress but not implemented. People thought that much of the waste that today is recycled might instead be burnt."

5.2.4 Concluding remarks

The findings show that the transformation of the market towards CE encounters several controversies. Conflicting norms aggravate coordination and execution, inconsistent views on responsibility emerge as producers and legislators have different views on the implications of an EPR law, and conflicting definitions results in incoherent efforts.

5.3 The special issue: Urban collectors

An important sector of waste management in GBA seems to be that of the Cartoneros, or 'cardboard men', who collect recyclables and sell them to the recycling industry. The sector is composed both by legitimized collectors formally organized in cooperatives called urban collectors or 'Recuperadores Urbanos' (UCs), and by informal workers that usually work independently and in the jargon are called Cartoneros. We describe this unique phenomenon by (5.3.1) introducing the process that led to the emergence of this market practices, (5.3.2) describing the interrelation this sector has with other actors and (5.3.3) describing the major implications of the emergence of this sector.

5.3.1 The emergence of UCs and the effect on waste management practices in GBA

As mentioned, in the year 2001 Argentina suffered a crisis with significant social and economic impacts. According to the National Institute of Statistics and Censuses (INDEC), it is estimated that by May 2002 poverty affected 53% of the population while only 32.8% of Argentineans were employed (INDEC, 2010). This situation pushed thousands of citizens to engage in the collection of recyclables that could be exchanged for money in the recycling industry. Although the activity of collecting recyclables was already in practice before 2001, the crisis transformed it into an activity with high economic impact and social visibility. As Eduardo Marcelo Catalano, an official coordinator from the urban collector cooperative 'Cooperativa Recuperadores Urbanos del Oeste' (CRUO) explained:

"What was once a marginal activity in CABA, became highly socially visible with important economic impacts in a matter of two years."

Further, Carina Quispe states that these activities generated an impact on environmental responsibility and changed the value perception of waste:

"They organized to recover materials and began to create awareness in GBA. Since 2001, I separate at home and never mix something that could be recycled with non-recyclable waste."

The increasing number of informal workers seem to have transformed the structure of the waste management system and the first change was related to transportation. Following the rapid increase in people dedicated to collection activities, the companies responsible for the public railway offered Cartoneros an exclusive daily transportation service between the capital and the province. As Eduardo Marcelo Catalano from CRUO explained:

"They began to travel in the public trains with carts and bags full of garbage along with the rest of the citizens and that generated problems of coexistence, for that reason they [railway companies] opted to give special services for the Cartoneros."

In order to tackle practical aspects of the use of the services (e.g. time of departure, number of service users), cartoneros started to organize by neighborhoods and gathering in common coaches regularly, which allowed them to get to know each other and create a shared identity (CRUO, 2018). This was the first step in the emergence of Cartoneros' organized structures.

In 2002, the government of CABA formalized Cartoneros working status by implementing a law that stipulated subsidies for those collectors who registered under the by then current labor legislation (law 992/02). This led to the creation of the 'Registry of Collectors' (RUR) in 2002. The legislation made cartoneros visible and legitimized them as UCs, an actor legally linked to the recovery of recyclable materials in CABA. To organize informal Cartoneros into cooperatives of UCs, the government created an organization called "Program of UC", later transformed into the DGREC (General Directorate of Recycling) in 2007 (decree 2075/07). This enforcement body was in charge of operationalizing the process of legitimation through the creation of norms (e.g. not

bringing kids, arriving on time, not breaking public garbage bags, working sober) as well as through the provision of tools that Cartoneros needed for work (e.g. uniforms, gloves, transportation). In the years to come, cooperatives kept on growing, gaining greater levels of political power and stronger relations with trade unions known as MTE (Movimiento de Trabajadores Excluidos) and CTEP (Confederación de Trabajadores de la Economía Popular).

As explained by Sustentar and Eduardo Marcelo Catalano, nowadays the 12 cooperatives recognized by the government consist of 5.000 registered UCs. However, between 7.500 and 10.000 informal Cartoneros are still active in CABA. Most UCs belonging to registered cooperatives have two incomes, an incentive from the government and a payment that cooperatives provide in exchange for the collected material.

According to most interviewees, cooperatives of UC are today an integral part in the management of recyclable waste, therefore efforts have been done to integrate them as a key component of the waste management strategy. For instance, as Eduardo Marcelo Catalano from CRUO explained:

"The government assigned each cooperative a part of CABA in which they are responsible for the collection of dry urban waste."

Cooperatives manage three sources of waste. First, recyclables are collected on the street by individual UCs. Second, recyclables from big generators (e.g. hospitals, factories, shopping centers) are systematically collected with trucks. Third, recyclables are also collected from 'green points' located in CABA. Both, waste from big generators and from public recycling 'green points' arrive in bulk and have to be sorted since users fail to properly dispose of dry and wet waste separately. As Eduardo Marcelo Catalano from CRUO also explained:

"Of the 1000 tons per month that our cooperative collects, 200 are discarded because citizens fail to separate correctly."

Eduardo Marcelo Catalano further explains that once the materials are collected, they are packed and sold to recycling industries.

5.3.2 Interrelations with other actors

Our findings show that the UC sector is highly involved in different activities through collaborations with other actors in the waste management process such as waste management companies, retailers, the government, beverage producers and NGOs. We will elaborate on these relationships in the following section.

Firstly, UCs are collaborating with waste management companies through the establishment of sorting plants. According to CEAMSE, sorting plants were installed inside their premises to allow people from neighborhoods nearby to work with waste categorization assisted by mechanical belts. Such initiative emerged in an effort to handle the numerous Cartoneros that entered the landfill without permission to collect material.

Secondly, we also found cases in which retailers cooperated with cooperatives. As previously discussed in section 5.1.3. Makro installed collections points of PET bottles where UCs picked up collected materials for further recycling.

Thirdly, UC cooperatives apparently have strong connections with legislators with whom they coordinate efforts to influence regulations. For instance, Alcira Argumedo and Guillermo Celaya were part of a two-year project to work along with UCs on a law of packaging with social inclusion in Argentina. Guillermo Celaya described the process:

"We wrote the law together with the UCs and met weekly for months. Once we had it quite done we discussed it with the producers, with the chambers, and with the intendants."

Fourthly, we also identified cases in which beverage producers and cooperatives of UCs coordinated efforts to launch sustainability campaigns. For instance, Danone's "Rebotella" campaign that coordinated collection of PET for recycling that enabled 50% rPET inclusion. As Ana Guerello from Danone explained:

"In order to include recycled PET the bottles needed to be collected - and that was how we started to work with the cooperatives in the city of Buenos Aires."

Lastly, as a means to foster the development of new production processes, the CRUO organization has also worked with NGOs and academia to develop technology that allows them to integrate the transformation of the collected plastic into garbage bins that would be sent to different areas of the city. Furthermore, as discussed in section 5.1.2. UNSAM university collaborated with UCs delivering courses and training programs.

5.3.3 Major implications of UCs

The process of transformation whereby the UCs were coordinated and legitimized both by the law of CABA and by market actors had to two major implications. First, it seems to have enabled UCs to gain political strength and with it, to influence in the legislative processes. A clear illustration is the project of the EPR law with social inclusion previously introduced, which although not approved in 2017, was described as an act of empowerment for UCs by Guillermo Celaya:

"The most important change we saw was that Cartoneros appropriated the Congress. They felt it also belonged to them."

However, the legislator explains that the reason for the halt of the project of law was mainly internal disagreements among UCs. Guillermo Celaya explained:

"The project was almost finished, but at one point new people from the Cartoneros' group started to make it very complicated to reach an agreement. They began to ask for more, which brought chaos to the meetings and slowed down the project."

Building on the complexities of such process, Carina Quispe, currently working for another national deputy, explained:

"UCs have systematically opposed the packaging law because they have presented a parallel project in which the producers responsible for the EPR management system must hire them. But the law of packaging is not a law of social subsidies, and beverage producers who are already anticipating that they will have a significant cost to comply with the law of packaging do not want to take charge of a structural social issue of Argentina."

Secondly, Carina Quispe's quote above also illustrates that the emergence of Cartoneros forces the waste management system not only to focus on economic and productive objectives related to the maximization of CE efficiencies, but also to include social issues. These different objectives are considered clashing by several actors in the network. As described by Atilio Savino from ARS:

"Here in GBA, the dry waste is collected by Cartoneros. They are inside the scheme, but their interpretation is that they should manage it, but this is a little bit difficult. As the interest between their thinking and the companies' thoughts are very opposing. It will be hard to reach an agreement with these terms."

Carina Quispe pointed out these contradictions further by describing signs of inefficiencies:

"It [an EPR scheme] is not a system of employment for unemployed people (...) And there is another fundamental issue when you are given a subsidy, you don't have an incentive to recycle more because you are going to have that money anyway, therefore UCs recover little."

Discussions to coordinate the perspectives are taking place, but they seem to face some complexity. Francisco Galtieri from Geofans explained:

"From a social perspective, it's good that they have jobs. On the other hand, they are very disorganized and don't recycle everything (...) we should find a way that makes them a part of the solution. (...) There should be a way of working with them on a scalable level, but that's the big challenge."

Furthermore, Carlos Willems from Socse explains:

"You can incorporate the informal workers in many ways. (…) But the volume and the scale of the waste that we produce is too big. (...) We have to work together to show that the new tech is not a threat, but rather a way to include them in a healthier and safer environment."

5.3.4 Concluding remarks

It seems rather clear that the emergence of this sector had a huge influence on the development of the waste management of recyclable goods. More specifically, our empirical findings show that the impact of UCs has far-reaching effects on the production of exchange initiatives as well as legislation and norms. Although UCs' work with the collection of PET bottles enables some degree of CE through recycling, this practice emerges as a means to a social end, rather than an activity with the focus on maximizing CE efficiency. Consequently, generating various degrees of contradictions in the system and among different actors.

6 Discussion:

In this section, we analyze the empirical findings from the perspective of our theoretical framework by addressing our two research questions. First, (6.1) we discuss how CE performs the practices that shape the market for PET bottles. Second, (6.2) we discuss how multiplicity affects how CE performs the market for PET bottles and how controversial practices in the market are coordinated.

6.1 How CE performs the practices that shape the market for PET bottles?

The empirical findings display a number of ways in which ideas and theories about CE are performing the three interlinked markets practices that contribute to shape the market. We have identified various phenomena related to these practices that we will discuss in this section as illustrated by *Figure 9*.

Waste management in GBA appears to be characterized by low level of circularity, meaning that most current market practices - (1) normalizing, (2) exchange, (3) representational - displayed in our findings are more in line with a linear logic than with CE. Empirics display that (1a) national rules seldom are complied with because they are not adapted to the tools - resources and capabilities - that the 24 different municipalities and CABA rely on. Additionally, the enforcement of such rules requires cooperation among politicians from many different (2a) political parties with opposing interest. These clashing interests render coordination and consequently enforcement hard to achieve. Moreover, normalizing practices in GBA also seem uncoordinated as certain (1b) rules in CABA and BA province are overlapping and in conflict with each other. For instance, we devised cases where important regulatory criteria are defined differently in BA and CABA, thus reducing the possibility for recycling industries to achieve economies of scale while also hampering investment attractiveness and regulatory trust. (Carina Quispe, 2018). Even in CABA where the (1a) ZERO waste law stipulates that waste should be collected and disposed separately (Law 1854, 2005), (3a) recycling rates seem to remain low, partly because citizens are not equipped with the appropriate (1c) tools to comply with it (e.g. education, communication, accessibility, infrastructure). Although current (2b) exchange practices (e.g. green points and the UCs) facilitate separation and collection of PET Bottles, the majority of the PET Bottles consumed in GBA are still mixed with other kinds of waste and landfilled by CEAMSE.

Furthermore, empirics show that waste management responsibility for PET Bottles remains unregulated since the appropriate treatment of such material is not specifically normalized. In this context, legislators further argue that EPR legislation could accurately assign responsibility to producers and thus lower the pressure on municipalities, which rely on very limited budgets and capabilities to handle waste in a circular manner.

Moreover, actors in the market who see these general (3b) images of inefficiency, seem not to count with reliable (3c) measurement methods to create accurate descriptions of the situation. This

is reducing the ability of actors - legislators, producers and NGOs - to understand the environmental impact and to devise coherent plans to improve the level of circularity. To handle the lack of data, the government of CABA jointly with the government of BA launched (1d) an observatory, a public organization that will enable the generation of re-presentations to provide a coordinated and systemic measurement of waste management practices. This initiative was based on the cooperation between Sustentar and the UBA University. Moreover, to address descriptions of structural lack of circularity and unclear definition of responsibilities in regard to the management of PET Bottles, legislators started to develop (1e) EPR law proposals during 2017. These emerging rules are not the only attempts to shape norms but rather some of many attempts with different directions. Legislators further highlighted beverage (2a) producers' resistance to collaboration, as EPR-rules would interfere with their interests as changes in their exchange practices are associated with significant costs. In contrast, the major beverage producers have argued that although such laws might help acquire the tools required to address their CE global objectives, they fear it would put the responsibility of the entire industry on a few actors.

Images of inefficiency in GBA arise both from re-presentations at local and global levels. Locally, legislators and NGOs have been analyzing the current situation of waste management in GBA and created descriptions of a system with severe inefficiencies in circularity that could be improved by implementing CE practices. Globally, studies such as the (3d) 'waste management outlook for LA and the Caribbean' of the UN work as re-presentations that create images of waste management system inefficiencies. This myriad of local and global re-presentations has generated descriptions of the market that seem to have triggered efforts to shape current market practices. Along with such representational practices, (1f) global organizations are also involved in normalizing practices. ISWA for instance, with its 'EPR forum' uses best practices and templates from abroad while OECD, WB and IADB define guidelines that put CE as a normative objective to be complied with for members and collaborating nations.

Global ideas about CE affect the local setting through global producers that establish (1g) corporate policies and guidelines that are consequently translated into tools that partake in exchange practices in GBA. These practices have taken multiple directions such as (2b) the inclusion of Cartoneros in private collection programs (CCU; Coca-Cola; Danone), the (2b) establishment of infrastructure that enabled recycling through privately launched deposit schemes (Socse, Makro, Coca-cola), the (2b) inclusion of 50% rPET in PET bottles and the sustainability marketing campaigns (Coca-Cola; Danone) and the (2c) certification of CE standards by producers (Danone). These various CE exchange practices suggest that although citizens' awareness and concern for CE and sustainability-related matters are not considered high, producers still see CE as an emerging trend and engage in the development of such credentials (CCU; Coca-Cola; Danone).

This increased attention facilitates representational and exchange practices among NGOs and Academia as well. For instance, findings show NGOs and Universities engage in educational activities (ARS; Fundación Metropolitana; UNSAM) and disseminate working standards to help Cartoneros improve the quality of their collection (UNSAM). Moreover, NGOs also facilitate devices that enable CE exchange practice. For example, providing (2d) bags for recyclables and special collection services for recyclables (Geofans).

Interestingly, most exchange practices appear to be isolated rather than systematically coordinated. We could consider this as a case of strong but partial performativity as it seems that CE theory shapes mainly exchange practices although non-exclusively. This could possibly explain first, the independence and the lack of coordination of such practices as these are not supported by the current norms, and second, the difficulty to evaluate their performance as the exchange practices are not reflected in market representations. More specifically, the isolation in these exchange practices can be related to the lack of policies supporting development of CE and to the low enforcement of current waste management norms that create a vacuum of rules and tools forcing the increasing number of actors who want to engage in CE practices to do so independently.

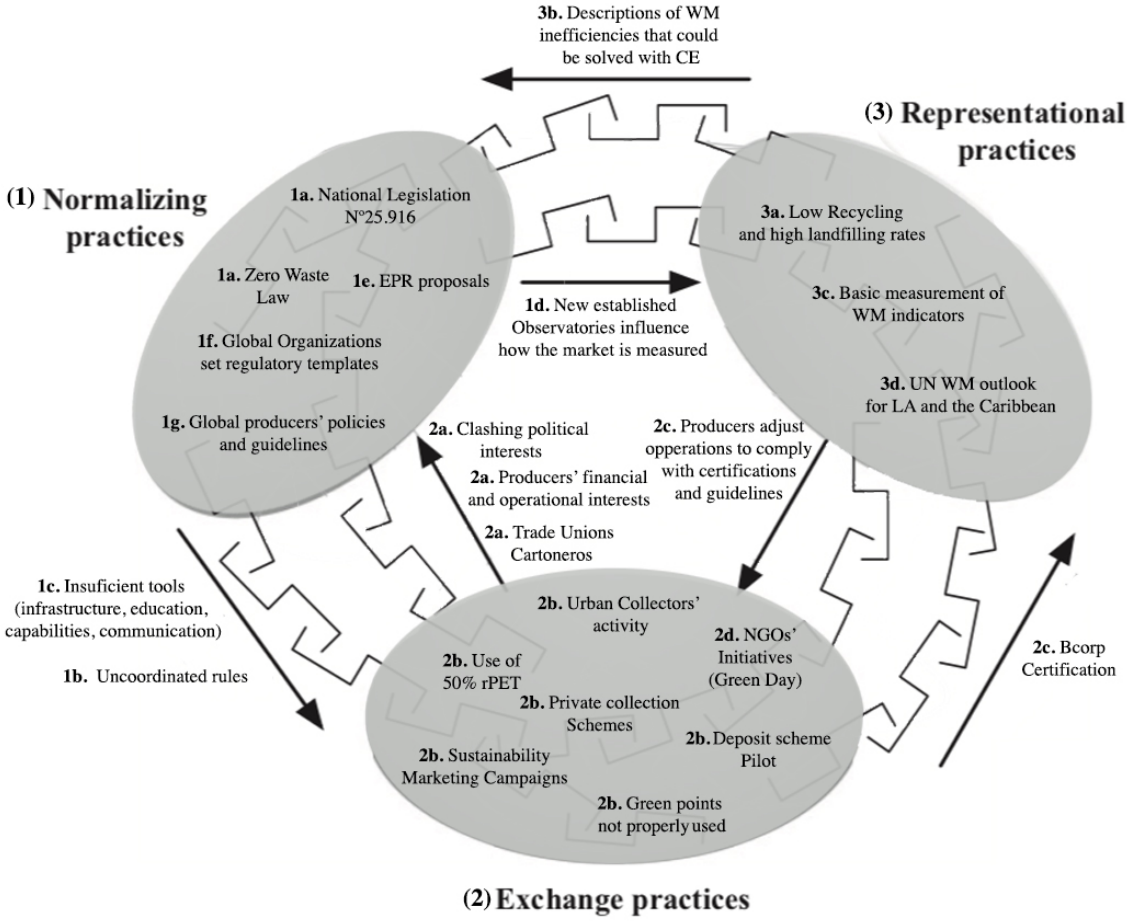


Figure 9: How CE performs the practices that shape the market for PET bottles. Summary of market practices and translations in the heuristic model of markets (adapted from Kjellberg and Helgesson, 2007).

6.1.1 Concluding remarks

We analyzed how CE performs the waste management practices in the market of PET Bottles. We explored how local and global re-presentations of waste management inefficiencies triggered efforts to modify normalizing practices in the pursuit of developing an EPR legislation. Such efforts to reform policies are not yet successful due to the existence of opposing interests and significant barriers that hinder development. We saw how re-presentations of a market that lacks data pushed actors to develop observatories that could enhance the generation of more accurate descriptions

of the market. We also explored how the influence of global producers' CE objectives help disseminate standards and ideas about CE in GBA and translate into local exchange practices, of an independent and isolated character. Apparently, the relevance of CE in GBA is increasing, although it lacks systematization and long-term perspective.

6.2 How does Multiplicity affect how CE performs the market for PET Bottles?

The empirical data displays that the market for PET bottles in GBA is characterized by multiple views of CE and of the practices this theory encompasses. Although controversies often coexist, in most cases, they generate friction and need for coordination. We have identified two major phenomena related to this. At a general level, (6.2.1) the concept of CE is being understood and applied in different ways with interesting implications. At a specific level, (6.2.2) we found that UCs have emerged and highly influenced both ideas about CE and how these ideas shape the market. Within these sections we will describe how multiple views on (1) Definitions of CE, (2) EPR legislation and (3) social and economic objectives, result in market controversies and how these controversies are solved (As seen in *Figure 10*).

6.2.1 Multiple views and definitions of CE that perform the market

The findings display (1.a) different, and sometimes conflicting views on CE. The concept is often confused with sustainability and this occasionally results in controversies as the practices are likely to take different and sometimes conflicting directions. To exemplify, incineration of waste has been considered circular by some actors as the process makes energy from waste. However, according to the theory, energy recovery is not considered CE because burning waste means downgrading resources and consequently leakages from the loop. This leads to misconceptions and inconsistent views on the perceived outcomes of certain practices. Although the government sees incineration as a necessary practice to reduce the level of landfilling, citizens and civil organizations demonstrated against such norm. They claimed that incineration would have worse environmental implications and successfully managed to delay its application, thus (1.b) postponing the coordination of such resolution.

Furthermore, although actors claim that many of the described exchange practices are CE initiatives, they are disqualified as CE for two main reasons. First, out of the myriad of isolated practices discussed previously most activities have components of sustainability and of social inclusion but no signs of economic viability. For instance, the inclusion of rPET in bottles (Coca-Cola, Danone), which is an environmentally friendly practice, is not perceived as economically sustainable by producers and thus it is entirely dependent on producers' ethical and sustainable objectives. Another example is the collection service provided by Geofans in Vicente Lopez that is entirely dependent on external financial support. Second, most practices do not emerge from a solid CE conceptualization grounded in theory, but rather arise as positive but independent and uncoordinated sustainability initiatives. For instance, the collection points implemented by Makro and Socse had positive sustainability and social impacts, but the lack of appropriate incentives to citizens and coordination with a wider set of producers of PET Bottles renders them unsustainable

in the long run. Common to all these illustrations is the fact that actors prioritize social and environmental objectives and compensate for the lack of economic viability with their own resources. While these controversial views on CE are widely present in the market, they avoid conflict with each other and therefore (1.c) coexist.

In other cases, neither of the matters are solved and coordination is postponed. For instance, (2.a) efforts to strengthen legislation are characterized by multiple conflicting views on how responsibility should be distributed. Legislators proposing EPR laws would likely transfer this responsibility to the producers. Producers, on the other hand, would most likely be hesitant to such a law since they claim that developing an EPR scheme requires big investments in infrastructure that today are non-existent in GBA and that would imply a big financial burden on them (Coca-Cola; CCU; Danone). Moreover, NGOs also have a different view of responsibility since they highlight that the main driver for further CE is changing citizens' behavior through education (ARS; Fundación Metropolitana). Apparently, (2.b) resolution of such controversial views has also been postponed so far.

6.2.2 The presence of Cartoneros affects ideas of CE that shape the market

The emergence of the informal sector had important impacts on the development of new exchange practices for waste management of PET Bottles. Following the crisis 2001, Cartoneros engaged in the exchange practice of collecting of recyclables and developed a nascent market. Re-presentations of such activities done by other actors triggered ideas of value in relation to waste in a period when no one else in the waste management system was engaged in CE exchange practices. Such an effect, although unintentionally generated by UCs, has contributed to re-present PET as a valuable resource. Furthermore, formalizing and legitimizing cartoneros as UCs was a normalizing process that coordinated two controversial practices, meaning the legitimate provision of a public service and the informal work of Cartoneros. Doing so, the CABA government both handled an important and visible social issue and further utilized the good contribution UCs were doing for the waste management of recyclables. Following this process of legitimation, the UCs kept on developing, establishing cooperatives and associating themselves with powerful unions. The combination of contribution to the environment and close association with powerful trade unions, seems to have provided them with high agency to shape the market. For instance, such agency has been used to push for specific interests in the development of current packaging EPR laws that have been discussed by legislators recently (Alcira Argumedo, Carina Quispe).

The emergence of this sector led to the creation of re-presentations of a recycling market that not only seeks CE efficiency, but rather appears to seek social welfare. This led to (2.a) multiple and potentially controversial views of how recycling of PET Bottles in GBA should be handled. From the perspective of legislators closely related to environmental sciences and economics, UCs should have a role. However, they express that the main objective of an EPR policy is to drive CE in the most efficient manner (Carina Quispe). While, from the perspective of legislators who work closely in collaboration with the trade unions of Cartoneros, UCs should be the central actor of the scheme. In other words, emphasizing social inclusion at the expense of efficient circularity. These different views resulted in (2.b) major disagreements in the early legislative process and thus, the lack of coordination slowed down discussions and postponed resolutions (Guillermo Celaya).

Furthermore, we have also identified situations where (3.a) the trade-off between social and economic objectives has been coordinated by addition. Giving Cartoneros a central role in waste management of PET bottles implies using manual labor for processes that could be handled with efficient machines, thus valuing social inclusion above maximizing productivity. Cartoneros are unwilling to lose their jobs, politicians are unwilling to be subject to demonstrations while the recycling industry is unwilling to trade-off productivity. The presence of these multiple agendas also results in controversies, which appear to be partly coordinated by adding both economic and social objectives, but usually privileging the latter thus (3.b) coordinating by addition. The overlap in social and economic objectives also influences exchange practices such as financial subsidies by the government. The government pays a monthly incentive to UCs that are registered in the official cooperatives. However, legislators, producers and social workers seem not to be pleased with what these subsidies re-present. Some argue that the fixed subsidy system does not incentivize efficiency in collection therefore hampering CE efficiency (Carina Quispe; Coca-Cola ; Danone). Others argue that since it is not a real salary it is not acknowledging the labor of UCs as legitimately as a real wage would (CRUO). The negotiation of this opposing re-presentations led to the creation of two simultaneous subsidy programs, one which is fixed and another one which varies with the volume of recyclables collected (Sustentar).

Similarly, in order to increase the low recycling levels, CEAMSE constructed a mechanical separation plant (MBT). However, the need to solve the illegal trespassing to CEAMSE's premises carried out by Cartoneros looking for recyclables changed the direction of the project. From an originally fully mechanical process to one that combines mechanical processes with human labor by setting belts where small waste such as PET bottles can be manually separated. Although arguably reducing some level of efficiency, the mix of human and mechanical separation allows for the creation of formal jobs (CEAMSE). Once again, solving the controversies through coordination by addition.

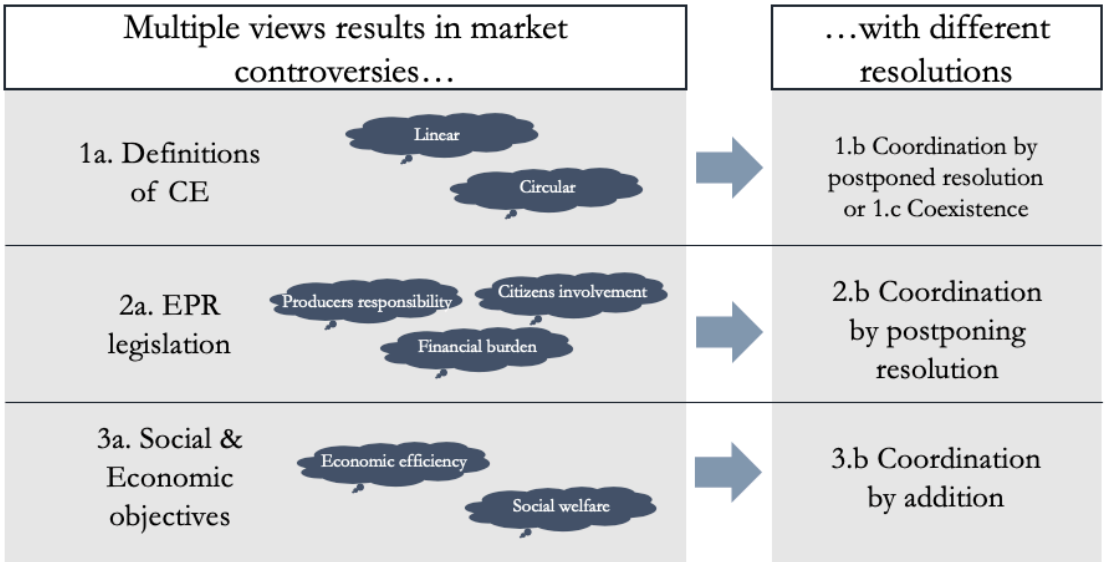


Figure 10: How multiple views result in market controversies that result in resolutions

6.2.3 Concluding remarks

We analyzed how multiple ideas about CE influence the way the market for PET bottles is being shaped. First, we discussed how the current market for PET bottles is characterized by multiple views and definitions of CE that materialize in different market practices and shape the market in different directions. CE is seldom discussed systematically and from a holistic perspective as the theory suggests, but rather related to smaller and independent sustainability practices. Second, we analyzed how the work of UCs has brought value to PET bottles through their engagement in exchange practices connected to collection and recycling. We further discussed how UCs influence the emergence of opposing social and economic objectives that affect actors' understanding of CE while forcing them to balance and coordinate conflicting objectives.

7 Conclusion

The purpose of this thesis is to provide a systematic explanation of how CE is transforming the waste management practices of the market for PET bottles in GBA. Building on a market-as-practice framework, we investigated how the market is being shaped from a practical perspective that focuses on specific activities that are taking place in the market. Simultaneously, this theoretical perspective allowed us to identify *what* ideas of CE are partaking in the shaping of the market, and *how* they are doing so. More specifically, our analysis of the empirical findings shed light to the interplay between exchange, representational and normalizing practices and provided us with a deep understanding of how the waste management practices of the market for PET bottles in GBA is being shaped by CE.

Moreover, the thesis provides a detailed explanation of how CE is developing in a market that really is in the making. GBA appears to be a geography where CE practices have recently started to emerge and as evidently displayed by our findings, we conclude that the transformation is at a very early stage of development.

We found evidence of normalizing practices performed by legislators that seek to establish norms in favor of the circularity of PET bottles. These normalizing practices are based on descriptions of a market that is inefficiently handling resources. Such re-presentations of waste management inefficiencies triggered efforts to develop EPR legislation of which none have yet been approved, as legislators have failed to coordinate the interests of different market actors. Images created through representational practices such as observatories allow for better measurement of environmental externalities as well as for plans to improve the level of circularity of exchange practices in the market. Additionally, our findings also showed that work with normalizing practices is needed in order to better coordinate policies across municipalities to promote CE exchange practices. Furthermore, the research displays that the lack of normative coordination and guidance together with the rising CE relevance has resulted in the emergence of isolated and independent exchange and representational practices. CE relevance seldom arises from what could be considered a pulling consumer demand, but rather from the pushing effect of both internal policies of global beverage producers and external requirements of global organizations (OECD, WB, IADB). We therefore conclude, that although the presence of CE practices is increasing, their application lacks systematization and long-term perspective.

Furthermore, studying how the PET bottles market in GBA is being realized through waste management practices worked as a starting point for discussing how ideas about CE perform the market. We have discussed how multiple understandings of CE theory affected market practices. For instance, incineration has been considered a circular exchange practice by some legislators while the CE theory suggests the opposite. We explore the unique phenomena of UCs, that also put multiple views to the table. While CE theory suggests that circularity should seek for the most efficient way to keep resources in the loop, the presence of UCs has moved emphasis to social inclusion and somehow dislodge the focus from resource circularity. This phenomenon illustrates the interplay of exchange practices both from the formal and the informal market, an aspect that seems to make this setting even more unique.

To conclude, different views on CE are an important characteristic of the transformation from a linear logic to CE. Although a systematic perspective on CE is required to claim the full application of the theory, waste management practices in the market of PET bottles in GBA are starting to head in that direction but are not quite there yet.

8 Contributions and future research

In the following section, we elaborate on (8.1) theoretical and (8.2) practical contributions, while (8.3) stressing the limitations of the findings and (8.4) providing guidance for future research.

8.1 Theoretical contribution

There are several theoretical contributions generated by this paper. Aligning to the initially targeted contributions from section 1.2, the study (1) expands the literature on markets-as-practice by investigating the emergent field of CE. We study a market in the making by focusing our research in a market where CE is still in an early development stage. This allowed us to explore how different ideas about CE shape the waste management system configuration in GBA. We (2) expand the field of research of CE by using a practical approach in a nascent setting. The vast majority of previous research has either tried to depict historical development or tried to devise future projections. As far as we are concerned, this is a novel perspective that allows describing the emergence of CE in a practical manner. Lastly, (3) we stress the theoretical concept of multiplicity and identify how different and often conflicting views of CE shape market practices. This allowed us to explore how different ideas about CE shape the waste management configuration in GBA. We were able to identify the uniqueness of the UCs and evaluate how a social dilemma gets to impact an economic and environmental issue.

8.2 Practical implications

The findings are relevant for a wide range of actors in the investigated market (4). With a system approach the findings shed light on the importance of moving from linear to CE through collaborations among actors and coordination of practices. The uncoordinated views on responsibility hinder the emergence of a circular waste management scheme for PET bottles. Actors should try to achieve circularity by fostering dialogue, joining forces and seeking shared solutions.

Industry-specific, the key to such circularity widely relies on the creation of a regulation that should be based on international best practice but carefully consider the domestic configuration. Not only does regulation define responsibility and direction forward, but also creates long-term viability and a stable foundation for investments. That enables strategic actions and a foundation to establish trust in the system. Our findings display that main local aspects to consider when developing such legislation include UCs and the disparity of capabilities throughout different regions of the country. Considerations about UCs politicize and are therefore beyond the recommendations of this research. However, we must emphasize that it seems evident from the material that actors will have to better coordinate CE efficiency and social welfare. Considerations about the disparity of capabilities should put emphasis on flexibility and enforcement as the legislation must acknowledge the different development phases of different municipalities in the country.

8.3 Limitations

Certain limitations should be considered when evaluating our research. The study captured changes in waste management practices for PET Bottles driven by CE in GBA. While the relevance of the study is very high in that context, our methodological approach hinders the generalization outside the predefined context. We want to emphasize this and stress that investigations of other geographical areas, materials or driving forces might yield different outcomes.

8.4 Future research

We want to highlight four areas in particular where further research could be done. Firstly, the market-as-practice perspective can be utilized further in other contexts because the investigation of how ideas about CE influence market practices has potentially unlimited application areas. Secondly, PET material constitutes only a specific part of the generated domestic waste and definitely not the biggest. Exploring other types of recyclable or non-recyclable waste from a markets-as-practice perspective could shed light on interesting aspects that were beyond our scope. Thirdly, the impact of the UCs highlights an interesting tension between different and competing social and economic objectives. UCs seems to be an Emerging Market phenomenon and thus, visualizing how informal sectors in other settings - such as retail - have adapted to a more formalized setting could display interesting implications for the situation in GBA. Lastly, as the market remains in the making, a replication of the study could consequently yield different outcomes. Visualizing the development in a few years from now would not only provide an updated description of how ideas about CE influence the market but also highlight how some of the barriers and multiple views that we have encountered might have been solved.

9 References

9.1 Academic sources

Allenby, B. R., & Richards, D. J. (Eds.). (1994). The greening of industrial ecosystems. National Academies.

Alvesson, M., & Sköldberg, K. (2009). Reflexive methodology: New vistas for qualitative research (2nd ed.). London: Sage.

Andersson, P., Aspenberg, K., & Kjellberg, H. (2008). The configuration of actors in market practice. Marketing Theory, 8(1), 67-90.

Araujo, L. (2007). Markets, market-making and marketing. *Marketing theory*, *7*(3), 211-226.

Araujo, L., Kjellberg, H., & Spencer, R. (2008). Market practices and forms: introduction to the special issue.

Austin, J. L. (1962). How to do things with words. London: Oxford University Press.

Bell, E., & Bryman, A. (2015). *Business research methods*. Oxford university press.

Bocken, N. M., de Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. Journal of Industrial and Production Engineering, 33(5), 308-320.

Boulding, K. (1966). E., 1966, The economics of the coming spaceship earth. New York.

Braungart, M., McDonough, W., & Bollinger, A. (2007). Cradle-to-cradle design: creating healthy emissions–a strategy for eco-effective product and system design. Journal of cleaner production, 15(13-14), 1337-1348.

Callon, M. (1998). Introduction: the embeddedness of economic markets in economics. *The Sociological Review*, *46*(S1), 1-57.

Chertow, M. R. (2000). Industrial symbiosis: literature and taxonomy. Annual review of energy and the environment, 25(1), 313-337.

Davis, G. G., & Hall, J. A. (2006, May). Circular Economy Legislation: the international experience. In Paper for the Environment and Natural Resources Protection Committee of the National People's Congress.

De Wit, M.; Hoogzaad, J.; Ramkumar, S.; Friedl, H.; Douma, A. (2018). The Circularity Gap Report: An Analysis of the Circular State of the Global Economy; Circle Economy: Amsterdam, The Netherlands.

Denzin, N. K. (1979). The Interactionist Study of Social Organization: A Note On Method. Symbolic Interaction, 2(1), 59-72.

Dubois, A., & Gadde, L. E. (2002). Systematic combining: an abductive approach to case research. *Journal of business research*, *55*(7), 553-560.

Edmondson, A. C., & McManus, S. E. (2007). Methodological fit in management field research. *Academy of management review*, *32*(4), 1246-1264.

Flick, U. (2009). An Introduction to Qualitative Research. SAGE.

Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and evaluating qualitative research. *Australian and New Zealand journal of psychiatry*, *36*(6), 717-732.

Gabriel, Y. (2015). Reflexivity and beyond–a plea for imagination in qualitative research methodology. *Qualitative Research in Organizations and Management: An International Journal*, *10*(4), 332-336.

Geng, Y., & Doberstein, B. (2008). Developing the circular economy in China: Challenges and opportunities for achieving leapfrog development'. The International Journal of Sustainable Development & World Ecology, 15(3), 231-239.

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. Journal of Cleaner production, 114, 11-32.

Giesler, M. (2003) 'Social Systems in Marketing' in D. Turley and S. Brown (eds) European Advances in Consumer Research, Vol. 6, pp. 249–56. Provo: ACR.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. Organizational research methods, 16(1), 15-31.

Gregson, N., Crang, M., Fuller, S., & Holmes, H. (2015). Interrogating the circular economy: the moral economy of resource recovery in the EU. Economy and Society, 44(2), 218-243.

Hawkins, G., & Muecke, S. (Eds.). (2002). Culture and waste: The creation and destruction of value. Rowman & Littlefield Publishers.

Heckman, J. J. (1977). Sample selection bias as a specification error (with an application to the estimation of labor supply functions).

Iacovidou, E., Millward-Hopkins, J., Busch, J., Purnell, P., Velis, C. A., Hahladakis, J. N., ... & Brown, A. (2017). A pathway to circular economy: Developing a conceptual framework for

complex value assessment of resources recovered from waste. Journal of Cleaner Production, 168, 1279-1288.

Kalmykova, Y., Sadagopan, M., Rosado, L. (2018) Circular economy – From review of theories and practices to development of implementation tools Resources, Conservation and Recycling, 135: 190-201

Kendall, M. G., & Buckland, W. R. (1957). A dictionary of statistical terms. A dictionary of statistical terms.

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. Resources, Conservation and Recycling, 127, 221-232.

Kjellberg, H., & Helgesson, C. F. (2006). Multiple versions of markets: Multiplicity and performativity in market practice. Industrial Marketing Management,35(7), 839-855.

Kjellberg, H., & Helgesson, C. F. (2007). On the nature of markets and their practices. Marketing theory, 7(2), 137-162.

Kjellberg, H., & Olson, D. (2017). Joint markets: How adjacent markets influence the formation of regulated markets. Marketing Theory, 17(1), 95-123.

Kjellberg, H., Storbacka, K., Akaka, M., Chandler, J., Finch, J., Lindeman, S., Löbler, H., Mason, K., McColl-Kennedy, J & Nenonen, S. (2012). Market futures/future markets: Research directions in the study of markets. *Marketing theory*, *12*(2), 219-223.

Latour, B. (1984). The powers of association. *The Sociological Review*, *32*, 264-280.

Latour, B. (1987). Science in action: How to follow scientists and engineers through society. Harvard university press.

Latour, B. (1996). On actor-network theory: A few clarifications. *Soziale welt,* 369-381

Laurenti, R., Singh, J., Frostell, B., Sinha, R., & Binder, C. (2018). The Socio-Economic Embeddedness of the Circular Economy: An Integrative Framework. Sustainability,10(7), 2129.

Layton, R. A. (2007). Marketing systems - A core macromarketing concept. Journal of Macromarketing, 27(3), 227-242.

Leontief, W. (1974). Structure of the World Economy. Outline of a Simple Input-Output Formulation. The Swedish Journal of Economics, 76(4), 387-401.

Lin, D., Hanscom, L., Murthy, A., Galli, A., Evans, M., Neill, E., ... & Wackernagel, M. (2018). Ecological Footprint Accounting for Countries: Updates and Results of the National Footprint Accounts, 2012–2018. Resources, 7(3), 58.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75). Sage.

Lindblom, C. E. (2002). The market system: What it is, how it works, and what to make of it. Yale University Press.

Linder, M., & Williander, M. (2017). Circular business model innovation: inherent uncertainties. Business Strategy and the Environment, 26(2), 182-196.

Linder, M., Sarasini, S., & van Loon, P. (2017). A metric for quantifying product-level circularity. Journal of Industrial Ecology, 21(3), 545-558.

Lindhqvist, T. (1992). Extended producer responsibility as a strategy to promote cleaner products. Lund, Department of Industrial Environmental Economics, Lund University, 598967545.

Lindhqvist, T. (2000). Extended producer responsibility in cleaner production: Policy principle to promote environmental improvements of product systems (Vol. 2000, No. 2). IIIEE, Lund University.

Lovins, A., Braungart, M., Stahel, W. A., Birkeland, J., Goerner, S., Spicer, D., & Tuppen, C. (2014). A New Dynamic: effective business in a circular economy. Ellen MacArthur Foundation Publishing, 172.

Lusch, R. F., & Vargo, S. L. (2006). Service-dominant logic: reactions, reflections and refinements. Marketing theory, 6(3), 281-288.

Lusch, R. F., & Vargo, S. L. (2011). Service-dominant logic: a necessary step. European Journal of Marketing, 45(7/8), 1298-1309.

MacArthur, E. (2013). Towards the circular economy. J. Ind. Ecol, 23-44.

MacKenzie, D. (2004). The big, bad wolf and the rational market: portfolio insurance, the 1987 crash and the performativity of economics. Economy and society, 33(3), 303-334.

Masi, D., Kumar, V., Garza-Reyes, J. A., & Godsell, J. (2018). Towards a more circular economy: exploring the awareness, practices, and barriers from a focal firm perspective. Production Planning & Control, 29(6), 539-550.

McDonough, W., & Braungart, M. (2002). Cradle to cradle: Remaking the way we make things.

Nenonen, S., Kjellberg, H., Pels, J., Cheung, L., Lindeman, S., Mele, C., ... & Storbacka, K. (2014). A new perspective on market dynamics: Market plasticity and the stability–fluidity dialectics. Marketing Theory, 14(3), 269-289.

Odendahl, T., & Shaw, A.M., 2002. Interviewing Elites. In Gubrium, J.F., & Holstein, J.A., (Eds) Handbook of Interview Research: Context and Method. Thousand Oaks, California: Sage. pp. 299–31.

Pearce, D. W., & Turner, R. K. (1990). Economics of natural resources and the environment. JHU Press.

Peñaloza, L., & Venkatesh, A. (2006). Further evolving the new dominant logic of marketing: from services to the social construction of markets. *Marketing theory*, *6*(3), 299-316.

Pongrácz, E., & Pohjola, V. J. (2004). Re-defining waste, the concept of ownership and the role of waste management. *Resources, conservation and Recycling*, *40*(2), 141-153.

Ranta, V., Aarikka-Stenroos, L., Ritala, P., & Mäkinen, S. J. (2018). Exploring institutional drivers and barriers of the circular economy: a cross-regional comparison of China, the US, and Europe. Resources, Conservation and Recycling, 135, 70-82.

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. *European journal of social theory*, *5*(2), 243-263.

Reike, D., Vermeulen, W. J., & Witjes, S. (2018). The circular economy: New or Refurbished as CE 3.0? - Exploring Controversies in the Conceptualization of the Circular Economy through a Focus on History and Resource Value Retention Options. Resources, Conservation and Recycling,135, 246-26

Ritzén, S., & Sandström, G. Ö. (2017). Barriers to the Circular Economy–integration of perspectives and domains. Procedia CIRP, 64, 7-12.

Romero - Hernández, O., & Romero, S. (2018). Maximizing the value of waste: From waste management to the circular economy. Thunderbird International Business Review, 60(5), 757-764.

Rubin, H. J., & Rubin, I. S. (2011). Qualitative interviewing: The art of hearing data. Sage.

Stahel, W. (2010). The performance economy. Springer.

Stahel, W. R. (2013). Policy for material efficiency—sustainable taxation as a departure from the throwaway society. Phil. Trans. R. Soc. A, 371(1986), 20110567.

Stahel, W. R., & Reday-Mulvey, G. (1981). Jobs for tomorrow: the potential for substituting manpower for energy. Vantage Press.

Storbacka, K., & Nenonen, S. (2011). Markets as configurations. European Journal of Marketing, 45(1/2), 241-258.

Strauss, A., & Corbin, J. (1994). Grounded theory methodology. Handbook of qualitative research, 17, 273-85.

Taelman, S., Tonini, D., Wandl, A., & Dewulf, J. (2018). A holistic sustainability framework for waste management in European cities: Concept development. Sustainability,10(7), 2184.

Van Buren, N., Demmers, M., van der Heijden, R., & Witlox, F. (2016). Towards a circular economy: The role of Dutch logistics industries and governments. Sustainability,8(7), 647.

Van Griethuysen, P. (2010). Why are we growth-addicted? The hard way towards degrowth in the involutionary western development path. Journal of Cleaner Production, 18(6), 590-595.

Velenturf, A. P., & Jopson, J. S. (2018). Making the business case for resource recovery. Science of the Total Environment, 648, 1031-1041.

Vidal, O., Goffé, B., & Arndt, N. (2013). Metals for a low-carbon society. *Nature Geoscience*, *6*(11), 894.

Waluszewski, A., Harrison, D., & Håkansson, H. (2004). Rethinking marketing: Developing a new understanding of markets. John Wiley and Sons Ltd.

Wijkman, A., & Skånberg, K. (2015). The Circular Economy and Benefits for Society–Swedish Case Study Shows Jobs and Climate as Clear Winners. An interim report by the Club of Rome with support from the MAVA Foundation and the Swedish Association of Recycling Industries.

Yin, R. K. (2013). Validity and generalization in future case study evaluations. *Evaluation*, *19*(3), 321-332.

Yuan, Z., Bi, J., & Moriguichi, Y. (2006). The circular economy: A new development strategy in China. Journal of Industrial Ecology, 10(1-2), 4-8.

Zhijun, F., & Nailing, Y. (2007). Putting a circular economy into practice in China. Sustainability Science, 2(1), 95-101.

9.2 Electronic sources

CAIP (2016) – Apparent consumption of plastic raw materials. Available online: http://caip.org.ar/2015/wp-content/uploads/2017/03/Anuario_CAIP_2016.pdf (accessed on 20 November 2018).

CEAMSE - Centro de Documentación y Biblioteca Ing. Aldo Mennella (2018). Available online at: http://www.bibliotecaceamse.com.ar/ (Accessed 29 November 2018)

Decree 2075/07 (2007). Available online at: http://www.buenosaires.gob.ar/areas/med_ambiente/higiene_urbana/separacion_reciclado.php?menu_id=22655 (Accessed 5 December 2018)

European commission (EC) - Press release - Single-use plastics: New EU rules to reduce marine litter (2018). http://europa.eu/rapid/press-release_IP-18-3927_en.htm (Accessed on 28 November 2018)

European Commission, (EC) - A European Strategy for Plastics in a Circular Economy (2018). Available online: http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf (accessed on 21 November 2018).

European Commission, (EC) - amending Directive 1999/31/EC on the landfill of waste (2018). Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015PC0594 (Accessed on 21 November 2018)

Ellen MacArthur foundation – The new plastic economy, rethinking the future of plastic and catalyzing action (2018). Available online: https://www.ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics-catalysing-action (Accessed on 7 December 2018)

Financial times, (FT) - Argentina takes steps to boost stature on world stage (2017). Available online: https://www.ft.com/content/bcf26210-e0d2-11e7-a8a4-0a1e63a52f9c (Accessed on 22 November 2018)

Fundación Metropolitana – Residuos en GBA (2018). Available online at: http://metropolitana.org.ar/que-hacemos/residuos/ (Accessed 29 November 2018).

Fundación Metropolitana and CEAMSE – Informe digital metropolitano (2017). Available online at: http://metropolitana.org.ar/idm/la-fundacion-metropolitana-organizo-junto-a-ceamse-una-visita-a-norte-iii-con-asesores-de-las-comisiones-de-ambiente-del-congreso-nacional/ (Accessed 29 November 2018).

Global Footprint Network - Report on global economic footprint (2018). Available online: https://www.footprintnetwork.org/our-work/ecological-footprint/ (accessed on 10 November 2018).

Gobierno de la Ciudad de Buenos Aires, (CABA) - Data on "green points" (2017). Available online: https://data.buenosaires.gob.ar/dataset/puntos-verdes (Accessed on 25 November 2018).

Instituto Nacional de Estadisticas y Censo, (INDEC) (2010). Available online at: https://www.indec.gov.ar/nivel4_default.asp?id_tema_1=2&id_tema_2=41&id_tema_3=135 (Accessed 29 November 2018).

Law 1854/05, Zero waste, Buenos Aires, Argentina (2005). Available online: http://www.buenosaires.gob.ar/areas/leg_tecnica/sin/normapop09.php?id=81508&qu=c&cp&rl=1&rf&im&mot_toda&mot_frase&mot_alguna (Accessed on 29 November 2018)

Law 25.916 – Gestion de residuos domiciliarios (2004). Available online at: http://www.icaa.gov.ar/Documentos/Ges_Ambiental/Ley_25.916.pdf (Accessed 29 November 2018)

Law 992/2 – Registro único de recuperadores urbanos (2002). Available online at: http://www.buenosaires.gob.ar/areas/leg_tecnica/sin/normapop09.php?id=31157&qu=c&ft=0&cp&rl=1&rf= (Accessed 29 November 2018)

Minister of Foreign Affairs and Worship, (MRECIC) - Argentina, closer to the OECD (2017). Available online: https://cancilleria.gob.ar/en/news/newsletter/argentina-closer-oecd (accessed on 23 November 2018)

Observatorio Nacional para la Gestión de Residuos Sólidos Urbanos, (ONGIRSU) (2018). Available online: www.observatoriorsu.ambiente.gob.ar (accessed on 20 November 2018).

Observatorio Nacional para la Gestión de Residuos Sólidos Urbanos, (ONGIRSU) - Mapas Críticos Gestion de Residuos Marzo (2016). Available online: http://observatoriorsu.ambiente.gob.ar/146.pdf (accessed on 20 November 2018).

Organisation for Economic Co-operation and Development, (OECD) – Improving markets for Recycled Plastics (2015). Available online at: https://read.oecd-ilibrary.org/environment/improving-markets-for-recycled-plastics_9789264301016-en#page51 (Accessed 29 November 2018)

Organisation for Economic Co-operation and Development, (OECD) - Latin American Economic outlook (2017). Available online: https://www.oecd.org/dev/americas/E-Book_LEO2017.pdf (accessed on 22 November 2018)

Organisation for Economic Co-operation and Development, (OECD) - Extended producer responsibility, policy highlights (2017). Available online:

https://www.oecd.org/environment/waste/Extended-producer-responsibility-Policy-Highlights-2016-web.pdf (Accessed on 23 November 2018)

Reloop Platform, (Reloop) – Deposit system for one-way beverage containers: Global overview (2018). Available online at: https://reloopplatform.eu/wp-content/uploads/2018/05/BOOK-Deposit-Global-27-APR2018.pdf (Accessed 3 December 2018)

TOMRA – Key facts (2018). Available online at: https://www.tomra.com/en/news-and-media/key-facts (Accessed 3 December 2018)

UNCTAD, (UN) - Circular economy (2018). Available online: https://unctad.org/en/Pages/DITC/Trade-and-Environment/Circular-Economy.aspx (Accessed on 21 November 2018)

United Nations, (UN) - Definition of Waste management (1997). Available online at: https://unstats.un.org/unsd/environmentgl/gesform.asp?getitem=1182 (Accessed 29 November 2018)

United Nations, (UN) – Waste management outlook for Latin America and the Caribbean (2018). Available online at: https://wedocs.unep.org/handle/20.500.11822/26448 (Accessed 9 December 2018)

International resource panel, (IRP) – Redefining value, the manufacturing revolution (2018). Available online at: http://www.resourcepanel.org/sites/default/files/documents/document/media/re-defining_value_-_the_manufacturing_revolution_summary_english_web.pdf (Accessed 9 December 2018)

World Bank –What a waste: A global snapshot of solid waste management to 2050 (2018). Available online at: https://openknowledge.worldbank.org/bitstream/handle/10986/30317/9781464813290.pdf?sequence=10&isAllowed=y (Accessed 29 November 2018)

10 Appendices

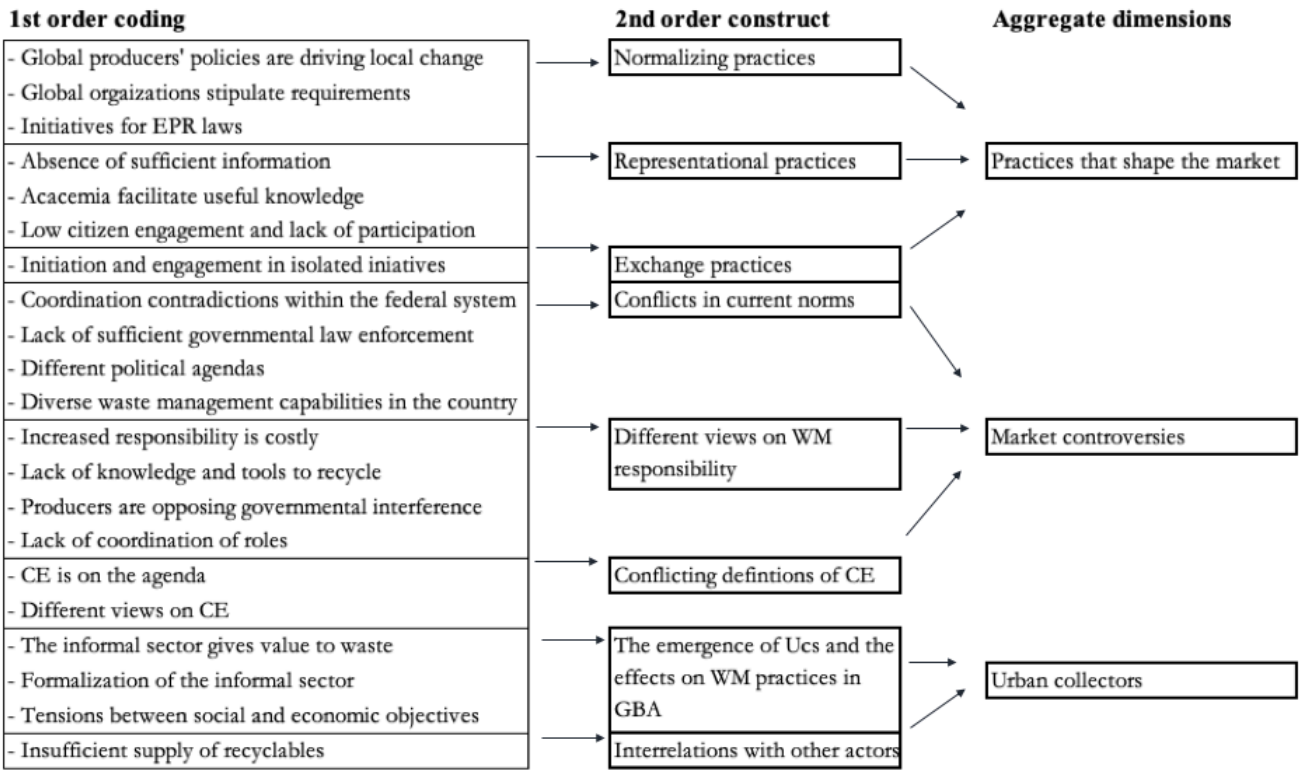
10.1 Interviewees

Name	Organization	Type of organization	Role	Date	Language	Location	Media
Rodrigo Rodriguez Torquinst	Organismo Provincial para el Desarrollo Sostenible (OPDS)	Environmental Agency of Buenos Aires	Director	2018-09-13	Spanish	Stockholm, Sweden	Skype
Fransisco Galtieri	Geofans	NGO	Founder	2018-09-25	English	Stockholm, Sweden	Skype
Pär Bygdeson	Livsmedelshandlarna	Trade association	CEO	2018-09-25	English	Stockholm, Sweden	In person
- Trygve Meyer Jacobsen - Ismir Fazlagic	TOMRA ASA	Collection technology company	Product management	2018-09-27	English	Asker, Norway	In person
Ingrid Solberg	TOMRA ASA	Collection technology company	Managing director Norway	2018-09-27	English	Asker, Norway	In person
Lars Andersen	TOMRA ASA	Collection technology company	Product management	2018-09-27	English	Asker, Norway	In person
- Grethe Meisingset - Joacim Amland	TOMRA ASA	Collection technology company	Business development	2018-09-28	English	Asker, Norway	In person
Harald Henriksen	TOMRA ASA	Collection technology company	EVP and head of BA Collection solutions	2018-09-28	English	Asker, Norway	In person
Dolores Pigretti	Region Skåne	Political institution	Politician. Former EPR scholar	2018-10-01	English	Stockholm, Sweden	Phone
Weine Wiquist	Avfall Sverige	Trade association	CEO	2018-10-02	English	Stockholm, Sweden	Phone
Karin Brynell	Svensk Dagligvaruhandel	Trade association	CEO	2018-10-04	English	Stockholm, Sweden	In person
Thomas Lindqvist	Lund University	Academic institution	Senior Lecturer, EPR expert	2018-10-04	English	Stockholm, Sweden	Phone
Eduardo Mañé	Makro Supermercado Mayorista SA	Supermarket chain	Sales director	2018-10-08	Spanish	BA, Argentina	Phone
Alcira Argumedo	Legislative Power of the Nation	Government	Former National deputy	2018-10-09	Spanish	BA, Argentina	In person
Atilio Savino	Asociación para el Estudio de los Residuos Sólidos (ARS)	Academic institution	President and founder	2018-10-09	English	BA, Argentina	In person
Guillermo Celaya	Legislative Power of the Nation	Government	Former National deputy associate	2018-10-09	Spanish	BA, Argentina	In person
Roberto Candal	Universidad Nacional de San Martin (UNSAM) 3iA	Academic institution	Specialist in chemistry, water & soil contamination and water pollution	2018-10-09	English	BA, Argentina	In person
Soledad Villaverde	Universidad Nacional de San Martin (UNSAM) 3iA	Academic institution	Researcher, circular economy	2018-10-09	English	BA, Argentina	In person
- Agustina Walsh (Sustentar) - Maria Semmartin (UBA) - Pierini Veronica Inés (UBA) - Daniela Regolo (UBA - Emilia Giustiani (UBA) - Marina Omacini (UBA) - Diego Wassner (UBA)	Sustentar & Facultad de Agronomía de la Universidad de Buenos Aires (FAUBA)	NGO & Academic institution	Researches & Academics	2018-10-10	English	BA, Argentina	In person
Gabriel Vanelli	Municipalidad de Vicente Lopez	Municipality	Director of environment and resource efficiency	2018-10-10	English	BA, Argentina	In person
- Carolina Vittorangeli Calle - Carla Perrone - Lucas Ricardi	CEAMSE	Waste management company	Company representatives	2018-10-10	English	BA, Argentina	In person
Carina Quispe	Legislative Power of the Nation	Government	State advisor & Environmental consultant	2018-10-11	Spanish	BA, Argentina	In person
Carlos Willems	Socse	Collection technology distributor	Regional commercial director	2018-10-11	English	Rosario, Argentina	In person
Tamara Artusi	Fundación Metropolitana	NGO	Director of institutional development	2018-10-11	Spanish	BA, Argentina	In person
Juan Pablo Barrale	CCU	Beverage producing company	Manager of corporate affairs	2018-10-26	Spanish	Stockholm, Sweden	Phone
Ana Guerello	Danone Argentina	Beverage producing company	Nature & social innovation project manager	2018-11-01	English	Stockholm, Sweden	Skype
Annelie Niva	Returpack	Collection & sorting company	Head of sustainability	2018-11-12	English	Norrköping, Sweden	In person
Sara Bergendorff	Returpack	Collection & sorting company	Project manager	2018-11-12	English	Norrköping, Sweden	In person
Eduardo Marcelo Catalano	Cooperativa Recuperadores Urbanos del Oeste	Urban collector cooperative	Offical coordinator	2018-11-13	Spanish	Stockholm, Sweden	Phone
Mariale Alvarez	Coca-Cola Argentina	Beverage producing company	Manager of corporate affairs	2018-11-16	English	Stockholm, Sweden	Skype

10.2 Mapping constructs and interviewees

1st order coding	Alcira Argumedo	Guillermo Celaya	Carina Quispe	Gabriel Vanelli	Rodrigo Rodriquez	Atilio Savino	Roberto Candal	Soledad Villaverde	UBA	Juan Pablo Barrale	Ana Guerello	Mariale Alvarez	Eduardo Mañé	Tamara Arnusi	Fransisco Galieri	Ceamse	Carlos Willems	Eduardo Catalano	
	Government					Academia				Producers				NGOs		WM		UCs	
- Global producers' policies are driving local change			x					x	x	x	x	x			x		x		8
- Global orgaizations stipulate requirements			x			x			x		x	x		x					6
- Initiatives for EPR laws	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	17
- Absence of sufficient information	x	x			x	x	x	x	x	x	x		x	x	x	x	x	x	15
- Acacemia facilitate useful knowledge	x	x			x	x	x	x	x			x				x			9
- Low citizen engagement and lack of participation	x	x		x	x		x		x		x	x	x	x	x	x		x	13
- Initiation and engagement in isolated iniatives				x	x		x		x	x	x	x	x	x	x	x	x	x	13
- Coordination contradictions within the federal system	x	x	x			x						x				x		x	7
- Lack of sufficient governmental law enforcement			x	x	x	x			x		x	x			x		x		9
- Different political agendas	x	x	x	x		x			x		x	x		x			x	x	11
- Diverse waste management capabilities in the country	x	x	x				x	x	x		x	x							8
- Increased responsibility is costly			x							x	x	x	x						5
- Lack of knowledge and tools to recycle			x	x	x		x	x	x	x	x	x	x	x	x	x			13
- Producers are opposing governmental interference	x	x	x			x				x		x					x		7
- Lack of coordination of roles	x	x	x	x	x			x	x	x	x	x				x	x	x	13
- CE is on the agenda	x	x	x	x	x	x		x	x	x	x	x	x	x		x			14
- Different views on CE					x	x		x	x		x	x		x	x	x		x	10
- The informal sector gives value to waste			x								x					x	x	x	5
- Formalization of the informal sector		x	x		x	x			x		x				x	x		x	9
- Tensions between social and economic objectives	x	x	x		x	x		x	x	x	x	x		x	x		x	x	14
- Insufficient supply of recyclables			x								x	x					x		4
	11	12	16	8	12	12	6	10	16	10	18	18	7	10	10	12	11	11	

10.3 Data structure



10.4 Interview questionnaire template

Introduction

- Ask for permission to record.
- Brief explanation of the research and our purpose.
- Introduction of participants.

Warm up question

- Are you familiar with the concept of CE?
- What is the relevance of CE and how is your organization working with CE?
- What is relevance of the issues concerning PET-plastic waste management in GBA?

CE

- How are ideas about CE influencing the market?
- Who are the main actors and influencers that shape the market and how are they doing so?
- How are their interests and agendas coordinated?
- How is responsibility distributed?
- Do you see any barriers for CE to drive change in the market?
- What are appropriate initiatives to overcome the barriers?

GBA

- What initiatives are being proposed to improve the recycling of PET bottles?
- What is your view of the current and future role of the informal sector in the waste management configuration?
- What is your view on the current waste management legislation?
- How is consumer behavior changing following this movement?
- What is the role of technology in improving waste management?
- How do you measure and on what basis do you evaluate the performance of recycling systems today?

Outro

- Is there anything of importance connected that you feel that we have left out?
- Can we come back to you if follow up answers should be needed?