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INTERNATIONAL BEST PRACTICES AND LESSONS FOR ADVANCING THE CIRCULAR ECONOMY AGENDA IN CHILE

Ljubljana, September 2024 FRANCISCA VALENTINA FLAJS GONZÁLEZ

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sl. – Slovene
EU – (sl. Evropska unija); European Union
EIB – (sl. Evropska investicijska banka); European Investment Bank
CE – (sl. Krožno Gospodarstvo); Circular Economy
WM – (sl. Ravnanje z odpadki); Waste Management
MSW – (sl. Trdni komunalni odpadki); Municipal Solid Waste
SGDs – (sl. Cilji trajnostnega razvoja); Sustainable Development Goals
WFD – (sl. Okvirna direktiva o odpadkih); Waste Framework Directive
EEC – (sl. Evropska gospodarska skupnost); European Economic Community
IBP – (sl. Najboljše mednarodne prakse); International Best Practices

1 INTRODUCTION

The first industrial revolution established a linear model of resource consumption characterized by the “take-make-waste” pattern. In this framework, which has been upheld until the present day, resources are extracted, transformed into goods to be sold and discarded when it no longer serves its purpose. An approach that largely disregards the environmental consequences associated with the product’s life-cycle (Ellen MacArthur Foundation, 2013; Petrova, 2023).

Circular economy represents a paradigm shift from the traditional linear model of production and consumption (World Economic Forum, 2014) as it is rooted in the principles of designing out waste, keeping products and materials in use, and regenerating natural systems (Ellen MacArthur Foundation, 2013). The concept lies on the idea of restoration and circularity in order to move away from this traditional linear model of economy (Michelini et al., 2017).

In the last couple of years, the concept of the circular economy (CE) has gained significant traction as a viable framework for achieving sustainable development and addressing global environmental challenges (European Commission, 2020). This change is particularly important when it comes to solving global issues like waste management, environmental degradation, and resource depletion (UNDP, 2023). It becomes essential to take note of global best practices in order to push the circular economy goals. This thesis investigates the viability of implementing such practices in Chile, emphasizing waste management tactics in particular. This study looks at Slovenia, a nation known for having excellent waste management systems, as a source of best practices. The goal is to offer insightful analysis and useful suggestions that could improve Chile's efforts to implement a circular economy.

The current global issues on biodiversity loss, deforestation, pollution and waste can be ascribed not solely to individuals engaging in littering and the pervasive impact of the 'throwaway culture,' but also to inadequately designed waste management practices, particularly pronounced in developing countries (Ferronato & Torretta, 2019).

It is not only the recovering of environmental aspects that makes circular economy so attractive but also companies started to observed how the current linear pattern of resource consumption is not only unsustainable, yet, it also implies a higher exposure to risks and higher prices of natural resources (Ellen MacArthur Foundation, 2013). By closing the loop of resource flows and minimizing the extraction of finite resources, the circular economy offers a promising pathway towards decoupling economic growth from environmental degradation (Breaking the connection between "negative environmental impacts" and "economic benefits/growth") (OECD, 2023; European Commission, 2020).

Considering the current unsustainable business practices, the implementation of CE principles is progressively recommended and promoted not only among transnational companies but to achieve goals of sustainable development (Saidani et al., 2019), as enhancing resource efficiency and fostering a transition requires the implementation of ambitious policies and initiatives to unlock their substantial benefits (OECD, 2022).
Several countries are considered advanced in circular economy matters as they have taken part in strategies, developed roadmaps, engaged with several stakeholders, and create significant advances, such as, The Netherlands, Japan, United Kingdom, France and Belgium (OECD, 2020). The scenario for third world countries, like Chile, is nonetheless much different.

Chile, is one of the most prosperous countries in South America (e.g., it has the highest GDP per capita in Latin America), ranks as the top copper producer globally, the second-largest lithium producer, and boasts ample solar and wind resources (IMF, 2024).
However, this economic growth has come at the cost of significant environmental degradation and social consequences. Historically, the country has prioritized the final disposal of waste through sanitary landfills. Until 1990, all municipal solid waste (MSW) produced in Santiago was disposed of in landfills or dumping sites. Policies introduced in the 1990s led to improved landfill regulations and enhanced post-closure monitoring programs, substantially reducing the number of dumpsites. Despite these early on advancements, in 2017, it was estimated that Chile's landfills had only 12 years of remaining useful life (De la Fuente, 2023; MMA, 2022a).

The country had started taking measures to target its most frequent issues, such as, the limited useful life of the country's sanitary landfills, the increasing amount of illegal waste disposals and the soar amount of MSW generated per person, which increased from 294 to 439 kilograms per year, an almost 50% increase within a period of 17 years. These numbers are specially worrying considering that the recycling rate of MSW did not reach 2% (MMA, 2022a). These challenges represent some of the primary issues confronting the country. The circular economy presents a unified goal of simultaneously achieving environmental protection and economic development (EESC, 2019).

Chile presents significant issues in waste management (MMA, 2022a), that were highlighted during the circular economy investigation of this thesis, and to develop a robust circular economy that benefits everyone while respecting the planet's ecological boundaries, we must comprehensively transform our take-make-waste system. This includes improving resource management, product creation and usage, and material disposal (Ellen MacArthur Foundation, n.d.).

Waste does not exist in a circular economy as every product is created with the circularity principles in mind, meaning that it is optimized for a cycle of disassembly and reuse (Den Hollander, Bakker, & Hultink, 2017) Waste, is not only one of the main problematics that

Chile faces, but also the world. Around the globe, a worrying amount of 37% of waste is disposed of in landfills of some sort, 33% is being openly dumped in illegal dumping sites, while only 19% undergoes material recovery (Kaza, Yao, Bhada-Tata, & Van Woerden, 2018).

Waste streams should be considered not as issues to be discarded, as is the case in a linear economy, but rather as valuable resources that can be utilized to create new products, either through the technical manufacturing sector or by returning them to the earth through biodegradation in the biosphere (DLL, 2015).

Countries like Slovenia, The Netherlands, Germany and Austria are some of the leaders in waste management in the world (EEA, 2023), and the improvements are a reflection of some strong EU policies in waste management, including several binding targets to achieve in waste legislation from the period of 2015 to 2030 (European Parliament, 2024). These targets have taken countries like Slovenia almost triple their municipal waste recycling rate in the period from 2004 to 2021 (EEA, 2023).

Slovenia, in particular, has established a strong foundation in waste management, consistently surpassing EU waste management directive targets and emerging as a frontrunner in the zero-waste movement. The closure of numerous landfills due to inadequate health and safety standards, when entering the EU necessitated a significant overhaul of Slovenia's waste management practices. Initially, the country implemented softer measures due to the lack of substantial infrastructure funding available at the time, but it significate a strong and steady foundation on waste management (Sres, 2020).

Countries like Chile can address their current challenges by drawing lessons from circular economy leaders such as Slovenia, which have effectively managed waste-related issues and are actively progressing towards achieving their circular economy objectives.

This thesis begins by examining the present state of waste management efforts, policies, and initiatives in Chile and internationally, aiming to comprehend the national-level landscape. Subsequently, it delves into the case of Slovenia and its exemplary practices, which have led to notable advancements in recycling rates, landfill closures, and the promotion of a zero-waste movement across numerous cities nationwide, as an important resource for learning for Chile.

The research further enhances its understanding through the use of semi-structured interviews with experts, including representatives from government, academia, and non-profit organizations in Chile and Slovenia, focusing on sustainability and waste management. The research questions encompass three main ideas:

1) What is the state of Chile's waste management and its current practices?

2) Is it feasible to transfer international best practices, such as those from Slovenia's waste management initiatives, to Chile's socio-economic and environmental context?
3) What specific policy measures and strategies have proven successful in Slovenia's waste management can be adapted to the socio-economic and environmental context of Chile, and how?

This thesis looks into Slovenia, a pioneer of the circular economy in Europe, to learn from its effective waste management practices how these might be applied in Chile. Through an examination of Slovenia's approaches to waste management, this research seeks to find workable solutions while taking Chile's particular limitations into account. The aim is to provide a thorough framework that tackles Chile's pressing waste management issue and eases the country's shift to a sustainable circular economy.

2 KEY CONCEPTS

Focusing on waste management within the framework of the Circular economy is foundational for advancing the circular economy agenda in different organizational levels. The elimination of waste and pollution is a core principle of the circular economy and represents one of the most pressing challenges for Chile, therefore, this chapter will examine how these principles are inextricably linked and how waste management is essential for advancing the circular economy agenda.

The European Union (EU) emphasized the important role of waste management in their action plan towards a circular economy as it determines how the EU waste hierarchy is put into practice, resulting in high rates of recycling and to valuable materials finding their way back into the economy (European Comission, 2015).

2.1 Overview of circular economy

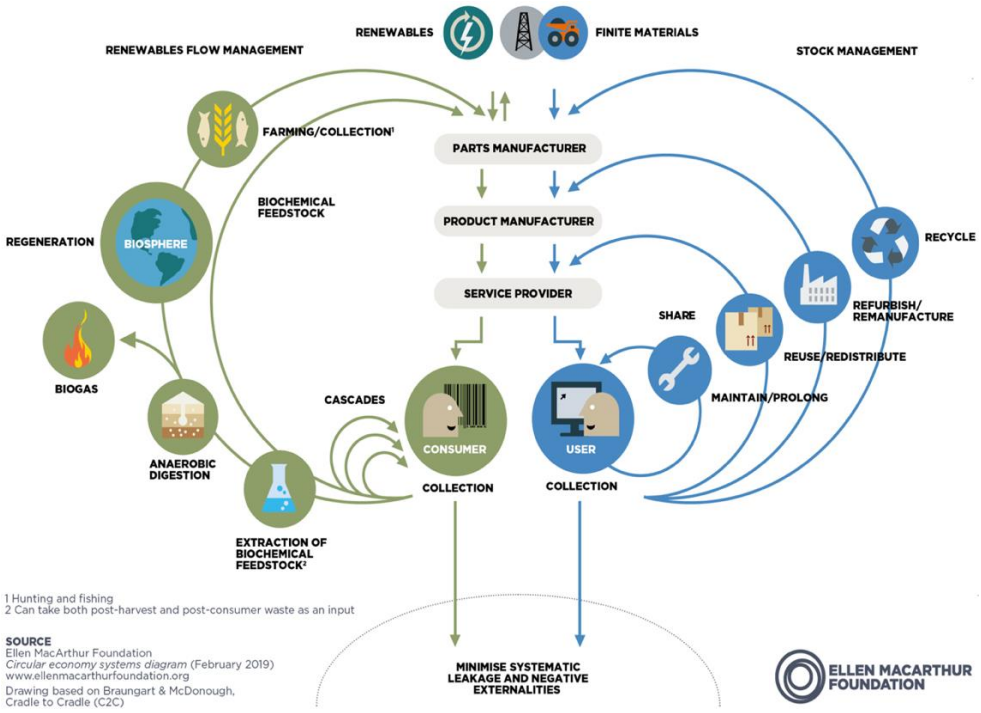
The circular economy's definitions exhibit variation, yet they are predominantly grounded in the 4Rs framework: reducing, reusing, recycling, and recovering materials throughout the stages of production, distribution, and consumption (Kirchherr et. al, 2017). The CE, guided by design principles, aims to eliminate waste and pollution, circulate products and materials at their highest value, and regenerate nature (Ellen MacArthur Foundation, n.d.a).

While the European Union's circular economy policy employs this comprehensive 4Rs framework, it stands in contrast to the more prevalent 3Rs model (reduce, reuse, and recycle), a Japanese initiative adapted in the early 2000s (JWN, 2018) remaining as a world-wide predominant reference point in defining CE and its principles (Kirchherr et al., 2017).

The functions of CE spread across various scales, including the micro level (involving products, companies, and consumers), meso level (in eco-industrial parks), and macro level (encompassing city, region, nation, and beyond) (Kirchherr et al., 2017).
The objective of CE is to extend the life cycle of a product while simultaneously reducing waste to a minimum (Soo, Compston, & Doolan, 2019) therefore, shifting away from the 'end of life' concept (Kirchherr et al., 2017). Ultimately, achieving sustainable development, generating environmental excellence, economic prosperity, and social equity, ultimately benefiting both present and future generations (Kirchherr et al., 2017).

The 4Rs framework is applied in materials throughout the entire lifecycle of production, distribution, and consumption processes (Kirchherr et al, 2017). This implies a circulation or continuous flow of materials in a CE, as shown in Figure 1.
The butterfly diagram showcases two cycles-the technical cycle and the biological cycle. The technical cycle involves the perpetuation of use of products and materials through various procedures like reutilization, repair, remanufacturing, and recycling (Ellen MacArthur Foundation, 2022a). On the other hand, the biological cycle, nutrients derived from biodegradable materials are reintroduced to the Earth's ecosystem, fostering natural regeneration (Ellen MacArthur Foundation, 2022b). The technical cycle of the butterfly system (on the right side) is composed of various stages that allows materials to maintain continuous utilization rather than becoming waste. Its first step (the innermost loop) shows the way in which most value can be captured making good use of the products through sharing, maintenance and reuse, and therefore, should prioritize.

Figure 1: Circular economy system diagram

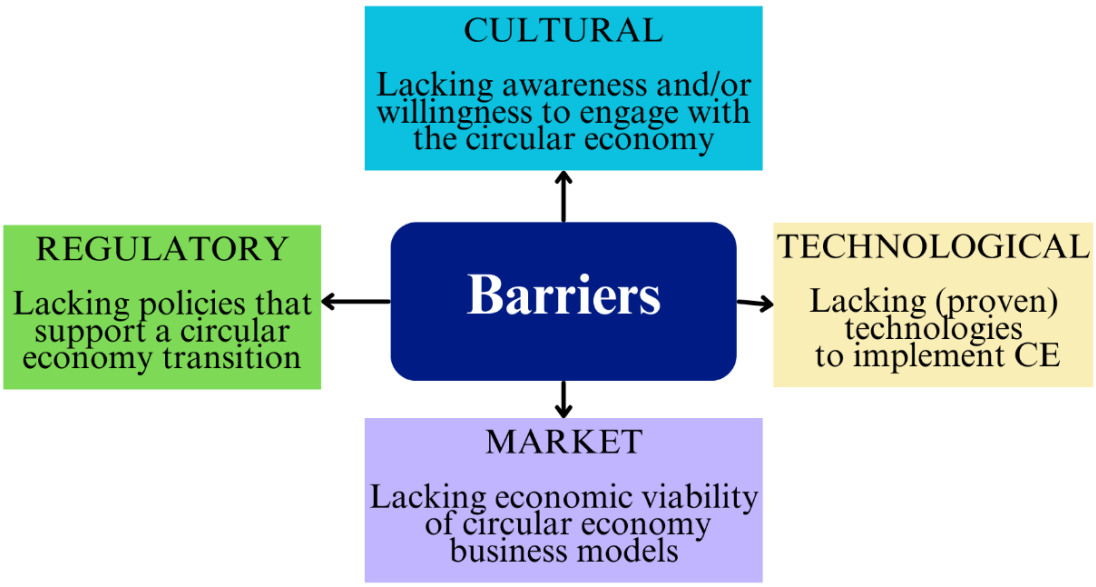


Source: Ellen MacArthur Foundation (n.d.b).

The last stage of this circularity is recycling, in which products must be taken apart to recover its individual raw materials, which are then used to restart the manufacturing process (Ellen MacArthur Foundation, 2022). This is particularly important to grasp because many definitions and applications of the circular economy primarily emphasize on recycling, which is, in practice, the least sustainable of its principles (Ghisellini, Cialani, & Ulgiati, 2016; Bulkeley & Gregson, 2009).

As shown in Figure 2, there are four categories of barriers to advance towards circularity: Cultural, Regulatory, Technological, and Market (Kirchherr et al., 2017). These barriers are interrelated with each other and can result in a chain reaction. For example, a town/city with a culture skeptical of renewable energy will not invest in solar or wind power infrastructure. Consequently, residents remain uninformed about the benefits and possibilities of renewable energy because they haven't been exposed to it. This perpetuates the cultural resistance to renewable energy, creating a cycle where societal beliefs hinder the adoption of sustainable technologies, which in turn reinforces those same beliefs (Kirchherr et al., 2017). According to Kirchherr this could also be translated to consumers lack of awareness or interest to engage with CE in the European Union (Kirchherr et al., 2017).

Figure 2: Categories of circular economy barriers



Source : Adapted from Kirchherr et al. (2017).

Kirchherr et al. (2017) identified that a transition towards a Circular Economy (CE) may be slowed down or even completely derailed by cultural barriers. The most significant aspects of these barriers include "Lacking consumer interest and awareness" and "Hesitant company culture." Interestingly, the least pressing barrier is technological. Specifically, "Lack of

ability to deliver high quality remanufactured products" was the least mentioned by stakeholders as an important issue.

On the other hand, according to Chatham house (2019), policies and their implementation, especially in developing countries, present as a great barrier. Current issues like biodiversity loss, deforestation, pollution, and waste are not solely due to individual actions like littering and the pervasive 'throwaway culture,' but also stem from inadequately designed waste management practices, which are particularly pronounced in developing countries (Ferronato & Torretta, 2019).

Adopting a circular economy requires establishing a well-defined framework and comprehensive set of policies to coordinate actors at various levels effectively. This approach involves creating an integrated array of instruments where cyclical processes intersect. For example, it demands the development of product designs that facilitate recycling and the implementation of business models aimed at minimizing waste. Integrating these elements into a cohesive policy mix presents a significant challenge, highlighting the complexity and necessity of a strategic and coordinated effort (Wilts & Henning, 2017).

According to the European Parliament (2023), the CE approach extends the lifespan of products and aims to minimize waste (aligning with the first principle of CE: eliminating waste and pollution). When a product reaches the end of its usefulness, its materials are recycled and retained within the economy whenever possible. Emphasizing on the importance of this principle. In practical terms, implementing a circular economy involves minimizing waste to the greatest extent possible (European Commission, 2015).

By creating the link between the circular economy and waste management, it becomes clear that a comprehensive and integrated approach that effectively addresses waste management is crucial for addressing current environmental challenges and achieving sustainable waste reduction (Möslinger, Ulpiani, & Vetters, 2023).

2.2 Overview of waste management

Waste management is a challenging endeavour worldwide, holding significant implications for human health, environmental conservation, sustainability, and the promotion of circular economy principles.

Waste classification differs from country to country, but can be broadly classified based on its physical state (solid, liquid, or gaseous), its origin (residential, industrial, agricultural, commercial, etc.), or its environmental repercussions (hazardous or non-hazardous waste) (Amasuomo, Baird, 2016; White et al, 1995). Given the limited scope of this research study, we will not delve into liquid wastes (Those disposed through sewer networks or the potential to leach into groundwater). Similarly, hazardous wastes, as a different type of waste that

requires special treatment, will not be discussed. Our detailed exploration will focus exclusively on municipal solid waste and its management.
While municipal solid waste constitutes merely 10% (approximately) of the overall waste generated in Europe, as indicated by data under the Waste Statistics Regulation (WStatR), its significant political prominence arises from its complex and intricate nature. This complexity stems from its composition, its dispersion across various waste sources, and its association with consumption patterns, making it incredible relevant as an indicator for CE monitoring (Eurostat, 2024).

Waste management (WM) refers to the handling and supervision of waste from its collection, transport, processing and removal stages (InforMEA, n.d), in a manner that reduces potential hazards to human health, wildlife, and environmental systems (Park, 2007). For instance, landfilling of waste, a common practice to manage waste, has the potential to contaminate its surroundings like water and land, posing a health hazard for people living in its vicinity (EEA, 2023). As old as mankind, landfills have been the most used waste management practice globally. Among the MSW treatment and disposal technological options, sanitary landfilling or open dumping is favoured in most countries due to its relatively affordable cost and minimal technical requirements (Vaverková, 2019).

Chile, is the fifth OECD country worldwide with the highest amount of waste sent to landfills in the year 2022, amounting to 417 kilograms per capita. In contrast, countries like Denmark, Germany, Japan, and Sweden generate less than 10 kilograms of waste per capita that is being sent to landfills (Statista, 2022).
WM is one of the biggest challenges many developing and developed countries face. According to Paoletti (2023), effective waste management has the potential to decrease contamination, the spread of diseases, and protect natural resources. Ferronato and Torreta (2019) state that current mismanagement of waste does not allow advances in sustainable development, tightly linked with the Sustainable development goals (SDGs).
According to the World Bank, global annual waste generation is expected to grow 73% from 2.24 billion tonnes in the year 2020 to close to 3.88 billion tonnes by 2025 (World Bank, 2021). In most countries, the overall volume of waste, encompassing all sources, tends to rise together with population and economic expansion (OECD, 2023). On the other hand, limited number of nations, including Hungary, Japan, Lithuania, the Netherlands, and Sweden, have achieved a relative decoupling of total waste generation from economic growth (OECD, 2023).

The question arises as, how can developing countries effectively manage the increasing volume of waste generated while preventing environmental contamination, safeguarding public health, and promoting economic development?

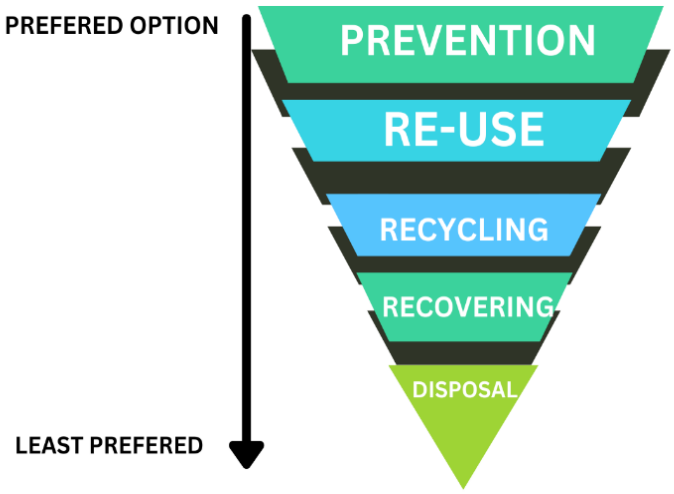
According to Karimi (2023), the necessity for implementing waste management solutions tailored to regional challenges and effective practices is extremely relevant and evident. His

research has shown that it is imperative to promote recycling infrastructure, composting, and waste reduction strategies to attain sustainable waste management that aligns with the SDGs. Developing countries, face several challenges when tackling WM, some of them being, the lack of adequate waste collection systems, the disposal and incineration of waste in open areas, the operation of unregulated or regulated dumpsites, and limited or absent waste recycling or recovery efforts (Godfrey, 2021). The OECD states that waste management policies aimed at promoting greater recycling efforts may contribute to a reduction in environmental repercussions, potentially offsetting the commonly observed positive correlation between economic growth and waste generation in numerous countries (OECD, 2023).

The inquiry emerges regarding which waste management practices possess the capacity to mitigate the rate of waste generation. It is evident that adherence to appropriate waste management policies can advance the circular economy initiative. Consequently, this approach diminishes the proliferation of overabundant landfills, waste incineration, and illicit dumping grounds.

The case of the European Union can be taken into consideration for its early implementation and great advances achieved. The current objectives of waste management directives within the EU are to encourage waste prevention and the implementation of a waste management hierarchy, as shown in Figure 3 (Pires & Martinho, 2019). Figure 3 illustrates the foundation of the EU waste management policy, the Waste Framework Directive (WFD), who was subsequently transposed into the national law of EU Member States, and establishes an order of preference for managing waste from start to end (OECD, 2023). In this hierarchy, waste prevention is prioritized and the 3Rs policies (Reduce, reuse and recycle) are an essential part of this scheme, with disposal of waste being the last resource.

Figure 3: Waste Hierarchy



Source: Adapted from Pires & Martinho (2019).

New and revised policies have been developed and are currently being implemented to promote waste management practices that prioritize the upper tiers of the waste hierarchy. Key initiatives include the European Green Deal and the Waste Framework Directive. In a similar vein, United Nations member countries have acknowledged Solid Waste Management (SWM) as essential for achieving the Sustainable Development Goals. This is reflected in target 5 of SDG 12, which aims to "substantially reduce waste generation through prevention, reduction, recycling, and reuse (3Rs)" (United Nations, 2015).

2.3 Circular economy roadmap

Specific and strong policies, such as those found in EU waste legislation, have demonstrated the most progress in advancing circular practices within the economy. EU waste legislation includes more than 30 binding targets for the period 2015-2030. For instance, the Waste Electrical and Electronic Equipment Directive, the Waste Framework Directive, and the Packaging and Packaging Waste Directive set clear targets and rules for managing e-waste, establish a hierarchy of waste as a guiding principle, and define objectives for packaging design and waste management, respectively. These policies have helped increase the overall recycling rate in Europe, illustrating that robust concrete policies generate significant progress (EEA, 2023).

Moreover, well-designed policies hold the potential to accelerate and broaden the adoption of circular practices within the economy. By supporting businesses in overcoming obstacles, encouraging the development of innovative projects, and fostering long-term investments in circularity, such policies facilitate collaboration and partnerships while delivering tangible outcomes (WBCSD, 2019).

On the other hand, circular economy roadmaps play a crucial role in facilitating this transition. They serve as strategic guides for navigating the shift from a linear to a circular economy and for implementing circular economy principles among stakeholders, governments, and businesses (Siegner & Bhutani, 2023).

As shown in Figure 4, the critical importance of developing a comprehensive global circular economy roadmap is illustrated. Such roadmap can serve as a strategic framework to guide nations in transitioning from linear to circular economic models. The Figure also underscores the significant role that knowledge exchange and international collaboration play in addressing shared challenges. This holistic approach ensures that the benefits of CE practices, are realized on a global scale.

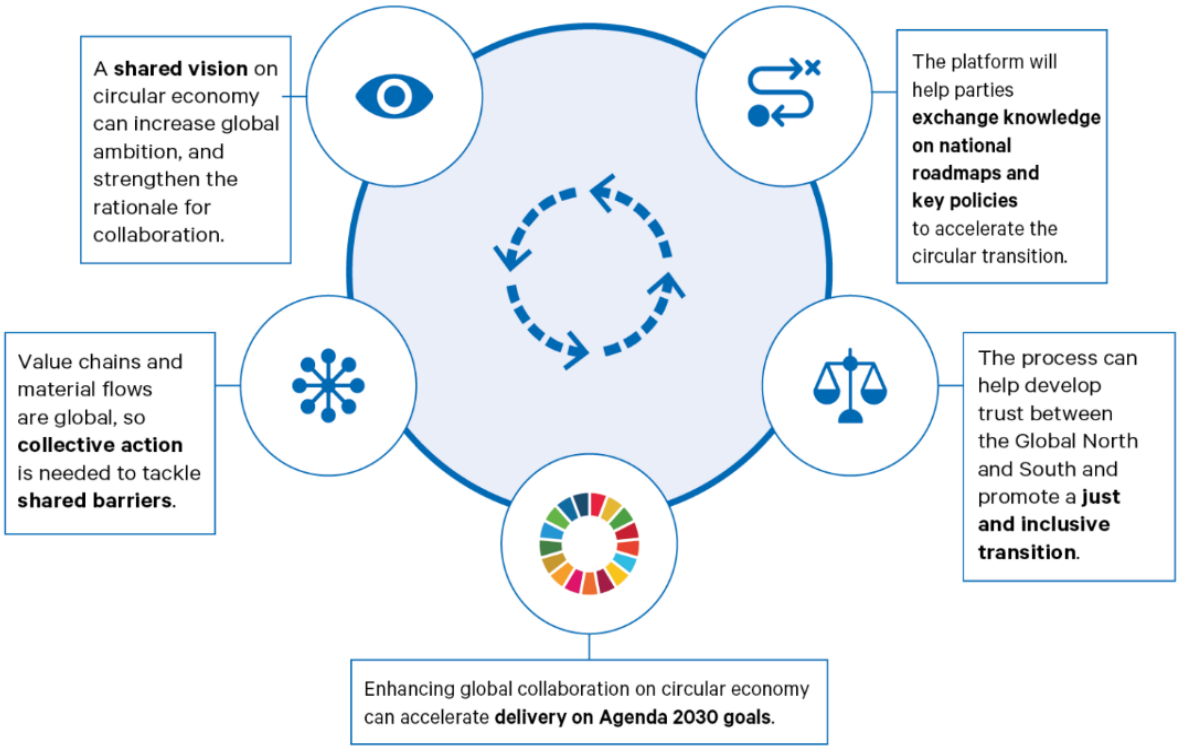
As highlighted by the World Circular Economic Forum (WCEF), these roadmaps provide a systematic approach to enable the transition, incorporating international best practices and promoting global cooperation (WCEF, 2023). The WCEF, which has since 2016 gathered to share leading solutions in CE to policymakers, business leaders, and alike, aims to generate

a competitive advantage and help achieve the United Nations Sustainable Development Goals (SDGs), providing a platform for those leading the road to circularity (WCEF, 2023).

The transition to a circular economy is an extremely complex process, and even though the responsibility is to be shared between all stakeholders, those with leverage to reshape the value chain, can generate the most significative transformation and therefore hold a great responsibility to this transition (Schröder & Barrie, 2022).

One of the earlier CE initiatives was of Japan in the year 2000, called the "Basic Act for Establishing a Sound Material-Cycle Society", when the term circular economy had not been established yet. This initiative contemplated a great combination and proactivity of efforts of the community and society, demonstrating the key role the community plays in such initiatives, as well as the decentralization of circularity, especially in small towns, and creating a society based on recycling (Ministry of the environment, 2024).

Figure 4: Global inclusive circular economy roadmap process



Source: Chatham House (2022).

Best practices to advance the CE agenda could serve as an example of how some nations have tackled different problematics surrounding CE, like waste management, recycling infrastructure, product design and innovation, consumer behavior, etc. In Europe, countries such as Slovenia, the Netherlands, Germany, and Austria are recognized as global leaders in waste management. Their advancements are largely attributable to robust EU policies and ambitious waste management targets. For instance, these policies have enabled Slovenia to

nearly triple its municipal waste recycling rate from 2004 to 2021 (EEA, 2023). This significant progress illustrates the effectiveness of comprehensive regulatory frameworks and the critical role of policy-driven initiatives in enhancing waste management practices across the region.

2.4 Enablers of waste management

The aim of this section is to develop a theoretical background on enablers of waste management. Three main enablers on waste management are identified, Policy and Regulatory Enablers, Sociocultural Enablers and, Infrastructure Enablers. These enablers are key to achieve proper waste management and are also interconnected (Wang, Dong & Yin, 2018).

Policies are part of the toolkit governments have to protect their citizens, and with complex and uncertain issues, like biodiversity loss, deforestation, pollution and waste management, implementing sound policies in the field of natural resource management turns out to be an incredibly important determinant (Pacheco-Vega, 2020).

Several countries have adopted waste management policies at the national level to incentivize the diversion of waste towards higher positions on the waste hierarchy (Martin & Scott, 2003), as well as other value retention options such as refurbishing, repurposing, and remanufacturing. These policies include measures such as the landfill tax, landfill ban, incineration tax, deposit refund scheme (DRS), and policies outlined in the Waste Framework Directive (Malek, Mortazavi, Cialani, and Nordström, 2023).

In 2020, a study revealed stark disparities in countries' participation and compliance with environmental policies. Countries such as Israel, Turkey, USA, Chile, and Cyprus exhibited the lowest levels of participation and compliance, concurrently ranking as primary landfill users. In contrast, nations including Croatia, Denmark, Finland, France, Germany, Japan, Luxembourg, the Netherlands, Norway, Spain, Sweden, and Switzerland demonstrated high rates of participation and compliance. These countries showcased notable progress in waste treatment, transitioning away from prevalent landfill practices. This shift was facilitated by the implementation of higher taxes on landfilling, compelling a transition toward more sustainable waste management practices (Marti & Puertas, 2020). Remarkably, the UK experienced a 70% reduction in landfill use following the introduction of higher taxes (Defra, 2013).

Wang, Dong & Yin (2018) studied the relationship between social behaviour and waste management and identified three main influencing factors: the behaviour of others, legislation and policies, and infrastructure or facilities for waste management.

MORI (2002) illustrated that cultural and socio-demographic variables, including age, affluence, access to a garden, urbanity, ethnicity, and gender, significantly influence

individuals' perceptions of household waste recycling. Furthermore, income level, education, social attitudes, and cultural background profoundly affect perceptions of sustainable initiatives (Papamichael et al., 2023). Additionally, research by Meidiana et al. (2021) identifies that age, occupation, participation in social activities, knowledge of sustainable development, proximity to waste banks, and the 3R dissemination program are critical factors directly associated with community participation in waste management.

The "Roadmap to a Circular Chile 2040" emphasizes that the social and environmental impacts have created a significant gap in the country's waste management system, exacerbating issues such as landfilling, recycling, and waste generation (MMA, 2022a). In this context, socio-demographic factors and public participation are essential for implementing efficient waste management strategies and enhancing public engagement in waste management initiatives (Zorpas, 2020).

The third identified enabler of effective waste management is infrastructure, which includes facilities for waste disposal and recovery such as recycling centres, backfilling operations, incineration plants with energy recovery capabilities, landfill sites and others (SURS, 2018). The implementation of such infrastructure is crucial for waste management systems, significantly impacting both environmental sustainability and social well-being (Thacker et al., 2019). Effective waste management necessitates appropriate infrastructure (SURS, 2018). Research has demonstrated a positive correlation between social behaviour and accessibility to adequate infrastructure, indicating that well-designed facilities can promote responsible waste management practices within communities (Wang, Dong & Yin 2018).

2.5 Importance of IBP and knowledge-sharing

The concept of 'best practice' refers to exemplary methods or approaches acknowledged as effective within a specific context. In policy transfer, this concept serves to streamline the dissemination of successful strategies and information from one setting to another. The underlying principle is rooted in the recognition that while cities and regions are unique, they often encounter similar challenges, thus requiring comparable solutions (Blake, Glaser, Bertolini, & Te Brömmelstroet, 2021).

However, best practices are subject to scrutiny. According to Stead (2012), what proves effective in one context may not universally apply in another due to significant differences in social and economic contexts, as well as institutional frameworks. Similarly, Vettoretto (2009), raised concerns about the de-contextualizing impact of best practices, which tends to overlook the historical and political conditions that contribute to their success.

On the other hand, according to Wilson, Smith, Blakey, and Shaxson (2007), adopting a knowledge- or evidence-based approach to policymaking is beneficial; however, translating this concept into practice has been challenging and continues to evolve.

Ultimately, the adoption of best practices outlines desired policies to follow, sets objectives for planners, and aims to enhance living conditions for citizens, significantly influencing discussions about future planning (Blake et al., 2021); generally, the dissemination of knowledge surpasses that of policy implementation (Stone, 2012). When it comes to knowledge exchange, the OECD (2014), has emphasized the importance of promoting and contributing to knowledge sharing, offering comparative data on policy reforms aimed at enhancing global development.

Particularly, when it comes to development, knowledge sharing plays a crucial role in addressing climate change and sustainability. Owens and Driffill (2008) stress the importance of a systematic approach through interactive cooperation among stakeholders to achieve environmental and economic goals simultaneously. This emphasizes the need for a collaborative effort across disciplines and sectors.

Circular Economy represents a novel thematic approach that is still evolving in many aspects. Consequently, designing strategies for its implementation poses significant challenges. Therefore, analyzing best practices from leading countries, regions, and cities is highly relevant to minimize "trial-and-error" approaches. Identifying best practices can help us gain deeper insight and pinpoint essential elements for success, and to evaluate the potential for tangible outcomes to be achieved (JASPERS, 2022).

In circular economy research, various disciplines contribute to knowledge production, but a select few have predominantly shaped the field. While micro/meso CE approaches show promise, social sciences and economics have seen limited involvement, with psychology and other behavioural sciences notably absent. Consequently, the existing knowledge tends to favour smaller-scale policy-making over larger-scale initiatives. This lack of interdisciplinary connection may impede the development of a unified conceptual policy framework for macro-level CE policymaking (Marra, Mazzocchitti & Sarra, 2018).

This occurs because the implementation of CE initiatives at the micro and meso levels, involves individual firms or production processes. However, at the macro level, it necessitates initiatives involving socio-economic systems across various scales, such as national, regional, or even urban contexts, as seen in the case of "circular cities." This transition from micro/meso to macro levels entails a complete rise in complexity (Su, Heshmati, Geng & Yu, 2013).

To overcome the obstacles related to a transition to a circular economy, and foster the development of a comprehensive policy framework for CE at the macro level, it is essential to encourage greater integration of social sciences, economics, and behavioural sciences in research and policymaking efforts (Marra, Mazzocchitti & Sarra, 2018).

Despite these challenges, international best practices and guidelines on waste management have been widely disseminated, facilitating global knowledge exchange in the waste management field. For instance, the United Nations published a guideline in 2013 providing

direction for developing a waste management strategy, while the United States Environmental Protection Agency (US-EPA) released a guide/toolkit in 2020 aimed at assisting policymakers in developing countries to enhance solid waste management (United Nations, 2013; UE-EPA, 2023).

Wilson et al. (2007) provide an example of how incorporating research results into policy frameworks can improve waste management systems' sustainability and efficiency. They support tighter cooperation between scientists and decision-makers to guarantee that laws are supported by credible data, resulting in better environmental results and more efficient use of available resources. In addition to government officials and legislators, the private sector and civil society should be involved in the creation and execution of policies. Therefore, while talking about research and its applications, the private sector and non-governmental organizations should be involved.

To create comprehensive and effective waste management policies, citizen involvement is essential to bringing policies to life and accomplishing their goals (Izdebska & Knieling, 2020).

Transitioning to a circular economy is a gradual, incremental process that many developed countries have already undertaken. Countries such as Chile could benefit significantly from the experiences of these nations, enabling them to make substantial advancements in overcoming their greater difficulties, like solid waste management systems, within a shorter timeframe.

3 ANALYZING THE CURRENT STATE OF CHILE'S WM

Chile, is one of the most prosperous countries in South America (Highest GDP per capita in Latin America), ranks as the top copper producer globally, the second-largest lithium producer, and boasts ample solar and wind resources (IMF, 2024). With a diverse economy and abundant natural resources, Chile, like many other countries, faces environmental issues such as air and water pollution, waste management, and deforestation (Gómez, 2023).

Moving towards a circular economy offers Chile a promising opportunity to create a synergy between economic growth and environmental protection. This shift allows for the alignment of these two objectives, fostering synergies between them. Material productivity, which measures the economic output compared to the amount of materials used to generate it (MMA, 2022a), is a great indicator of this.

However, Chile has the lowest material productivity among all OECD countries. To put it in perspective, in 2019, the country generated only 0.4 USD for every kilogram of material used. In comparison, the OECD average for that year stood at 2.5 USD per kilogram, while OECD Europe boasted a higher rate at 3.2 USD per kilogram (OECD, 2024).

The potential benefits of enhanced material productivity extend beyond mere cost reduction and productivity enhancements; they could also contribute to job creation across various sectors (MMA, 2022a). The OECD states that attaining green growth requires building a resource-efficient and sustainable economy. This strategy guards against the depletion of natural resources, guarantees sufficient material supplies, and controls the environmental effects of extraction, processing, transportation, use, and disposal (OECD, 2022).

It is emphasized by the OECD that in order to improve resource productivity throughout the whole material life cycle, concrete policies are required. In addition to integrated life-cycle-oriented management strategies like 3R policies (reduce, reuse, recycle), sustainable materials management, and circular economy initiatives, this calls for investments and actions to support technological innovation and change (OECD, 2022).

The country grapples with significant challenges regarding waste and its management, and its social and environmental impacts have become increasingly apparent. These include the limited lifespan of sanitary landfills, the rise in illegal waste disposal, and the notable increase in municipal solid waste production per person. Over a span of 17 years, MSW generation has surged from 294 to 439 kilograms per year, marking an almost 50% increase. Particularly concerning is the low recycling rate of MSW, which remains below 2% as reported by the Ministerio del Medio Ambiente (MMA, 2022a).

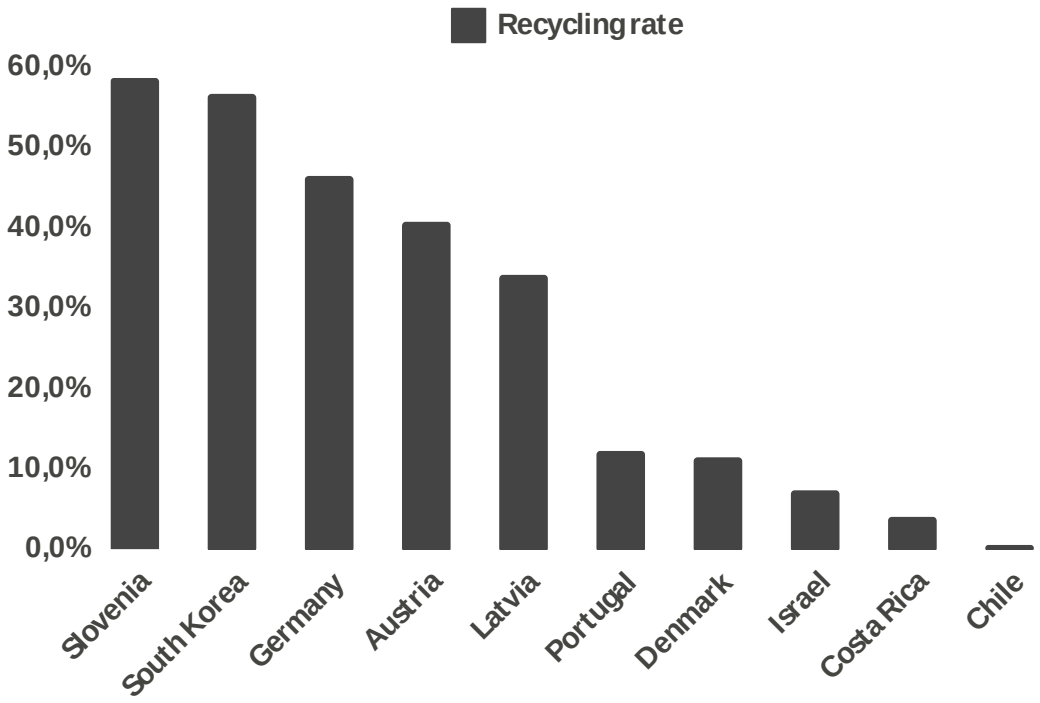
Additionally, the valorization of residuals—reusing, recycling, or composting waste materials to convert them into more useful products—is almost nonexistent. In Chile, organic waste makes up around 58% of the weight of municipal solid waste. However, its recovery and valorization rate are less than 1% of the tons produced annually (País Circular, 2023). Addressing these issues requires urgent action. Embracing the principles of the circular economy offers a shared objective: balancing environmental preservation with economic development.

As shown in Figure 5, the recycling rates of MSW worldwide are illustrated, showcasing the concerning state of waste management in Chile. In the graph, top 5 and bottom 5 countries where showcased, to show the contrast of recycling levels in different parts of the world. Municipal solid waste recycling rates in various countries position Chile at the lowest end, with only 0.4% of its municipal solid waste being recycled. In stark contrast, countries such as Slovenia, South Korea, and Germany exhibit significantly higher recycling rates of 58.5%, 56.5%, and 46.3%, respectively (Statista, 2023).

On one hand, municipalities are legally required to collect and dispose of household waste, a duty they carry out daily. Unfortunately, they face higher costs when recycling compared to simply dumping waste in landfills. On the other hand, for decades, recyclers have been collecting materials like cardboard, glass, and aluminum to sell, mainly for subsistence. Despite this, only a mere 2% of Municipal Solid Waste is recycled, largely due to

municipalities facing higher costs associated with recycling compared to landfill disposal (HCH, 2021; Martínez, 2023).

Figure 5: Municipal solid waste recycling rates worldwide 2021.



Source: Adapted from Statista (2023).

The country's final disposal poses as one of the biggest problematics the country faces, and according to a study conducted in 2017, the remaining useful life of sanitary landfills was 12 years, meaning that by 2029 the country will have no landfill left to dispose of waste, a specially worrying situation, considering opening a new landfill is a process that could take many years to materialize (MMA, 2022a).

Additionally, the situation of illegal landfills, a common practice in South American countries, in which waste is discarded in public and private areas, often times contaminating the environment and posing as a tremendous health threat to the most vulnerable population living in its surroundings, is often times seen throughout Chilean territory, as of 2017 there were 3,735 of these illegal dumping sites, were approximately 90% of them have a surface of less than 1 hectare (MMA, 2022a).

Chile produced 20 million tons of waste in total in 2019, with 7,860,784 tons coming from municipal sources. This comes to an average of 1.13 kilograms per person per day with just above 19 million residents. This waste is divided between the 128 active sites—30 sanitary landfills, 8 traditional landfills, 52 dumpsites, 38 garbage dumps, and other sites—are used for the final disposal (BCN, 2022). Of the total municipal waste, 45% is generated in the Metropolitan Region, where 41.1% of the country's population is concentrated (UChile, 2021).

Continuing with the need for collective efforts to manage waste, in an interview with the University of Chile, the academic and social anthropologist María Elena Acuña emphasized that all human activities inevitably generate waste. The issue is that this waste ends up in landfills or open dumps in rural areas, causing land and water contamination and bad odors that harm communities, product of inapropiate waste management practices. She further emphasizes that the root problem is the promotion of a wasteful and consumerist culture, combined with insufficient community and municipal involvement in waste management. Additionally, there is a lack of recycling infrastructure and capacity, and ineffective enforcement of laws like the Extended Producer Responsibility Law (REP) in Chile (UChile, 2021).

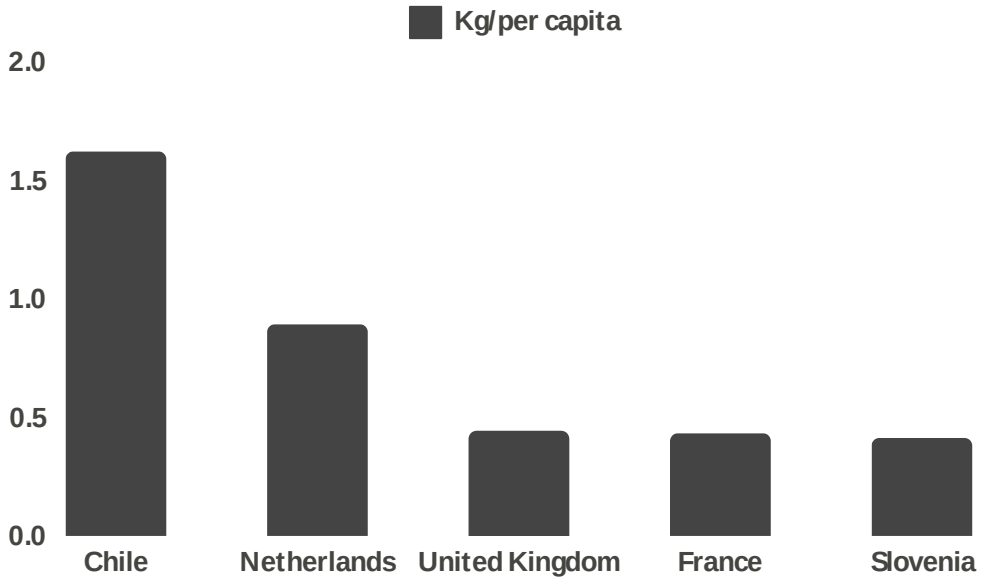
Plastic is one of the major inorganic solid waste fractions in our daily municipal solid waste (MSW) production. Because of its widespread use and inability to biodegrade, plastic has a significant negative environmental impact, which is the main problem when it comes to solid waste management. A large amount of municipal solid waste is made up of plastic waste, which seriously pollutes the air, sea, and soil. Rapid urbanization, the expansion of industry, and a consumerist culture are important contributing factors to the negative scenario. The issue is made worse by the inadequate collection and sorting of plastic waste, most particularly in developing nations (Kibria et al., 2023).

As shown in Figure 6, "Mismanaged plastic waste per capita, 2019", refers to waste that is not recycled, incinerated, or kept in sealed landfills. It includes materials burned in open pits, dumped into seas or open waters, or disposed of in unsanitary landfills and dumpsites, commonly but illegal practices.

The graph highlights a notable contrast in plastic waste management practices among different countries. Chile stands out with a relatively high mismanaged plastic waste generation per capita, reporting 1.62 kg compared to significantly lower Figures in nations like the Netherlands (0.89 kg), the UK (0.44 kg), France (0.43 kg), and Slovenia (0.41 kg) (Meijer et al., 2021). This data underscores the urgency for Chile to address its plastic waste management challenges, waste of which mostly ends up being discarded of in some of the thousands illegal waste disposal sites that are in the country (Ossio & Faúndez, 2021).

As it will be discussed in the following section, the Chilean government has undertaken significant legislative measures to address the plastic issue, among others. The most important of these is the Extended Producer Responsibility (REP) law, this law published in 2015, and focused on companies, forbids the giving out of free plastic bags in retail establishments. Another crucial step in this effort is an additional recent law that forbids hotels, restaurants, and other similar establishments from giving out free single-use plastics, but it is unfortunaly yet to be enforced everywhere (MMA, 2022).

Figure 6: Mismanaged plastic waste per capita, 2019



Source : Adapted from Meijer et al. (2021).

Despite the rather negative environment in Chile's waste management, the country is also internationally committed to tackling climate change by actively engaging in international mitigation, adaptation, and environmental preservation through partnerships, collaborations and initiatives. This commitment is evidenced by its adoption of the 2030 Sustainable Development Agenda in 2015, ratification of the Paris Agreement in 2017, and its current leadership role in the Conference of Parties (COP25), reflecting a steadfast dedication to these goals (Ministerio de Hacienda, n.d).

3.1 Examination of existing waste management practices in Chile

Chile has established ambitious objectives aimed at achieving a sustainable and circular transformation. These objectives focus on addressing key challenges such as increasing the recycling of municipal solid waste, promoting solutions at the highest levels of the waste hierarchy, enhancing infrastructure, reducing waste generation, creating green jobs, and rehabilitating illegal landfill sites, among others (MMA, 2022a). The main strategies identified are: The Roadmap for Circular Chile by 2040, The Plastic Pact and The Extended Producer Responsibility (EPR) law.

As shown in table 1, it is illustrated the main steps Chile has taken towards a more sustainable and circular economy, with particular emphasis on waste management in both the EPR law and the Roadmap for a circular Chile by 2040. All these initiatives, policies and pacts refer to steps Chile has taken to personalize guidelines specifically for Chile's situation.

Table 1: Practices, policies and regulations in Chile

Main strategies & policies	Main objectives	Published
Extended Producer Responsibility Law (Law No. 20,920)	· Reduce the generation of waste and promote its reuse, recycling and other types of recovery, increasing overall valorization of materials through the establishment of EPR. · It also prohibits giving free plastic bags in retail commerce and giving free single-use plastics in hotels, restaurants, food court and similar establishments.	2015
The Circular Economy office (Former waste office)	· Exercise technical coordination in the implementation of policies, programs, plans and standards regarding: Reduction and control of waste generation, including its recovery, sustainable production and consumption.	2018
Roadmap for a circular Chile by 2040	· Its 7 goals: Creation of green jobs, decrease in the generation of municipal solid waste per inhabitant, decrease in total waste generation per GDP, material productivity, increase the overall recycling rate.	2019
National organic waste strategy Chile 2040	· To significantly increase the recovery rate of organic waste managed at the municipal level (by the Municipalities, generated at the household level, in street markets, parks and gardens, the hotel sector, restaurants, cafeterias, and small businesses). · Establishing the goal of going from a household organic recycling rate of 1% to 66% in 2040.	2021
Plastic Pact	· Eliminate plastic packaging and products unnecessary and problematic single use through redesign, innovation or alternative delivery models. · Ensure that all plastic packaging is reusable, recyclable or compostable. · Significantly increase reuse, collection and recycling of plastic containers. · Increase recycled content in plastic packaging to boost demand for recycled material.	2020

Source: Own work.

3.1.1 Extended Producer Responsibility Law

The Extended Producer Responsibility Law "EPR" (Law No. 20,920) serves as a comprehensive framework for waste management, producer responsibility, and the promotion of recycling. It focuses on the principles of the 3R's (Reduce, Reuse, Recycle), emphasizing producer responsibility by mandating responsibility for manufacturers and importers of five key products: lubricating oils, electrical and electronic devices, containers and packaging, tires, and batteries. The law establishes a Recycling Fund as a support mechanism for EPR, enabling the funding of projects, programs, and actions developed by

municipalities and associations of municipalities to prevent waste generation and promote its reuse, recycling, and other forms of valorisation. The law includes the adaptation of other norms to facilitate the operation of the EPR system, defines specific obligations for different actors related to waste management, and implements a regime of monitoring and sanctions (MMA, 2020).

Under this law, producers of certain materials are required to ensure a specified percentage of valorisation for these materials, in line with yearly targets. They are also tasked with organizing and financing waste management for their products. Furthermore, the law incorporates principles such as "the polluter pays" and gives power to the Environmental Superintendent to oversee compliance with these objectives (MMA, 2022a). The EPR law exists since 2016, and has been progressively introduced into the Chilean market, coming into full action by the end of 2023 (Transforma alimentos, n.d).

Other two laws are contained in this law. Law No. 21.100, also referred to as the "Plastic Bag Ban Law," forbids the distribution of plastic bags in retail establishments in Chile. This law, which went into effect on 2018, forbids single-use plastic bags from being given out at any retail location nationwide (BCN, 2018). Law No. 21.368 of Chile forbids the free distribution of single-use plastics and plastic bottles in lodging facilities, restaurants, and other similar establishments. The law was passed in 2021 and aims to decrease waste generation (BCN, 2021).

3.1.2 The Circular Economy office

The Circular Economy office has been actively involved in developing the Roadmap for achieving a circular economy in Chile by 2040. This involves ensuring the effective enforcement of regulations under the EPR law. Additionally, it oversees the recycling fund established by the EPR law, which distributes funds to various municipalities to encourage circular economy projects. Furthermore, the department coordinates and executes various initiatives aimed at reducing plastic usage, managing waste from construction materials, and other similar efforts (MMA, n.d).

3.1.3 Roadmap for a Circular Chile by 2040

The Roadmap for a Circular Chile by 2040 is an ambitious roadmap toward circularity, it establishes mid-goals until 2030 and also, objectives to be achieved by 2040. The roadmap contains 7 main goals: Creation of green jobs, decrease in the generation of municipal solid waste per inhabitant, decrease in total waste generation per GDP, increase of material productivity and to increase the overall recycling rate. With the collaboration of international bodies like the Ellen McArthur foundation, the European commission, the World Economic forum, the French Ministry of the Ecological and Solidarity Transition, the Dutch Ministry of Infrastructure and Water Management, among many others, helped with the creation of

an ambitious guide that tackles local challenges, while encouraging a global transition (MMA, 2022a).

3.1.4 National Organic Waste Strategy Chile 2040

The National Organic Waste Strategy Chile 2040 provides a framework of goals and targets to be achieved by 2030, including the valorization of 30% of organic waste generated at the municipal level and engaging 500,000 families in using composters and/or vermicomposters in their homes. By 2040, the strategy aims to achieve a household organic recycling rate of 66%, a significant increase from the current rate of 1% (Chile sin basura, 2021). Organic waste constitutes a significant fraction of municipal solid waste, accounting for 55% in Europe and 58% in Chile. Given its substantial proportion, effective management of organic waste (or bio-waste) is crucial when developing and implementing comprehensive waste management strategies, therefore addressing this component can lead to significant improvements (Bidlingmaier et al., 2004; MMA, 2022b).

3.1.5 The plastic pact

Chile became the third country globally to join the Plastic Pact, early in 2019, following the United Kingdom and France. It also holds the distinction of being the first Latin American nation to participate in this global initiative. The pact focuses on addressing the challenges posed by the linear nature of the plastic industry, particularly in packaging and containers. Currently, only 5% of plastic materials are valorised after their initial use in Chile. The aim of the Plastic Pact is to encourage innovation and collaboration to develop new methods for manufacturing, utilizing, reusing, and recycling plastics (Pacto Chileno de los plásticos, 2020).

4 INTERNATIONAL BEST PRACTICES: WASTE MANAGEMENT

The need for an effective waste management system comes with an increase in waste generation that threatens human health, the environment and people's livelihood (EPA, 2020). One major principle remains true: the best course of action is to avoid creating waste in the first place (UNEP & ISWA, 2024). However, low- and high-income countries generate and manage waste differently (Medina,2010). Generally, high-income countries generate larger amounts of packaging waste, while low- and middle-income countries have larger amounts of organic or food waste (Kaza et al., 2018).

High- and upper-middle-income nations are nearly the only ones with adequate waste disposal or treatment systems, such as regulated landfills or more strictly run facilities (Medina, 2010; Kaza et al., 2018). Open dumping and burning is typically the norm in lower-income nations (Ferronato & Torretta, 2019). Gaining an understanding of these global best practices serves as a basis for investigating particular developments and programs, to build a sustainable future.

This section examines international best practices and innovative strategies implemented in Slovenia, presenting it as a compelling case study that highlights significant advancements in waste management in alignment with EU directives and initiatives aimed at promoting a sustainable future. By analysing key milestones, the country has achieved, the aim is to gain insights into effective waste management approaches that promote sustainability, circularity and specifically, advance the waste management agenda in order to gain deeper insights into crucial success factors, and, to evaluate the practical outcomes achieved, to be potentially applied to Chile's context.

The EU has developed a set of circular economy indicators to systematically monitor and evaluate progress towards achieving a circular economy. The indicators are divided into 5 categories: Production and consumption, Waste management, Secondary raw materials, Competitiveness and innovation & Global sustainability and resilience (Eurostat, n.d). Within the Waste Management category, there are four indicators (Eurostat, n.d):

1) Recycling rate of municipal waste
2) Recycling rate of all waste excluding major mineral waste
3) Recycling rate of packaging waste by type of packaging
4) Recycling rate of waste of electrical and electronic equipment.

In this research focused on MSW, it has been identified four pivotal indicators: Recycling rate of municipal waste, Recycling rate of all waste excluding major mineral waste, landfill rate of waste (although it's not one of the four main indicators), and Generation of waste excluding major mineral wastes per GDP unit (categorized under 'production and consumption'). These carefully chosen metrics form the backbone of our quantitative analysis, allowing us to delve into Slovenia's efforts towards enhanced waste management practices. By examining these indicators, we aim to gain deeper insights into Slovenia's progress in fostering sustainability and circularity within its waste management framework. Through this examination, we can gauge the effectiveness of Slovenia's strategies, providing valuable feedback and guidance for future endeavours aimed at promoting a more environmentally conscious approach to waste management in Chile.

The EU has long been at the forefront of advancing circular economy principles and waste management practices, drawing upon a rich history of trial and error, iterative policy refinement, and proactive experimentation. This longstanding commitment has positioned

the EU as a global leader in sustainability initiatives, distinguishing it from other regions around the world (Santosh G, 2024). Its early advancements date back from 1975, aiming to standardize waste disposal laws across EEC (European Economic Community) member states. It prioritizes protecting human health and the environment while encouraging waste recovery and recycling. Competent authorities were tasked with planning and supervising waste disposal operations, and the "polluter pays" principle applies to cover disposal costs. Member states were asked to report on waste disposal regularly and align their laws with the directive within a specified timeframe (European Union, n.d.).

Europe has been a leading region in terms of circularity and waste management, with over 30 binding agreements. Different proactive waste policies and legislations have been put into place, with the most relevant being:

1) The Packaging and Packaging Waste Directive (1994), which sets targets for recycling packaging waste.

2) The Waste Electrical and Electronic Equipment Directive (2003), which focuses on the management of electrical and electronic waste.

3) The Waste Framework Directive (2008), which sets targets for the valorisation of municipal waste.

Even before it joined the EU, Slovenia started down the path toward effective waste management techniques. Slovenia adopted strategic guidelines on waste management as early as 1996, taking cues from the EU's 1989 waste management strategy. The nation then put into effect the Rules on Waste Management in 1998, which established an administrative framework controlling waste management procedures. In addition to classifying waste types, outlining reporting requirements, outlining obligations and prohibitions regarding waste mixing, and providing detailed methods for waste disposal, these rules also outlined the responsibilities of various waste management participants.

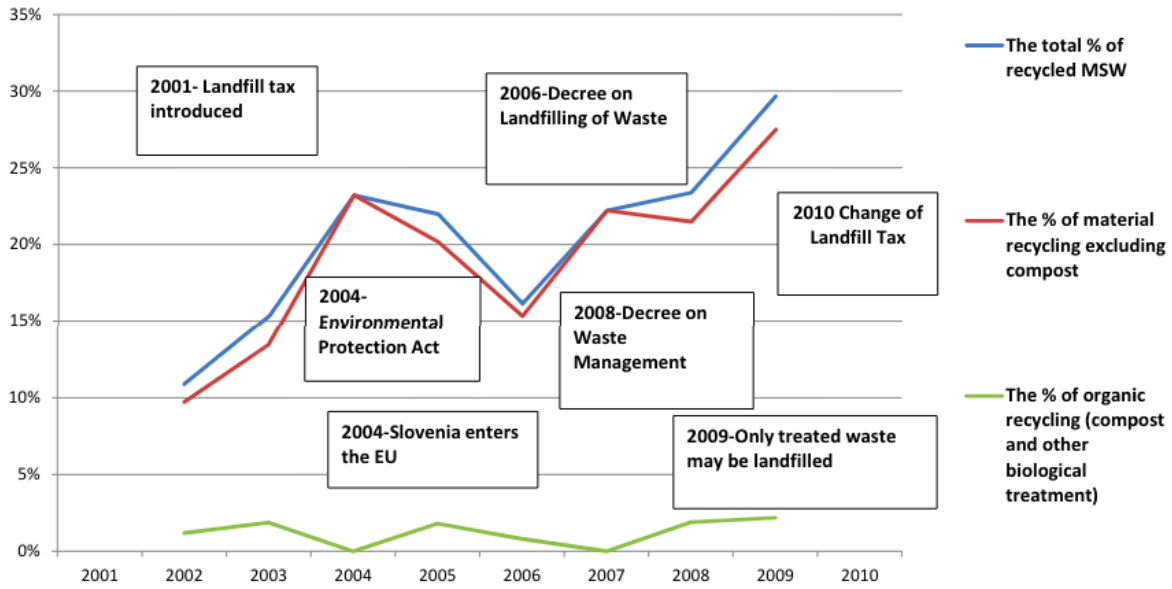
By enacting the Rules on Waste Disposal in 2000, Slovenia maintained its commitment to waste management and built on these initial steps. This policy document set standards for proper waste removal, especially for landfill service providers, which was a major turning point. Slovenia established the foundation for efficient waste management procedures, guaranteeing adherence to EU directives and fostering environmental sustainability, through these policies and guidelines (Keuc, 2002).

Slovenia’s dedication to sustainability and specifically to the way it manages its waste persisted over time and experienced a period of great improvements, showcasing its steadfast commitment. Shown in Figure 7, it can be seen the development of recycling of MSW in Slovenia in terms of total recycling, material recycling and organic recycling (compost and

other biological treatment), together with important initiatives the country had taken towards the improvement of MSW.

This transformation is evidenced by pivotal milestones, such as the introduction of the Landfill tax in 2001, followed by the alignment with EU standards through the adaptation of the Environmental Protection Act in 2004, with the country's accession to the EU. The most relevant acts related to waste management in Slovenia, are the Environmental Protection Act (adopted in 2004), the Decree on the Landfilling of Waste (adopted in 2006), and the Decree on Waste (adopted in 2011) (EEA, 2013). Figure 7, illustrates how the implementation of these initiatives has greatly impacted Slovenia's recycling rate throughout the years.

Figure 7: Recycling of MSW in Slovenia and important policy initiatives



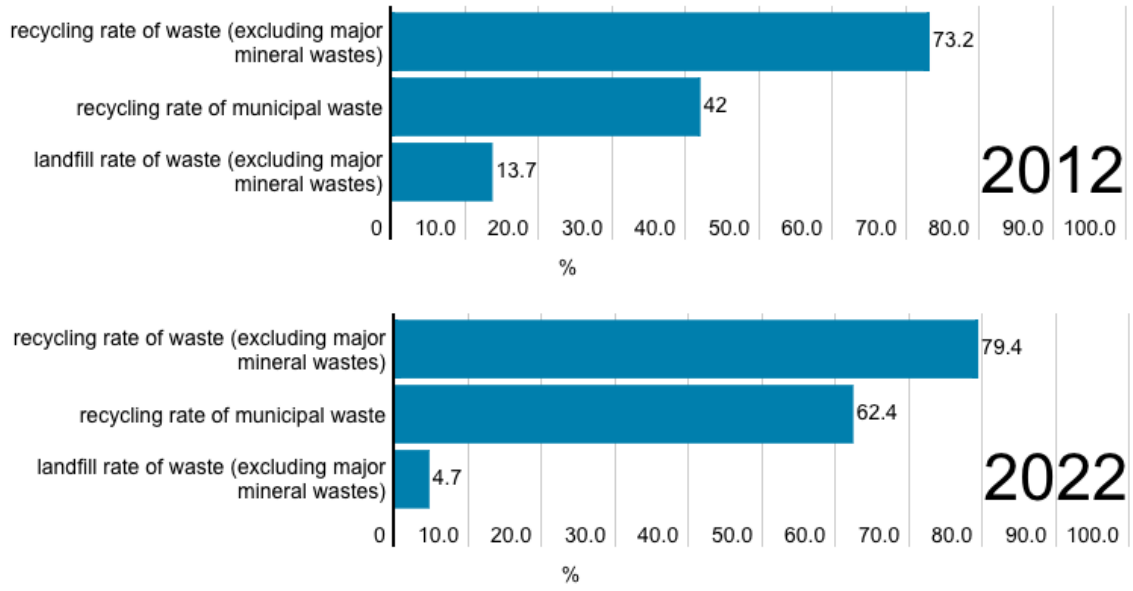
Source: EEA (2013).

Fast-forward to 2018, Slovenia implemented the Roadmap towards the circular economy. This pivotal initiative has subsequently influenced various facets of national policy, with waste management emerging as a focal point. Notably, Slovenia's proactive stance finds resonance among its European Union counterparts, with 16 member states similarly prioritizing waste management within the broader framework of circular economy integration (EEA, 2022). Slovenia's leadership in this arena predates these collective endeavours; as early as 2014, the nation had achieved compliance with pertinent targets outlined in the Waste Framework Directive and had promulgated approximately 50 legislative acts at the national level, encompassing diverse facets of waste management (European Commission, 2015).

As shown in Figure 8, one of the main indicators, the recycling rate of all waste (excluding major mineral wastes) was slightly more than 79% in 2022. This is 6 percentage points less than in the previous year and 6 percentage points more than in 2012, the recycling rate of municipal waste reached a 79,4% in the same year, showing a consistent increase since 2012

(SURS, 2023). EU waste policy generally aims to reduce the amount of waste disposed of in landfills, in line with the waste hierarchy, in order to overall prevent its generation. Slovenia, along with other countries, has made significant progress in decreasing its dependence on landfills (EEA, 2024). The landfill rate for treated waste has also decreased significantly, and the question raises as how has been Slovenia able to increase the amount of waste being recycled and decreasing the amount of waste being sent to landfills in such short period of time.

Figure 8: Waste recycling and disposal rates in Slovenia

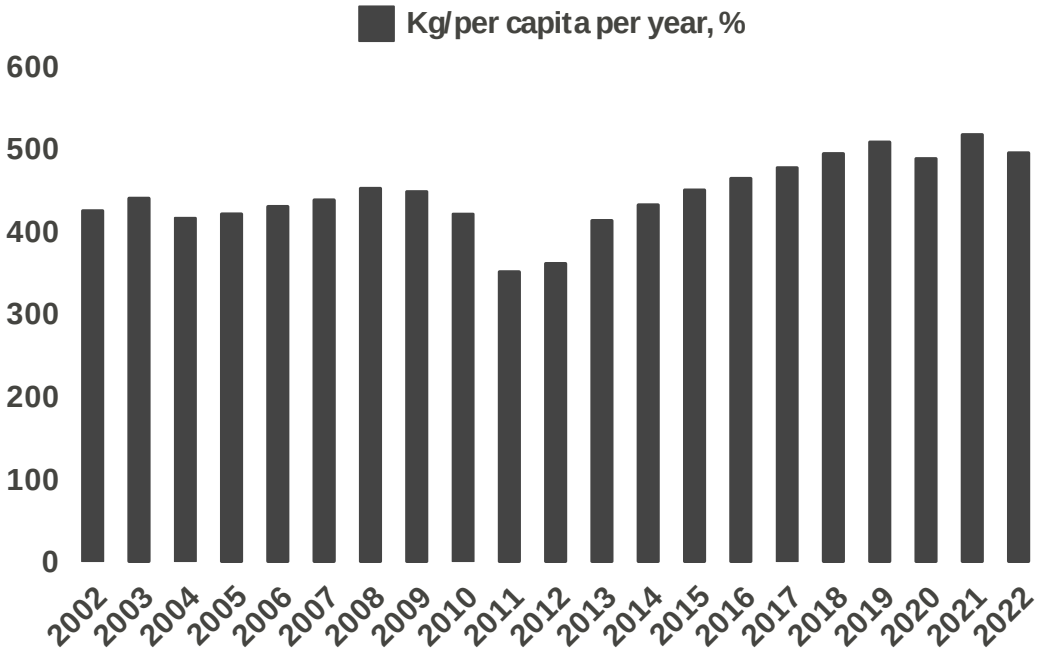


Source: SURS (2023).

Various factors contribute to waste production, including some less quantifiable ones like educational level (Trang et al., 2017), the implementation of waste prevention initiatives (EEA, 2018), and national or regional laws such as the substantial landfill tax in the United Kingdom (Davies & Doble, 2004). Nonetheless, socioeconomic factors have proven to have the biggest influence on solid waste generation. Namlis and Komilis (2019) assert that indicators like GDP (Gross domestic product) and HDI (Human development Index) play significant roles in waste generation, underscoring the importance of considering this relationship when crafting waste reduction policies.

As highlighted in chapter 1.2, minimizing waste generation is identified as the foremost priority within the Waste Hierarchy, as outlined in the Waste Framework Directive (Article 4). It is the primary action that could ultimately lead to the separation or decoupling of economic growth from waste generation (Mazzanti et al., 2012; Gellynck et al., 2011). Moreover, waste prevention is closely linked to advancements in manufacturing methods and shaping consumer demand for eco-friendly products with minimal packaging (Sumrin et al., 2021).

Figure 9: Municipal waste generated [Kg/capita].



Source: Adapted from SURS (2024).

As shown in Figure 9, the generation of municipal waste per capita in Slovenia is depicted, showing an increase of approximately 16.43% from 2002 to 2022. Between 2004 and 2008, waste generation climbed steadily, nonetheless reaching its lowest level in 2011, a trend likely influenced by the global financial crisis that emerged around 2008. From 2012 to 2019, waste generation rose, probably due to factors such as population growth and increased household spending. In 2020, there was a slight decrease to 489 kg per capita, which can be attributed to a reduction in GDP (EEA, 2023). However, the average annual municipal solid waste generation of 496 kg per capita in 2022 was below the EU average of 513 kg per capita for the same year (Eurostat, 2024).

4.1 Potential of adapting international best practices to Chile's context

Implementing proven waste management strategies derived from international best practices within the context of Chile holds the potential to yield substantial benefits in mitigating Chile's waste management challenges. Practices on waste management are not one size fit all, nonetheless, such an approach enables Chile to gain insights from others, including Slovenia's experiences, thereby reducing the learning curve associated with developing effective waste management systems.

Ultimately, the objective is to understand how Slovenia dealt with its waste management issues and what are the factors that allowed to country to develop its WM efforts in such a solid way. As shown in table 2, it is illustrated exemplary practices from Slovenia's waste

management framework, underscoring their pivotal role in enhancing recycling rates, minimizing waste generation, and curbing landfill utilization within the nation.

Table 2: Best Practices on Waste Management

Best practices on Waste Management	Area of implementation	Achievements
Landfill tax	Slovenia	Decrease of waste being sent to landfill from 13,7% in 2012 to 4,7 % in 2022.
Implementation of the Waste Framework directive	European Union, Slovenia	Target to recycle and prepare for reuse, by 2025, 55 % of municipal waste generated: In Slovenia, the increase in recycling level of MSW went from 42% in 2012 to 62,4% in 2022.
Separate collection and door-to-door collection together with awareness campaigns	Slovenia	Lower frequency of collection of MSW &promotion towards zero-waste goals in Ljubljana
Pay-as-you-throw system	Slovenia	At the end of the month, they receive an invoice based on the amount of waste they recorded on their cards.
RCERO Ljubljana: Waste management center	Slovenia	Treatment of 1/3 of Slovenia MSW. By the end of its processing, less than 5 per cent of residual waste is disposed of at the Barje landfill.
Closure of landfills	Slovenia	Rehabilitate or close 28 illegal landfills around the country.

Source: Own work.

The Waste Framework directive (Directive 2008/98/EC) (European Commission, 2024), is a key piece of legislation in the European Union aimed at reducing the environmental and health impacts of waste, and some key elements of its legislation entail waste hierarchy, extended producer responsibility, establish waste prevention programmes, sets targets and demands reporting on these practices from the member states.

As shown in Figure 7, in Slovenia, the introduction of a landfill tax in 2001 marked a significant shift in waste management policy. This tax, imposed on landfill operators for waste disposal, initially directed revenues to the state budget until 2010, when a portion began to go to municipalities. Despite being relatively low compared to other countries, the landfill tax has played a role in reducing the amount of waste sent to landfills.

The decrease in landfilling (As shown in Figure 8) has coincided with an increase in recycling rates since its implementation. Revenues from this tax have been primarily

allocated to investments in waste management infrastructure, with a focus on landfill compliance and enhancing collection and recycling programs (EEA,2013).

The link between the landfill tax and recycling rate lies on the allocation of these taxes towards building recycling infrastructure in the country, as of after 2001, the recycling rate had started to fastly grow, increasing from 89.000 tonnes of MSW being recycled to 271.000 tonnes in 2010 (EEA, 2013).

In 2002, the capital city of Ljubljana commenced the separate collection of paper, cardboard, glass, other packaging materials, and residual mixed waste utilizing roadside containers. This initiative, undertaken by the public company SNAGA, was augmented in 2006 with the introduction of door-to-door collection for biodegradable waste. By 2012, SNAGA had phased out the roadside containers for paper and packaging, shifting to a door-to-door collection system. Following the successful implementation of this door-to-door collection in 2013, the company subsequently reduced the frequency of collections based on the population density of different neighborhoods, with the goal of aiding residents in sorting their waste more effectively (Oblak, 2015).

Equally important, was the involvement and commitment of citizens creating a great shift in the country's waste management, which led to the city aiming towards being zero waste. Awareness campaigns in which Snaga invited the local media, helped persuade Slovenians into sorting their waste more efficiently.

The failure to involve the public in interactive and participatory processes aimed at fostering understanding and appreciation towards WM, rather than mere acceptance, poses the risk of developing infrastructure that is not appropriately located, timed, or suited to the needs of the local community (Kirkman & Voulvoulis, 2017). This is further emphasized by Petts (2004), the lack of awareness in citizens when it comes to waste management, generates a view of "out of sight out of mind", specially deterring waste management prevention principle because it is seen as an unnecessary measure to be taken.

Awareness campaigns promoting proper waste management are prevalent throughout Slovenia, primarily led by SNAGA. These efforts are bolstered by various stakeholders, including non-profit organizations and private companies, which engage communities and disseminate information through recycling and reuse activities nationwide. SNAGA's focus extends beyond separate waste collection to promoting the principles of reduce, reuse, as well as responsible consumption among citizens. The national campaign "Get Used to Reusing" underscores the significance of reusing and consuming while respecting the environment and our wallet, "Raise your voice against food waste" encourages the reduction of food waste by emphasizing mindful purchasing habits, and "Kabiné Serinjon", promotes ethical and responsible shopping habits in the fast fashion industry (Oblak, 2015; Oblak, 2019).

The successful implementation of separate collection of waste, was followed by the pay-as-you-throw system, a pilot programme initially adopted in the city of Brezovica, in where a variable tariff was implemented on different types of household waste, together with a reduction of collection bins and frequency of pick up services. This successful implementation was instaurated in the city of Ljubljana, where collecting bins were moved underground for bio-waste, recyclables and residual waste, but only bio-waste and residual could be opened by a smart card for locals in which the amount of waste discarded was recorded and charged accordingly (EBRD, n.d)

The waste management center of RCERO, is the most cutting-edge waste treatment facility in Europe. The project includes an enlarged landfill, a leachate treatment plant, and waste recovery facilities. The center has the objective of recover the maximum amount of useful material and to decrease the amount of waste being disposed. The landfill commenced operations in 2009, complemented by the functional treatment plant initiated in 2011. The culmination of the construction for the mechanical-biological waste treatment facility, was achieved by the end of 2015.

Following an elaborate treatment process in which waste is sorted, and then moved to recycling facilities, non-recyclable items undergo processing to be converted into fuel. After this, a minimal fraction, less than 5 percent, of residual waste is ultimately disposed of in the Barje landfill (SNAGA, n.d).

The closure of landfills in Slovenia was mandated by the European Union to adhere to the Waste Landfill Directive, a measure in which they initially failed to meet its requirements. The measured was further emphasized from The Commission urging to deal with the 35 uncontrolled sites, that even though were not being actively used, posed as an environmental & health threat to all Slovenians (European Commission, 2017).

As part of this directive, Slovenia undertook measures to rehabilitate or close 28 illegal landfills (European Commission, 2017). According to Sres (2020), mentioned in an interview with Zero Waste cities "… we had to close many landfills due to insufficient health and safety standards, there was no other option but to improve our waste management. This began with just soft measures since there was no big infrastructural funding available any more".

Drawing parallels between Slovenia and Chile reveals potential avenues for knowledge transfer and adaptation. While Chile faces distinct socio-economic and geographical challenges, lessons from Slovenia underscore the importance of holistic policy frameworks, infrastructure development, and public engagement strategies in fostering a sustainable waste management ecosystem.

5 METHODOLOGY

This thesis's methodology section provides an in-depth account of the research design, data collection, and analysis methods that were employed to meet the objectives of this research and answer the research questions.

5.1 Research design

To comprehend the current state of the circular economy in Chile, I first reviewed secondary data. Secondary data came in the form of reports and journals online. It helped me conceptualize the topic and gain in-depth understanding of Chile’s most significant challenges to advance the circular economy agenda.

I used statistical sources from various public entities and regional/global organizations, it became evident that the country's primary issue is intricately linked to one of the fundamental principles of the circular economy: waste management. This led to the continuation of research aimed at analyzing international best practices in waste management, in order to advance Chile's circular economy agenda.

Subsequently, primary data collection was employed in order to answer the guiding research questions, following a qualitative approach, semi-structured expert interviews were conducted with key actors of the sustainability, circular economy and waste management sector. The selected interviewees represent leading organizations NPOs (non-profit organizations) in the area of circular economy and waste management.

Expert interviews are a method in research where detailed conversations are held with a number of experts in the field. Experts possess specialized and comprehensive knowledge about a particular topic, making interviews with them more likely to provide faster insights into processes, strategies, and other relevant details compared to interviewing non-experts (Van Audenhove & Donders, 2019; Trošt, 2022).

This qualitative method of research was chosen to delve into Chile’s unique environment and to explore how key local actors view the current and future challenges and opportunities, in waste management. Our goal is to understand their perspectives on pushing forward the circular economy agenda and tackling Chiles biggest problematic; waste management. By employing this qualitative research approach, our study aims to uncover measures that can improve waste management efforts and foster sustainable growth in Chile. On the other hand, expert interviews, were also held with representatives of Slovenia’s waste management, to understand the background of how the country became such a leader in the matter.

The interview covered three major topics: 1. To analyze the current state of Chile's circular economy efforts, specifically the challenges regarding its waste management systems, 2. International best practices in waste management (primarily from Slovenia) and adoption to Chile's context, 3. Recommendations for improving waste management in Chile & important areas to tackle.

The interviewees had the chance to expand on the topic as they thought more relevant with supplementary thoughts and comments from the organization point of view. The interview questions can be found in English and Spanish in Appendix number 2 and 3, respectively.

The interviews were conducted online, with the sample selected based on non-probability sampling, together with a combination of both convenience and purposive sampling methods. A non-probability sampling method was selected to specifically target a particular group, as this approach enables certain members of a population to have a higher likelihood of being chosen. There are primarily five types of non-probability sampling techniques, each serving different research purposes and contexts: convenience, purposive, quota, snowball, and self-selection (Forster, 2001).

Convenience sampling refers to the "convenience" it presents when selecting a sample. In this study, potential interviewees were sent emails and linkedin messages in Ljubljana, where I currently reside, and Santiago, my hometown, therefore, the convenience in it. This approach was complemented by snowball sampling, in which initial participants referred additional participants, allowing many interviewees to lead to subsequent ones (Albert, Tullis & Tedesco, 2010). As shown in table 3, each interviewee profile is presented.

Table 3:Interviewees profile

Number of interviewees	**Representing country**	**Name**	**Experience**
First	Chile	Tamara Ortega	Executive director of "Fundación basura", professor of natural sciences and biology in the Catholic University of Chile.
Second	Slovenia	Jaka Kranjc	Project lead in "Ekologi brez meja".
Third	Chile	Nicolás Behar	Professor of sustainable development in the Catholic University of Chile- CEO & Cofounder of Recylink.
Fourth	Chile	Felipe Marchant	Environmental management director of "La Pintana" municipality.

Source: Own work.

The aim was to include experts who could provide valuable insights, and have as many interviews as necessary in order to reach data saturation, this was reached with three different interviewees, experts on different areas of waste management and sustainability. Additionally, the selection was based on geographical expertise, incorporating perspectives from both Chile and Slovenia to establish a comprehensive, two-sided view on the subject. The chosen research method was selected in order to learn whether international best practices could be potentially adopted in a different economic, social and political context, and whether policies and initiatives can create significant change no matter the particularities of Chile.

5.2 Analysis of data

Following each interview, a transcript was prepared and made available to all relevant parties, in order to ensure accuracy and integrity of the data collected during the interviews. By providing a detailed record of the conversation, the transcript allows for thorough review and verification of the information provided, thereby enhancing the reliability and validity of the research findings.

Manifest content analysis involves the systematic organization and categorization of data based on the explicit words and phrases used by participants, as opposed to latent content analysis, which seeks to uncover underlying meanings (Graneheim, Lindgren, & Lundman, 2017). This research employs qualitative and inductive approach and thematic analysis (a method for identifying themes that arise within data) to categorize the interviewees' responses into coherent themes, facilitating a deeper understanding of the data and the identification of significant patterns and insights.

In order to create a link between data collection, and data analysis, coding was selected for a precise analysis and better report of findings. The authors Richards & Morse (2016), discussed coding as “It (coding) leads you from the data to the idea, and from the idea to all the data pertaining to that idea”.

In qualitative research, a code typically consists of a word or short phrase that symbolically represents a summary, key characteristic, essence, or evocative quality of a segment of language-based or visual data. In this particular instance, the data was derived from interview transcripts (Manning, 2017).

The process involved thoroughly reading through the transcripts and inductively developing codes, resulting in a comprehensive codebook shown in table 4. This codebook highlighted various themes and patterns, which informed the continuation of our findings.

When examining the findings chapter, readers will encounter a thorough analysis of several overarching themes. These themes surfaced through the careful use of the previously

identified themes. The Codebook's detailed collection of themes, keywords and concepts sheds a light on the interviewees' perceptions and on Chile ‘and Slovenia’s efforts and challenges to advance the circular economy agenda, focusing on one of its main principles, waste management.

Table 4: Codebook

Code	Description	Examples
Compost	Refers to the progress of decomposing organic waste that can be turned into a nutrient-rich soil called compost.	“If we take out this fraction, we compost it, you’ll have almost free fertilizer” (First interviewee) “...having programs or some sort of incentive for people to compost at home for example, or to have communities at community composting programs and stuff like that.” (Second interviewee)
Organic	Referring to biodegradable waste, or waste that can be decomposed such as food scraps and yard waste.	"One wonders why we don't start, for example, with organic waste, which covers a much larger amount." (First interviewee) “The amount of organics in our mixed waste is still very high. So clearly, even though we're collecting waste separately, not all of it...” (Second interviewee) “When we first faced financing issues in 2005 and decided to start separating vegetable waste, we asked ourselves how to convince people without any economic incentives to offer.” (Fourth interviewee)
Infrastructure	Systems and facilities used to handle, collect, transport, treat, and dispose of waste in a safe and environmentally responsible manner	“…desire and motivation are still there. I feel that the infrastructure is a little lacking” (First interviewee) “You need to focus probably a lot on infrastructure (there) to enable things first, but you know, once you have a certain level, infrastructure can only get you so far.” (Second interviewee) “Regarding infrastructure, we are catching up quickly. So, I don't see it as that complex.” (Third interviewee)

(Table continues)

(Continued)

Table 5: Codebook (cont.)

Extended producer responsibility (REP in Spanish)	Policy referring to the manufacturers' responsibility for the post-consumer disposal of their products, including collection, recycling, or safe disposal.	"We have the REP (EPR) law, which is a totally confusing law. Municipalities need to implement it, but they don't even understand it" (First interviewee) "So, it's good to identify things that should have extended producer responsibility like textiles like…" (Second interviewee)
Segregated collection	Refers to separating different types of waste materials at the source into designated categories to facilitate proper disposal, recycling, or composting.	"If segregated collection is at your doorstep, there's no reason not to do it" (First interviewee) "People are incentivized monetarily, to properly separate the waste and in some say is also to produce less of it" (Second interviewee) "Our waste management ordinance already offers a 50% reduction for households participating in our separation programs, recognizing their effort." (Fourth interviewee)
Culture	Refers to how a community, organization, or culture handles waste in terms of attitudes, behaviors, values, and practices.	"...but cultural change and regulations are very slow processes for the time we actually have left in this landfill timeline" (First interviewee) "There is funding, but no will or environmental culture…." (Third interviewee) "Mayors need academic training to understand that cultural transition mechanisms require permanent financing and support." (Fourth interviewee)
Awareness	Refers to understanding the importance of proper waste handling, including awareness of environmental and health impacts of improper disposal and benefits of waste reduction, reuse, and recycling.	"…this work on education, on awareness, raising on having information, the ability, this is a never-ending thing." (Second interviewee) "I do think there should be socio-environmental awareness campaigns on television to reach other audiences." (First interviewee) "Developing these habits is challenging, but crucial. However, public policies often don't account for this. Simply dictating orders isn't enough; a process of community engagement and habit formation is necessary" (Fourth interviewee)

(Table continues)

(Continued)

Table 6: Codebook (cont.)

Implementation	Refers to the process of enforcing the public policies and plans made by governmental authorities to accomplish certain goals.	"...we need more resources and funding for proper implementation." (First interviewee) "...everything is positive on paper, but implementing it is the hardest part." (Third interviewee)

Source: Own work.

6 FINDINGS AND DISCUSSION

In this section, the findings from the expert interviews are highlighted and analyzed to address the initial research questions. The subsequent sections present the most pertinent and frequently recurring topics identified in the data. I complement the data from the experts with insights from secondary sources, used to deepen the context or explore points initiated by them.

The most relevant questions answered arisen as, what is the area in which Chile needs to focus in order to steer its waste management efforts into the right direction? What best practices from Slovenia could be adapted into Chile's context? What is the first step a country like Chile can take to properly address its waste management challenges?

The findings were organized as follows: the initial concepts are those that frequently emerged among interviewees, were identifying through a coding procedure, and deemed the most attainable and important objectives to discuss, given Chile's progress in the circular economy. These concepts presented as the first thoughts of our interviewees when considering effective waste management practices in Chile.

When assessing the validity of the information gathered from four expert interviews, it is critical to highlight the meticulous methodology used in spite of the small sample size. Expert interviews were chosen as the main technique on purpose because of the depth of understanding and specialized knowledge these people could offer in the area of study, from academics & business owners to policy experts and general director of non-profit organizations.

After four interviews, data saturation was reached, indicating that all of the major topics, research questions and viewpoints pertinent to the study question had been sufficiently explored and included in the sample. This saturation point indicates that conducting further

interviews is unlikely to produce significantly new insights, supporting the validity of the results given the constraints of the selected approach. Furthermore, the subjects' qualifications also contribute to the data's increased validity. However, of the context, understanding challenges and barriers is a critical step to identifying the most appropriate solutions (UNEP & ISWA, 2024).

6.1 Biodegradable waste collection

Interviewees emphasized the collection of biodegradable waste (bio-waste or organic waste) as a crucial first step to address waste management challenges, especially when it comes to the lack or reduced amount of waste being segregated.

6.1.1 Concept definition: Biodegradable waste & its importance

Biodegradable waste is a type of waste, which originates from plant or animal sources, and can be degraded by other living organisms (Hong, El Hady, Joo, & Shin, 2012). This decomposition process converts complex materials into simpler organic compounds, which blends into the soil, posing minimal environmental risk (Popoola, 2023).
Waste collection refers to a part of waste management that involves gathering waste and storing it in preparation for transportation to the waste processing facility (SPOT, 2023).

6.1.2 Chile’s biodegradable waste situation

Biodegradable waste represents a great fraction of municipal solid waste. In Chile, approximately 58% of municipal solid waste by weight is organic waste (MMA, 2022a). Therefore, diverting and properly managing this waste fraction can have significant effects on the overall waste management.

The first interviewee, mentioned how the collection of bio-waste in each municipality is still a project that is being discussed of in the Chilean government, and whether this project might pass as a potential law, is something that is yet to be seen. According to the expert, starting with the proper discarding of organic waste could be a very straight-forward and simple task to be carried by both the government and the local communities.

The success case of "La Pintana” was highlighted, one of the poorest and most conflictive areas of Santiago, which has been for the past 20 years collecting door-to-door organic waste, representing 50% of the total MSW generated in the municipality, waste of which then undergoes natural processes such as composting and vermiculture, ultimately being transformed into high-quality fertilizer that is then used by the community. This initiative has resulted in remarkably high levels of bio-waste collection, which has been sustained over time. However, replicating this model in other municipalities and at the national level

presents significant logistical and implementation challenges. According to our first expert, these challenges are exacerbated by the contractual ties that municipalities have with their local waste collectors. These long-term contracts, spanning up to 50 years, often restrict municipalities from innovating or implementing changes in waste collection practices (further discussed in section 5.4).

The fourth interviewee, responsible of starting the initiative in La Pintana municipality, and current environmental management director said " That madness that we proposed many years ago there, was not so crazy but rather it was part of the path that had to be followed to achieve good waste management", twenty years ago he proposed a project for the planification of separation of waste in source in an time and area there was no previous proposals or interest for the matter. He further mentions, while this effort has managed to "reduce the curve" of municipal waste generation, the municipality's population is still growing exponentially, so waste collection is still affected, albeit less so than it would be if organic waste were not separated.

Initiative 27, for a roadmap for a circular economy by 2040 has the short and medium term goal of "Launch a program to support municipalities and regional governments in the implementation of organic waste management and recovery systems at different scales, in order to achieve the goal of recovering two thirds of municipal organic waste established in the National Strategy for Organic Waste".

Chile and Canada have partnered to create Chile's National Strategy for Organic Residues, approved in 2021, which sets very ambitious goals for the future of organic waste management by 2040. The strategy proposes that within the next 20 years "We can take advantage of two out of every three kilograms of organic waste, putting ourselves at the level of the most developed countries in the matter and moving decisively towards a circular economy" (MMA, 2022b).
Considering the government's awareness and proactiveness with the challenges of organic waste and its segregation, the implementation of these initiatives appears to be a challenge, which will be discussed in 5.4 "Strong policy implementation & visibility".

Summarizing, the importance of bio-waste management is huge considering the share of the overall municipal solid waste generation rate as well as its environmental impact when improperly managed. Not only that, but its implementation, could be done in a municipal/community level, creating an important link between awareness and incentives, in the form of compost, in a costly-efficient way.

6.1.3 International best practices

The second interviewee mentions two key ideas on biodegradable waste, first, the flexibility and easiness of implementing change in the way a country manages its waste, starting by

bio-waste initiatives, emphasizing “even if you don't mandate separate collection of biowaste, just having programs or some sort of incentive for people to compost at home for example, or to have communities at community composting programs (…) it is not only a fertilizer but it brings communities together”. Further mentioning that back in 2006 when Slovenia started to segregate bio-waste collection, key policies also took part that like the pay-as-you-throw system, efforts which contributed to Slovenia becoming a waste management success story.

Secondly, implementing door-to-door collection of bio-waste as a segregated category at the community level could be achieved in a fairly cost-effective way. This approach not only facilitates waste management, by reducing the amount generated but also contributes to community engagement. According to Oblak (2019), the 2006 introduction of door-to door collection of biodegradable waste, was the main factor contributing to the notable increase in recycling rates, and a crucial component of Ljubljana's successful outcomes.

By transforming bio-waste into compost, communities can benefit from a valuable resource that enriches soil health and promotes sustainable practices. Therefore, this initiative has the potential to foster a positive impact on the local community. In Sweden, the introduction of segregated collection for biodegradable waste reduced the amount of MSW generated by 30% (Dahlén et al., 2007).

6.2 Monetary fines to curb waste generation & door-to-door collection

The second most mentioned measure when addressing proper waste management lead us to monetary fines and door-to-door collection services, and the positive impact this had internationally when addressing waste management.

6.2.1 Concept definition: Monetary fines to curb waste generation & door-to-door collection

Monetary fines like the pay-as-you-throw system is designed to encourage people to try harder to separate their waste at the source (EEA, 2022).

Door-to-door waste collection refers to the collection of waste from door steps of residential and non-residential premises, such as households and commercial establishments (Law insider, n.d). They are often times used to maximize waste segregation and sorting, and the service is generally used to refer to municipal waste collection system (Evreka, 2024).

6.2.2 Chile's monetary fines and door-to-door collection

As seen in subchapter 2.2.1, In Chile, the implementation of fines is emphasized in the EPR law, not for citizens but rather for companies that fail to meet the valorization and recycling targets set by the government. The polluter pays principle, which targets companies in Chile, differs from the pay-as-you-throw concept, focused in citizens. While the latter is yet to be established in Chile, in Slovenia, it imposes fines on all citizens, significantly impacting the view on waste management from the consumer perspective, creating, a significant change on the way people not only discard and segregate their waste but also in their consumer purchasing behavior.

Our fourth interviewee discussed how the pay-as-you-throw system could positively and drastically alter waste management in Chile. However, he emphasizes that this measure must be taken nationally, as a law, so people are obligated nationwide. Since Chileans are already accustomed to not paying for waste collecting services, no mayor wants to impose an additional charge on it as it affects its reelection for another four years of mandate.

Our second expert underscored the benefits of the pay-as-you-throw system in many different ways, by encouraging individuals to both properly separate their waste and reduce the amount they produce, he mentioned that this system does not only incentivize responsible waste management among citizens but also creates benefits for waste collection services, like collecting trucks, by decreasing the volume and frequency of waste pickups, thus optimizing logistical operations. According to the expert, the reduced waste volume directly translates to fewer and more efficient collection routes. Furthermore, the expert emphasized that the success of this approach is closely linked to the implementation of door-to-door collection services. This next step is crucial for ensuring that waste separation is convenient and easily accessible for residents, thereby promoting higher participation rates and more effective waste management overall.

The idea of creating convenience and ease to participate in waste segregation was also pointed out by expert number one, emphasizing how the lack of infrastructure and inconvenience for waste separation limited residents to participate in these efforts. She mentions that Chileans are very likely to engage in recycling and sorting their waste, as long as the infrastructure is in place and doesn't present as an inconvenience.
In a study conducted in 2022, showed that even though 55% of people would be willing to recycle, the lack of infrastructure was a great impediment, with 41% of the population unwilling to do so due to lack of home collection services (GfK, 2022).

In Chile, the Extended Producer Responsibility (EPR) law, enacted in 2015, mandates the implementation of mandatory door-to-door collection services for packaging waste (plastic, cardboard, glass, cans, etc.) in the upcoming years. On May 17th, 2024, the Minister of the Environment, Maisa Rojas, announced that this year, the coverage of the truck collecting

containers and packaging – one of the innovations of the REP law – would be expanded from 21 to 48 communes nationwide (Induambiente, 2024). Chile comprises 345 communes (BCN, 2022).

6.2.3 International best practices

Adhering to the principles of the waste hierarchy, prevention being recognized as the first and most important measure in waste management, Slovenia introduced a very successful initiative, where higher collection fees are imposed as the volume of waste collected increases, and therefore, reducing the amount of waste generated. This policy has demonstrated significant efficacy in reducing waste generation in the Ljubljana region, as mentioned by our second expert from Slovenia.

The pay-as-you-throw system was mentioned by the second interviewee as a success initiative from Snaga company, in which, people were given a card to record the amount of waste being discarded and charged accordingly (SNAGA, 2021; EBRD, n.d). The implementation of the pay-as-you-throw system has demonstrated considerable success in reducing waste generation in the Ljubljana area. By financially incentivizing individuals to decrease their waste production, this system effectively motivates residents to minimize their waste disposal expenses.

Different countries, deal with payment fees differently. Penalties for non-compliance with waste segregation have proven effective likewise. For instance, in Zhengzhou, China, the implementation of penalties for residents who failed to separate waste successfully encouraged compliance toward this goal. The positive outcomes from Zhengzhou underscore the importance of introducing and enforcing penalties to promote adherence to waste segregation practices (Hao & Xu, 2023).

Connected with our previous strategy on international best practices, the importance of segregating biodegradable waste must be connected with how this waste is being discarded. The importance of properly disposing biodegradable waste was highlighted by our second interviewee, mentioning that if not properly managed (biodegradable waste), can release gasses into the environment such as methane, which can be highly toxic in big concentrations. He further emphasized Slovenia's success in the door-to-door collection of bio-waste, indicating the potential it has to be implemented by other countries.

The implementation of door-to-door collection was previously highlighted as one of Slovenia's best practices in waste management, in 2015 Ljubljana was the European capital with the highest amount of separately collected waste. According to SNAGA (n.d), the implementation of door-to-door collection was crucial for Ljubljana's success, when recycling rates were significantly boosted.

This consequently resulted in a decrease in the amount of residual waste being generated. According to our second expert, current efforts in Slovenia's waste management are focused on eliminating residual waste entirely by examining its remaining components—primarily diapers, coffee capsules, and occasional construction waste. These items are being specifically targeted with the EPR law. Considering the progress already achieved, this initiative represents an additional effort by Slovenia to further advance its waste management practices.

6.3 Infrastructure & Awareness campaigns

The concepts of infrastructure and awareness were consistently emphasized by our experts throughout their interviews. They highlighted the critical importance of not only investing in infrastructure but also complementing these efforts with awareness campaigns and educational initiatives. This dual approach is essential for achieving sustainable and effective waste management practices. According to OECD (2020), prioritizing the establishment of basic municipal solid waste collection services and infrastructure to meet minimum waste management standards, alongside transitioning from landfilling and incineration to waste prevention, reuse, and recycling, should be a priority.

6.3.1 Concept definition: Infrastructure & Awareness campaigns

The collection, storage, treatment, and disposal of waste necessitate proper infrastructure to ensure it is conducted in a manner that does not pose risks to the environment or public health. Waste infrastructure encompasses a range of components, including waste collection vehicles, transfer stations, landfills, recycling facilities, and waste-to-energy plants (Kanatas, 2023).

Increasing awareness on all levels is essential to solving the issue of waste and its generation, as knowledgeable consumers are more likely to make ethical decisions about waste management, material usage, and consumption (Un Sacco Pulito, 2023). These awareness efforts could be disseminated through a variety of communication tactics, including the distribution of printed materials, the planning of open forums and training sessions, expert advice, communication via social media and mass media, and the use of unofficial networks to disseminate information (Climate-ADAPT, 2023).

6.3.2 Chile's waste infrastructure & awareness campaigns

Our first interviewee mentioned that the responsibility for establishing waste segregation points falls on each municipality in Chile, as mandated by the REP law. However, she emphasized that this process is still in its early stages, describing it as "incipient." Recognizing that recycling is not the most effective initial step according to the waste hierarchy, she asserted that there remains much to be accomplished. Additionally, she

highlighted that residents tend to engage in waste separation only if convenient infrastructure is readily accessible, rather than making a concerted effort.

This is further confirmed by the "Reciclando-Ando" study, although 55% of people in Chile would be willing to take their garbage to recycling points, the main barrier for not doing so is the available infrastructure: 62% do not do it because they do not have a collection center nearby, 43% because they do not have space to separate waste at home, and 41% due to lack of home collection services (GfK, 2022).

Further importance on the significance of convenience in waste sorting was mentioned by our first interviewee, exemplified by the reluctance of Chileans to opt for returnable bottles when purchasing beverages due to the perceived inconvenience this presents as, compared to the ease of selecting disposable products over more sustainable alternatives during shopping. She mentions that among Chileans "Trash is something negative. I take it out, it disappears from my sight, and I don't want to hear about it anymore", she emphasizes on the importance of improving this negative relationship with what is not trash into what is not waste, which are recyclables and compostables.

She further mentions, proper waste management or just recycling in Chile is often viewed as a trend or niche sector. Information on these topics is typically disseminated through very brief television segments, hindering the development of effective awareness campaigns for the public.

According to our fourth interviewee, the municipality's success with bio-waste collection was largely due to the customized approach for awareness campaigns they adopted for this specific community. Face-to-face communication and persuasion were necessary to convince those with limited time and resources to exert extra effort. He further emphasizes, conversating and building trust was essential to demonstrate to the community at large the advantages of segregating organic waste so they can test it out and eventually implement it over a longer period of time. But in order to understand local issues, it is necessary to "strengthen municipal institutions, with a minimum standard" and concentrate on smaller-scale settings, he says "I think there is still a way to go and that is what we are missing in my opinion, it is the process of linking with the community".

The evident lack of awareness is clear. When Chileans were asked why they don't participate in waste segregation: 44% said they do not have the habit to do so, 25% don't know enough about recycling and, 21% thinks that all recycling categories can be put together (GfK, 2022).

6.3.3 International Best Practices

According to our second interviewee, the consideration of infrastructure investment is contingent upon the society's stage of development. He mentioned, "it's like a glass ceiling (…) you need to focus probably a lot on infrastructure (there) to enable things first, but, once you have a certain level, infrastructure can only get you so far." To achieve effective waste management, the interviewee emphasized the importance of a multifaceted approach, integrating infrastructure, legislation, and consumer awareness. He highlighted how awareness raising and working on education is a never-ending campaign to generate understanding among the population.

A pivotal factor contributing to Ljubljana's remarkable achievements was the implementation of the right infrastructure, initially with eco-islands (curve side collecting points for packaging waste) and door-to-door collection services, particularly for biodegradable waste, which significantly boosted recycling rates. Not only that but, as separate collection initiatives expanded, the volume of residual waste consistently decreased. This initial success scheme was complemented by Snaga's adept communication strategies, which effectively rallied the population behind their objectives and decisions, overcoming initial resistance (Oblak, 2019).

Engaging in informed local debate and ensuring community participation are crucial elements for the effective delivery of infrastructure projects in waste management (Kirkman & Voulvoulis, 2017). According to all of our interviewees, the socio-cultural aspect of waste management is crucial to address. Our third interviewee identified culture and will toward environmental efforts one of main factors that need to be addressed.

Zorpas (2020) highlighted the significant impact of inadequate awareness and promotional efforts on waste generation, while Petts (2004) underscored the predominant influence of technical experts in waste governance discussions, often excluding citizen involvement.
This thought was equally mentioned by our first interviewee, who mentioned the biggest issue when it comes to creating awareness around waste management and to teach communities about proper management of waste, is reaching a wider audience, being allowed to have a space in the media, and generate interest in the topic. While waste management is recently being integrated in some university programmes, such as nutrition, concepts like food waste are being put upfront. Nonetheless, barriers to entry persist, relegating waste management and the circular economy to a niche sector in the public consciousness.

The interviewee underscores the insufficiency of general public involvement in this domain, noting the recurring participation of the same people in environmental initiatives, events, etc. Hence, enhanced engagement in waste management endeavors in Chile is highly encouraged.

6.4 Policy implementation

6.4.1 Concept definition: Policy implementation

Policy refers to a consistent and intentional course of action that actors follow to address the matter of concern (Anderson, 2003). It can refer to frameworks of laws, regulations, and actions that governments enact to accomplish social and economic objectives (O.P. Jindal Global University, 2023).

6.4.2 Chile's policy implementation

Chile possesses similar laws, and initiatives for waste management as Slovenia, as discussed in chapter 2. The EPR law, single-plastic use law, the roadmap to a circular Chile by 2040 and the National organic waste strategy Chile 2040, being the most relevant ones. The question arises: why has the country been unable to curb its waste generation, reduce the amount of waste sent to landfills, and close both legal and illegal dumping sites?

Our first interviewee highlighted the lack of visibility and enforcement of laws in Chile, such as the single-use plastic law "Ley de plástico de un solo uso," which has been in effect for over a year and a half. Fundación Basura has taken on the task of raising awareness among consumers about the ban on single-use plastics. An example discussed was that food courts are required to provide only recycled products to their customers, a measure that must be fully implemented by August of 2024, and so, avoiding single use plastic. However, to date, only two shopping centers in the Metropolitan region have complied with these regulations. The expert emphasizes that these food court companies are "…engaging in significant political lobbying to postpone the regulation and to allow disposables to be permitted within the consumption inside establishments. So, even though we have the law, the company is still trying to ...undermine it or expand it to their benefit".

Another significant law implemented by Chile is the Extended Producer Responsibility (EPR) law, also known as the recycling law. This is the most important legislation in waste management and represents a great step in the right direction, but according to our first interviewee "…we need more resources and funding to properly enforce these laws", but not only that, the implementation factor plays a huge role.

Our third expert talked about how Chile adopted the European Union's EPR law and stressed the importance of this legislation—especially considering the significant financial expenditure required to keep it operating. He also stressed that the enforcement of these restrictions is more important than the legislation itself, saying, "We take that extremely lightly." For these reasons, he is working to assist companies in implementing the new regulation into their daily operations. He claims that the difficult part of implementing this policy is actually putting them into practice, even though "everything is positive on paper."

Municipalities in metropolitan Chile have a crucial role of implementing the EPR law specifically waste management practices. In a debate hold by public and private parties about the implementation of the EPR law (USS, 2024), the Chilean association of municipalities mentioned "…Many municipalities still do not fully understand the law due to its complexity", he also highlighted the rigidity of some contracts in waste disposal, which discourages recycling and valorization.

This idea was also brought to light by our first interviewee, highlighting how these multi-year long contracts create limitations that hinder those in charge from implementing meaningful change. The success case of "La Pintana" municipality in Santiago is a great example of this, with little investment they have been able to continuously maintain a significant level of waste valorization and bio-waste segregation. Our interviewee asks herself "If a very low-income community can do it, why can't the others? And here, it's also been frequently suggested. Obviously, there's a lack of logistical capacity to implement it, but also, there are issues such as when you say that Chile is the cradle of neoliberalism—it's true. We have waste management contracts tied up for 50 years.".
This issue is only further accentuated by the struggles many municipalities face, as they do not receive funds for environmental initiatives. Municipal personnel are required to enforce the law, but municipalities receive no funding for this, even though some have only one person working on environmental issues, as mentioned by our first interviewee.

6.4.3 International best practices

Our second interviewee, emphasized the relevance of having appropriate legislation in place, as it can serve as an enabling factor and set the stage for effective waste management. However, he mentions, laws like the EPR are quite complex and necessitate significant interaction among various stakeholders. The role of the government and governmental policies turns to be indispensable for promoting sustainable waste practices and safeguarding public health and the environment (Yajnik, 2024).

In a progress report by the SDG Watch Europe (2020), Slovenia was recognized for making significant progress in decoupling environmental impacts from economic growth, energy consumption, and waste generation and management. The report attributes these achievements to change in legislation, policy instruments, and the establishment of municipal waste management centers. As a result, Slovenia increased the percentage of waste collected separately and improved its recycling rate.

As discussed in chapter 3 "International best practices: Waste management", Slovenia, through the influence of the European Union, has focused immensely in complying to different policies and directives. Treacy (2023), highlights the importance of having robust

policy implementation and engagement among all stakeholders. This is particularly relevant, as countries within the EU must implement the policies set by the European Comission.

The question of where Chile needs to focus its efforts to improve waste management, considering it already has laws, roadmaps and initiatives in place, yields a clear answer: the primary challenge is the practical implementation.

6.5 Ban of landfills

The EU has aimed to reduce waste going to landfills, treating landfilling as a last resort. Since 2010, the landfill rate has decreased from 23% to 16% in 2020. This reduction has been achieved through taxes, incentives, and infrastructure development (EEA, 2024).

6.5.1 Concept definition: Ban of landfills

Landfills are sites used to discard waste, which is deposited into or onto land in a landfill and are located and designed in a way that avoids contaminating the environment (Chocola, 2024; EPA, 2024; Eurostat, 2023). Despite of the technological safeguards like bottom sealing, landfilling can have a negative impact on the environment as it can lower the quality of surface and groundwater (EEA, 2024), release harmful gases like methane, contaminates surrounding water bodies and reduces soil fertility because of toxic leachate, as well as its management is highly expensive as it requires long-term plans and infrastructure to manage waste's slow decomposition and lessen its negative effects on the environment (SL Recycling, 2023). Therefore, avoiding waste generation altogether is a long-term goal to transition to a circular economy (EEA, 2024).

Reducing the number of landfills can be achieved through policies like landfill bans and taxes, as well as incentives for both recycling and its infrastructure (EEA, 2024).

6.5.2 Chile’s landfill situation

Chile’s roadmap to a circular economy has, many objectives targeting landfills, as one of the country main problematics. Initiative 17 has the short- and medium-term goal of “Gradually ban the sending of specific waste streams to landfills, such as those that are already collected selectively and could easily be recovered, for example, urban gardens and trees pruning waste” (MMA, 2022a).

The third interviewee emphasized how crucial it is to guarantee public policies are not only created but also enforced. He said, "The landfill issue is a matter of public policy and enforcement because it's one thing to have a public policy and another to enforce it." This

emphasizes the disconnect between the creation of policies and their actual application. He responded clearly when questioned further about the critical first step Chile needs to take to strengthen its waste management efforts: "Illegal landfills, enforcement." His focus on enforcement highlights an important area that needs to be improved in order to make current rules effective and make real progress in waste management.

Our second interviewee, mentioned how the landfill directive created a huge impact in the way Slovenia managed its waste, however, the country lost its funding for around 7 years to invest in infrastructure, which led them to find different ways to handle waste management. With the introduction of the landfill tax in 2001, funds were heavily invested in Slovenia's public infrastructure over the following four years. This significant increase in funding was primarily aimed at complying with the EU Landfill Directive, which included investment in landfills for municipal and hazardous waste as well as collection and recycling programme (EEA, 2013).

The question arises as, could these measures be taken in Chile's context? Currently, the main problematic is funding, and according to Marcel Szantó, academic in waste management, "People pay very low taxes for waste disposal, so municipalities do not have the budget to maintain high-standard facilities." (La Tercera, 2019). In Chile, approximately 77% of households are exempt from paying taxes "contributions" that cover waste management. This exemption is closely exacerbated with the insufficient funding that municipalities experience (Thiele, 2022).

Chile's situation differs greatly from other countries because of its distinct socioeconomic and environmental circumstances. The government is leading national-level initiatives to enhance waste management practices all around the nation. However, in contrast to other regions, there are unique challenges associated with the implementation of these initiatives. Furthermore, additional exploration is needed to determine the feasibility and effects of the idea of an abrupt landfill ban.

6.5.3 International best practices

Highlighted by our second interviewee, the ban on landfills in Slovenia was identified as a pivotal moment in the country's trajectory towards exemplary waste management. This decisive action marked the beginning of Slovenia's journey to becoming a leader in waste management among European countries and a prominent advocate of zero waste initiatives. This change in policy not only showed Slovenia's dedication to environmental sustainability, but it also established a standard for other countries, like Chile, looking to improve their waste management procedures.

The closure of many landfills in Slovenia came along with new European standards to which the country had to comply with, and according to our second expert, this presented as great

challenge that needed to be dealt with the proper solutions. He mentioned "… the closure of landfills (..)we had to deal with the waste somewhere else. That was the reason that we started separately collecting waste..."

Over two decades ago, the majority of Slovenia's municipal waste was landfilled, as shown in Figure 7. However, as shown in Figure 8, the rate of waste being sent to landfills decreased significantly in a period of ten years. According to the second interviewee, this closure of landfills was due to practices "inherited" from the European Union, which Slovenia was fortunate to adopt, regardless of the country's initial level of ambition to address the actual issue of waste landfilling, resulting in Slovenia's initiative to segregate waste collection of bio-waste by 2012, a measure that became mandatory in an European level by the end of 2023 (EEB, n.d). Furthermore, according to the EU Landfill Directive, by 2035, Member States must cut the percentage of municipal waste dumped in landfills to 10% or less of the total amount of waste produced in municipalities, goal that was achieved already in 2021 by several countries, among them, Slovenia (EEA, 2024).

6.6 Implementation of International Best Practices to Chile's context

Expanding on our conversations regarding challenges, areas of prioritization, and actionable steps with all interviewees, a central inquiry arises: Can Chile incorporate or draw inspiration from initiatives from Slovenia's best practices in waste management?
This pivotal question reflects a contrast in perspectives, from Chilean and Slovenian experts. All Chileans experts, show positivism in reaching similar goals to those achieved by Slovenia, however admit there is a long road ahead. The Slovenian expert expressed lack of knowledge of the Chilean situation in waste management, and clearly stated that initiatives cannot be transposed from country to country.

Our third interviewee expressed optimism, stating, "I don't think we are far off from what is done in the European Union." He highlighted the success of initiatives like the one in the "La Pintana" municipality as evidence of their effectiveness, citing them as examples that works well. Additionally, he emphasized that Chile possesses the human and technological capabilities necessary to emulate European practices, noting the rapid progress in infrastructure development, pointing it as the least of the worries. He therefore believes that those policies, enforced in Slovenia, can be implemented and are not too complicated to enforce in Chile, which adds to his faith to the country's capacity to progress waste management efforts. He further emphasized the only area in which Chile needs to focus its efforts, and that is, related to the change of mindsets of citizens, in order to end illegal landfills that pose as a threat to resident's health.
Likewise, our first interviewee, also from Chile, upon discussing Slovenia's waste management initiatives such as door-to-door collection, bio-waste separation, throw-as-you-pay and landfill closures, remarked, "Yes, it is totally adaptable..." She similarly underscored the success story of "La Pintana." However, she pointed out a significant challenge in

implementing such initiatives, different from our previous interviewee, stating, "There's a lack of logistical capacity for implementation." This observation highlights a critical barrier to effectively replicating successful waste management strategies, indicating the need for addressing logistical challenges to ensure successful implementation.

According to our fourth interviewee, Slovenian waste management practices could certainly be applied to Chile. However, the main obstacle is the conflicting interests of politicians. Funding such initiatives is less desirable than projects like building community football fields, which may not even be necessary. Additionally, most Chileans are exempt from paying waste taxes "contributions", making it extremely difficult for municipalities to manage waste segregation. This issue is compounded by the lack of support from regional governments for environmental initiatives, leaving municipalities with very little funding for waste management. He further highlighted the unique challenges faced by municipalities, as they are responsible for proper waste disposal.
The problem is twofold: first, regional governments do not provide incentives for municipalities to engage in effective waste segregation; second, municipalities lack the necessary funding to make improvements. He emphasized the challenges posed by the EPR law, stating, "We continue to capture a significant number of tons of waste per day...it is still an expense, an expense that the municipality assumes...it is still a cost. So, there is no incentive for municipalities to implement it."

In contrast, the second interviewee, from Slovenia, highlighted the challenges of directly implementing programs and policies across different contexts, considering the unique characteristics of each environment. He noted that a one-size-fits-all approach is often impractical due to varying local conditions and needs. Despite these challenges, he stressed the importance of adaptable initiatives that require minimal financial resources, such as focusing on bio-waste collection and management. Such initiatives can be tailored to fit specific local circumstances, making them more feasible and effective in promoting sustainable waste management practices across diverse settings.

Clearly, the adoption of Slovenia's initiatives has significant potential for adaptation within Chile's context. However, as highlighted by our interviewees, the country may face various barriers, including cultural, logistical, and economic challenges. To successfully integrate these initiatives, Chile must address and overcome these obstacles. This situation is similar to the challenges faced in advancing towards a circular economy, which Kirchherr et al. (2017) categorize into four main types of barriers: cultural, regulatory, technological, and market. Cultural barriers may involve resistance to change and deeply ingrained societal norms. Logistical barriers might include infrastructure limitations and practical implementation issues. Economic barriers involve financial constraints and the costs associated with the transition.

7 RECOMMENDATIONS

Chile still has significant progress to make in its waste management efforts. Four concepts consistently emerged throughout the research and discussion of findings.

7.1 Policy implementation

First, Chile needs to match its efforts in creating new policies and laws with effective implementation and enforcement at the local level. Laws like the EPR (Extended Producer Responsibility) are overly complicated and have ambitious goals that require a strong waste management foundation to succeed.
Research highlights a lack of law enforcement as a major issue, a concern echoed by both of our Chilean interviewees. While the Extended Producer Responsibility (EPR) law addresses waste at the end of the lifecycle, effective implementation must begin with product design. Innovation in waste prevention needs both financial support and encouragement. An informed and active community, along with municipal collaboration, is crucial for effective selective collection and waste valorization.

7.2 Collaboration among stakeholders

Second, despite the development of legislation through international collaboration, it is crucial to involve the community and local stakeholders to drive change from the bottom up. The community must be involved in Chile's efforts to create an efficient and sustainable waste management system. Only thorough community engagement will result in meaningful advancements in waste management. This means creating awareness of the benefits of appropriate waste management among the general public, especially in vulnerable communities. Proactive waste management techniques are crucial for protecting community well-being and environmental integrity in areas threatened by illegal landfills, such as vulnerable areas where health, environmental, and quality of life concerns are significant.

Furthermore, consumer awareness and education about waste management are insufficient, leading many to view waste disposal as a simple, insignificant task requiring little consideration. By raising awareness, communities will not only recognize the immediate benefits of properly sorting and disposing of their waste, such as reduced residuals, odors, and overall improved cleanliness, but they will also discover the advantages of composting for personal use. Composting practices can enrich soil quality for local gardening and agriculture, promoting self-sufficiency and fostering a stronger connection to environmental stewardship. Ultimately, this change may result in more sustainable living practices and healthier, greener communities.

Additionally, a new market for sustainable products can emerge, shifting consumer behavior away from disposable items. This change in consumer behavior is essential for creating a sustainable waste management system that starts with responsible consumption and

continues through to proper waste disposal., creating a complete shift on the current consumer behavior Chilean people have, where disposable, affordable products have their preference.

7.3 Bio-waste segregation

A feasible starting point requiring minimal financing is bio-waste segregation at the source. The "La Pintana" municipality exemplifies how community-level initiatives can change perceptions of waste. In this municipality, bio-waste is processed into compost and returned to residents for their use. However, if these types of initiatives are not feasible for municipalities due to contractual ties with waste service providers, the government could implement the advertisement of community-based initiatives led by the government that promote bio-waste handling within the local community. These initiatives could involve educational campaigns, workshops, and incentives to encourage residents to segregate bio-waste at the source. By leveraging government resources and authority, such campaigns could effectively raise awareness and instigate behavioral changes toward sustainable waste management practices at the grassroots level.

As a second step, a combination of waste collection methods could be implemented. This approach, with collection methods based on housing density and the type of recyclable waste, could be the most feasible and recommended scenario. Door-to-door collection, along with eco-islands (as seen in Slovenia), could effectively promote not only bio-waste separation but also packaging. While both steps require some level of funding, they offer a promising approach to improving waste management practices in Chile.

7.4 Landfill tax

Following Slovenia’s successful implementation of a landfill tax, Chile could adopt a similar approach to address the pressing issues surrounding its landfills, both legal and illegal. By imposing a landfill tax, the cost of waste disposal for companies and municipalities would rise, incentivizing the exploration of alternative waste management solutions. The revenue generated from this tax could then be reinvested into society, funding essential waste management infrastructure such as collection islands, door-to-door collection services, and nationwide awareness campaigns. This proactive measure not only tackles the immediate challenges posed by Chile’s landfill crisis but also paves the way for long-term sustainable waste management practices.

Unfortunately, things are made more difficult by Chile's market-driven economic structure. In a nation where private enterprises wield significant power, policies that may raise the operating expenses of enterprises are frequently met with fierce resistance. It can be difficult to implement efficient waste management solutions and conservation efforts when corporate interests are given precedence over environmental sustainability and public health due to this substantial political and economic leverage.

8 CONCLUSION

The initial efforts of this thesis focused on identifying international best practices to promote the advancement of the circular economy in Chile, however initial researched revealed that the nation's primary issue with the circular economy and envisioning a prosperous and sustainable future is waste management.

The research revealed several noteworthy challenges in Chile's current waste management system. Experts highlighted several key areas where Chile should focus to enhance its waste management efforts, including addressing illegal landfills, stricter law enforcement, introducing bio-waste and separated collection, and raising citizen’s awareness.

End-of-life disposal techniques is one of the most pressing issues on WM in Chile, which is emphasized by the short life of existing landfills and the difficult process of creating new ones, together with an increase in illegal landfills in order to cope with the amount of waste. Chile is facing the impending threat of waste saturation as these facilities get closer to capacity, which calls for immediate action to address the problem (MMA, 2022a). Findings from our third expert interview highlight how common illegal sanitary landfills are, which is especially concerning. These clandestine sites are seen as an essential starting point for resolving Chile's waste management crisis and present a significant barrier to efficient waste management efforts.

Waste management practices in Slovenia have emerged as an example of what initiatives could Chile adopt or draw inspiration from. Given the urgency of Chile's WM issues, Slovenia presents as an exemplary case study of a country that has improved the way waste is managed and achieved to include the citizens efforts, in a short timeframe. The country has undertaken substantial measures to not only meet but also exceed European standards, particularly in areas such as recycling rates and waste reduction targets. Slovenia's dedication to environmentally friendly waste management practices, exemplified by its pursuit of a zero-waste initiative, makes it a compelling case study for Chile as it tackles its own waste management challenges.

The research questions initially indicated in the introduction of this paper were clearly answered, and the objective of identifying Slovenia’s best practices on waste management to potentially adapt into Chile’s context discussed with experts from both countries in order to understand the potential of adopting initiatives like door-to-door collection, segregation of bio-waste, recycling islands and landfill tax, just like Slovenia did, into Chile’s context.

When considering the adaptation of international best practices to Chile's socio-economic context, experts expressed mixed opinions. While some advocated and expressed ease for the implementation of initiatives from countries like Slovenia, such as bio-waste separation and door-to-door collection, others highlighted significant barriers. Although these practices

could be readily implemented, experts from Chile noted the absence of citizen awareness, willingness, and commitment to such measures. The prevalent lack of engagement and awareness-raising efforts from local communities and government in Chile poses as a significant challenge to the successful nationwide adoption of these practices, and even though initiatives such as bio-waste separation or door-to-door collection could dramatically change the waste management landscape of Chile like it did to Slovenia, its implementation must be paired with citizen's engagement.

Chile has demonstrated a clear commitment to advancing the circular economy agenda through various laws, roadmaps, and initiatives, mirroring efforts seen in countries like Slovenia. However, enforcement is still a crucial issue that has to be looked into further. Putting in place strong enforcement mechanisms will be necessary to turn these initiatives into observable outcomes.

The issues with implementation and enforcement of laws, can be seen in laws such as the Extended Producer Responsibility law. This legislation places substantial new responsibilities on municipalities and companies to manage their products throughout their lifecycle. However, the complexity involved in its implementation and the engagement of all stakeholders present a notable challenge. This highlights the need for increased efforts and resources to ensure effective compliance and enforcement of such regulations, ultimately fostering a more sustainable approach to waste management in Chile.

To promote effective and proper waste management practices, there is a noticeable absence of awareness campaigns and efforts to keep citizens informed about the benefits of correct waste management. Additionally, citizen involvement is crucial when it comes to how laws are carried out and enforced, but it is sadly lacking because of general ignorance about the subject. All of our interviewees mentioned repeatedly concepts like awareness raising, culture, education, will and information, when talking about the fundamental role that citizens play in transitioning to a more sustainable future.

One of Slovenia's early initiatives was the adoption of the Landfill tax introduction in 2001 (EEA, 2013). To investigate potential legislative actions and the establishment of a landfill tax in Chile, more investigation is required. This includes identifying gaps and opportunities for introducing such a tax and assessing its potential economic impact on households and businesses. Considering that almost 80% of Chilean households do not currently pay taxes related to waste management services (Thiele, 2022), it is imperative to assess the viability and consequences of levying fees on citizens for the handling of waste. Chile can create a waste management system that is more efficient and sustainable by comprehending the effects that these possible policies will have on the country's economy, society, and environment, while reinvesting these taxes in infrastructure and further advances in waste management, as Slovenia did.

The incorporation of bio-waste initiatives, whether at the community level or as a nationwide application, was highlighted by interviewees from both Chile and Slovenia. They identified this as the crucial first step the country can take toward better waste management. Proper disposal of bio-waste offers numerous benefits, including composting and vermiculture, which can directly benefit communities. Additionally, it helps reduce odors and improve the overall cleanliness of waste disposal areas, becoming an initiative that could be easily implemented, with a not-significative investment for the municipality, like it was achieved in “La Pintana” municipality, and could be replicated in other areas.

Moreover, door-to-door collection, a measure also taken by Slovenia, that dramatically changed the way citizens manged their waste, arose as the next step governments can take towards better management of waste, however it was brought up by the first interviewee that many contractual ties for decades with waste services providers delay or block the municipality to generate any change, creating a blockage for any near-future projects for many municipalities in Chile.

Based on the conclusions drawn from our expert interviews, I have identified that the optimal complement for effective waste management entails: an informed and active community, source separation supported by municipalities & governmental bodies, selective collection, and valorization of waste resources.

In terms of waste management, Chile has advanced significantly, especially when taking into account its distinct and at times challenging political, economic, and social environment. The nation has demonstrated adaptability and resilience in the face of numerous difficulties. To create a waste management system that is both entirely sustainable and comprehensive, there is still a long way to go. All Chileans, from public officials to private citizens, should remain committed, engaged and actively participate in order for the country to progress toward an efficient waste management system. This entails enforcing laws and monitoring, raising public awareness, and encouraging community involvement—all essential measures that will lead to a more sustainable and clean future.

REFERENCE LIST

1. Albert, W., Tullis, T. S., & Tedesco, D. (2010). *Beyond the usability lab: Conducting large-scale online user experience studies*. Elsevier/Morgan Kaufmann. https://doi.org/10.1016/C2009-0-19827-6.

2. Amasuomo, E., & Baird, J. (2016). *The Concept of Waste and Waste Management. Journal of Management and Sustainability, 6(4), 88.* https://doi.org/10.5539/jms.v6n4p88.

3. Anderson, J. E. (2003). *Public policy making: An introduction (pp. 1-34). Houghton Mifflin*. https://www.kropfpolisci.com/public.policy.anderson.pdf

4. BCN. (2018). *Ley 21100. Prohíbe la entrega de bolsas plásticas de comercio en todo el territorio nacional*. Biblioteca del Congreso Nacional de Chile. https://www.bcn.cl/leychile/navegar?idNorma=1121380

5. BCN. (2021). *Ley 21368. Regula la entrega de plásticos de un solo uso y las botellas plásticas, y modifica los cuerpos legales que indica*. Biblioteca del Congreso Nacional de Chile. https://www.bcn.cl/leychile/navegar?idNorma=1163603

6. BCN. (2022). *Perfiles Comunales 2022. Caracterización de las Comunas de Chile*. Biblioteca del Congreso Nacional de Chile. https://obtienearchivo.bcn.cl/obtienearchivo?id=documentos/10221.1/87237/1/Perfiles_Comunales_Caracterizacion_Comunas_de_Chile-3.pdf.

7. BCN. (2022). *Gestión de residuos domiciliarios, Regulación en Chile*. Biblioteca del Congreso Nacional de Chile. https://obtienearchivo.bcn.cl/obtienearchivo?id=repositorio/10221/33229/1/BCN_Gestion_de_residuos_domiciliarios_Chile_2022_FINAL.pdf

8. Bhutani, A., & Siegner, M. (2023). *Opening remarks on International best practices on circular economy roadmaps*. The Case of Vietnam. https://www.circularinnovationlab.com/post/international-best-practices-on-circular-economy-roadmaps-the-case-of-vietnam.

9. Bidlingmaier, W., Sidaine, J.-M., & Papadimitriou, E. K. (2004). *Separate Collection and Biological Waste Treatment in the European Community*. Reviews in Environmental Science and Bio/Technology, *3(4)*, 307–320. https://doi.org/10.1007/s11157-004-2334-1.

10. Blake, O., Glaser, M., Bertolini, L., & Te Brömmelstroet, M. (2021). *How policies become best practices: A case study of best practice making in an EU knowledge sharing*

project. European Planning Studies, *29(7)*, 1251–1271. https://doi.org/10.1080/09654313.2020.1840523.

11. Bulkeley, H., & Gregson, N. (2009). *Crossing the Threshold: Municipal Waste Policy and Household Waste Generation*. Environment and Planning A: Economy and Space, *41(4)*, 929–945. https://doi.org/10.1068/a40261.

12. Chatham House. (2019). An Inclusive Circular Economy: Priorities for Developing Countries. https://www.chathamhouse.org/2019/05/inclusive-circular-economy/2-challenges-scaling-circular-economy-developing-countries.

13. Chatham House. (2022). *A global roadmap for an inclusive circular economy*. https://circulareconomy.earth/publications/a-global-roadmap-for-an-inclusive-circular-economy.

14. Chile sin Basura. (2021). *Conoce la nueva Estrategia Nacional de Residuos Orgánicos del Ministerio de Medio Ambiente*. https://chilesinbasura.cl/estrategia-nacional-de-residuos-organicos/

15. Chocola, M. (2024). *All about landfills: Uses, types, and more*. HWH Environmental. https://www.hwhenvironmental.com/landfills-101/

16. Climtae-ADAPT. (2023). *Awareness raising campaigns for stakeholders' behavioural change*. https://climate-adapt.eea.europa.eu/en/metadata/adaptation-options/awareness-campaigns-for-behavioural-change#:~:text=Awareness%20campaigns%20are%20considered%20more,of%20informal%20networks%20for%20information

17. D'Adamo, I., Mazzanti, M., Morone, P., & Rosa, P. (2022). *Assessing the Relation between Waste Management Policies and Circular Economy Goals*. Waste Management, *154*, 27–35. https://doi.org/10.1016/j.wasman.2022.09.031.

18. Dahlén, L., Vukicevic, S., Meijer, J.-E., & Lagerkvist, A. (2007). *Comparison of Different Collection Systems for Sorted Household Waste in Sweden*. Waste Management, *27(10)*, 1298–1305. https://doi.org/10.1016/j.wasman.2006.06.016.

19. Davies, B., & Doable, M. (2004). *The development and implementation of a landfill tax in the UK*. In OECD. *Addressing the Economics of Waste*. Paris, OECD. https://books.google.si/books?hl=en&lr=&id=GmbWAgAAQBAJ&oi=fnd&pg=PA63&ots=Ag7EJqY9_2&sig=IqXFs7hUAD3kll3uw91qzLnOJLc&redir_esc=y#v=onepage&q&f=false

20. Defra. (2013). *Waste management plan for England*. Department for Environment, Food & Rural Affairs.

https://assets.publishing.service.gov.uk/media/5a7c3b1140f0b674ed20fb5c/pb14100-waste-management-plan-20131213.pdf.

21. De la Fuente, H. D. (2023). *La gestión de la basura en Chile*. https://www.ingenieros.cl/la-gestion-de-la-basura-en-chile/.

22. Den Hollander, M. C., Bakker, C. A., & Hultink, E. J. (2017). *Product Design in a Circular Economy: Development of a Typology of Key Concepts and Terms*. Journal of Industrial Ecology, *21(3)*, 517–525. https://doi.org/10.1111/jiec.12610.

23. DLL. (2015). *Realizing opportunities of a circular business model*. De Lage Landen International. https://www.dllgroup.com/en/resources/~/media/Project/Dll/Global/Documents/Whitepapers%20and%20reports/realizingopportunitiesofacircularbusinessmodelEN012RGB.pdf.

24. EBRD. (n.d). *Zero-waste strategy: Ljubljana, Slovenia*. European Bank for Reconstruction and Development. https://www.ebrdgreencities.com/policy-tool/zero-waste-strategy-ljubljana-slovenia/

25. EEA. (2013). *Municipal waste management in Slovenia*. European Environmental Agency. file:///Users/franciscaflais/Downloads/Slovenia_MSW%20(9).pdf

26. EEA. (2018). *Waste prevention in Europe — policies, status and trends in reuse in 2017*. European Environmental Agency. https://www.eea.europa.eu//publications/waste-prevention-in-europe-2017

27. EEA. (2022). *Circular economy country profile – Slovenia*. European Environment Agency. https://www.eionet.europa.eu/etcs/etc-ce/products/etc-ce-products/etc-ce-report-5-2022-country-profiles-on-circular-economy/slovenia-ce-country-profile-2022_for-publication.pdf

28. EEA. (2023). *Waste and recycling*. European Environmental Agency. https://www.eea.europa.eu/en/topics/in-depth/waste-and-recycling?activeAccordion=98a3fcf3-da52-4b7d-9e6e-3976612a0613

29. EEA. (2024). *Diversion of waste from landfill in Europe*. European Environmental Agency. https://www.eea.europa.eu/en/analysis/indicators/diversion-of-waste-from-landfill

30. EEB. (n.d.). *Explained: Europe's new laws for the separate collection of waste*. European Environmental Bureau. https://eeb.org/wp-content/uploads/2020/03/Separate-collection-factsheet.pdf

31. EESC. (2019). *Circular economy strategies and roadmaps in Europe: identifying synergies and the potential for cooperation and alliance building: Final report.* Publications Office. European Economic and Social Committee. https://data.europa.eu/doi/10.2864/886410

32. Ellen MacArthur Foundation. (n.d.a). *What is a circular economy?* https://www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview#:~:text=We%20must%20transform%20every%20element,the%20limits%20of%20our%20planet.

33. Ellen MacArthur Foundation. (n.d.b). *The butterfly diagram: visualising the circular economy*. https://www.ellenmacarthurfoundation.org/circular-economy-diagram

34. Ellen MacArthur Foundation. (2013). *Towards the circular economy Vol. 1: an economic and business rationale for an accelerated transition*. https://www.ellenmacarthurfoundation.org/towards-the-circular-economy-vol-1-an-economic-and-business-rationale-for-an

35. Ellen MacArthur Foundation. (2022a). *The technical cycle of the butterfly diagram.* https://www.ellenmacarthurfoundation.org/articles/the-technical-cycle-of-the-butterfly-diagram

36. Ellen MacArthur Foundation. (2022b). *The biological cycle of the butterfly diagram.* https://www.ellenmacarthurfoundation.org/articles/the-biological-cycle-of-the-butterfly-diagram

37. EPA. (2020). *Best Practices for Solid Waste Management: A Guide for Decision-Makers in Developing Countries*. Environmental Protection Agency. https://www.iges.or.jp/en/publication_documents/pub/policyreport/en/11066/Best+Practices+for+SWM_Guide+for+Decision+Makers+in+Developing+Countries_Oct+20_0.pdf

38. EPA. (2024). *Basic Information about Landfills*. Environmental Protection Agency. https://www.epa.gov/landfills/basic-information-about-landfills

39. European Commission. (2015). *Closing the loop - An EU action plan for the Circular Economy*. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0614&from=ES

40. European Commission. (2017). *Waste: Commission refers Slovenia to the Court of Justice over illegal landfills*. https://ec.europa.eu/commission/presscorner/detail/PT/IP_17_1048

41. European Commission. (2020). *Circular economy action plan: For a cleaner and more competitive Europe*. https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

42. European Commission. (2024). *Directive 2008/98/EC of the European Parliament and of the Council*. The waste framework directive 2008/98/EC. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008L0098

43. European Parliament. (2023). *Circular economy: definition, importance and benefits*. https://www.europarl.europa.eu/topics/en/article/20151201STO05603/circular-economy-definition-importance-and-benefits

44. European Parliament. (2024). *Sustainable waste management: What the EU is doing.* European Parliament News. https://www.europarl.europa.eu/topics/en/article/20180328STO00751/sustainable-waste-management-what-the-eu-is-doing#:~:text=In%20February%202021%2C%20the%20Parliament,materials%20use%20and%20consumption%20by

45. European Union. (n.d.). *Council Directive 75/442/EEC of 15 July 1975 on waste*. EUR-Lex. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31975L0442

46. Eurostat. (n.d.). *Circular Economy*. Database. https://ec.europa.eu/eurostat/web/circular-economy/database

47. Eurostat. (2023). *Glossary: Landfill*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Landfill

48. Eurostat. (2024). *Generation of municipal waste per capita [dataset]*. Eurostat. https://doi.org/10.2908/CEI_PC031

49. Evreka. (2024). *Door-to-door waste collection*. Evreka. https://evreka.co/use-cases/door-to-door-collection/

50. Ferronato, N., & Torretta, V. (2019). *Waste Mismanagement in Developing Countries: A Review of Global Issues.* International Journal of Environmental Research and Public Health, *16(6)*, 1060. https://doi.org/10.3390/ijerph16061060

51. Forster, J. J. (2001). *Sample Surveys: Nonprobability Sampling*. In International Encyclopedia of the Social & Behavioral Sciences (pp. 13467–70). Elsevier. https://doi.org/10.1016/B0-08-043076-7/00499-X

52. Gellynck, X., Jacobsen, R., & Verhelst, P. (2011). *Identifying the Key Factors in Increasing Recycling and Reducing Residual Household Waste: A Case Study of the*

Flemish Region of Belgium. Journal of Environmental Management, 92(10), 2683–2690. https://doi.org/10.1016/j.jenvman.2011.06.006

53. GfK. (2022). *Estudio Reciclando-ando*. https://fch.cl/wp-content/uploads/2022/11/GfK_FCH_Estudio-Reciclando-ando-2022_VF.pdf

54. 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. https://doi.org/10.1016/j.jclepro.2015.09.007

55. Godfrey, L. (2021). *Waste Management Practices in Developing Countries*. Recycling. https://core.ac.uk/download/pdf/520258682.pdf

56. Gómez Cuta, C. (2023). *Chile is Leading the Way as an Example of a Regional Circular Economy*. Circular Innovation Lab. https://www.circularinnovationlab.com/post/chile-is-leading-the-way-as-an-example-of-a-regional-circular-economy

57. Graneheim, U. H., Lindgren, B.-M., & Lundman, B. (2017). *Methodological challenges in qualitative content analysis: A discussion paper*. Nurse Education Today, 56, 29–34. https://doi.org/10.1016/j.nedt.2017.06.002

58. Gray, P. S. (2007). The research imagination: An introduction to qualitative and quantitative methods. Cambridge University Press. https://doi.org/10.1017/CBO9780511819391

59. Hao, M., & Xu, S. (2023). *The Impact of Penalty on Residents' Waste Separation Behavior: A Moderated Mediation Model*. Polish Journal of Environmental Studies, *32(2)*, 1145–1158. https://doi.org/10.15244/pjoes/156789.

60. HCH. (2021). *Waste Management in the LATAM region*. Waste management country report: Chile. Holland Circular Hotspot. https://hollandcircularhotspot.nl/wp-content/uploads/2021/04/Report_Waste_Management_Chile_20210322.pdf.

61. Hong, G. H., El Hady, B., Joo, K. D., & Shin, D. (2012). *Characterization of moisture and free air space effects and the optimal operation of a composting process for minimal waste and energy use*. In Computer Aided Chemical Engineering (*Vol. 31*, pp. 500–504). Elsevier. https://doi.org/10.1016/B978-0-444-59507-2.50092-5

62. IMF. (2024). *Making Chile's Economy More Dynamic, Greener, and Inclusive.* International Monetary Fund. https://www.imf.org/en/News/Articles/2024/02/15/cf-making-chiles-economy-more-dynamic-greener-and-inclusive#:~:text=Chile's%20economy%20is%20at%20a,response%20to%20discontent%20over%20inequality.

63. Induambiente. (2024). *Recolección puerta a puerta de envases y embalajes llegaría este año a 48 comunas del país. Induambiente*. https://www.induambiente.com/recoleccion-puerta-a-puerta-de-envases-y-embalajes-llegaria-este-ano-a-48-comunas-del-pais.

64. InforMEA. (n.d). *Waste Management*. https://www.informea.org/en/terms/waste-management

65. Izdebska, O., & Knieling, J. (2020). *Citizen involvement in waste management and circular economy in cities: Key elements for planning and implementation*. European Spatial Research and Policy, *27(2),* 115–129. https://doi.org/10.18778/1231-1952.27.2.08

66. JASPERS. (2022). *Developing Circular Economy Strategies in Europe Best practices.* JASPERS Circular Economy Team. https://jaspers.eib.org/knowledge/publications/best-practices-in-developing-circular-economy-strategies-in-europe

67. JWN. (2018). *Waste Management in Japan, Rules and Figures*. Japan Waste Network. https://www.jwnet.or.jp/assets/pdf/en/20190322133536.pdf

68. Kanatas, P. (2023). *The importance of investing in modern waste infrastructure: A path towards sustainable development*. Allied Academies. https://www.alliedacademies.org/articles/the-importance-of-investing-in-modern-waste-infrastructure-a-path-towards-sustainable-development.pdf

69. Karimi, N. (2023). *Assessing global waste management: Alternatives to landfilling in different waste streams—a scoping review*. Sustainability, *15(18),* 13290. https://doi.org/10.3390/su151813290

70. Kaza, S., Yao, L. C., Bhada-Tata, P., & Van Woerden, F. (2018). *What a waste 2.0: A global snapshot of solid waste management to 2050*. Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-1329-0

71. Keuc, A. (2002). *Waste management in Slovenia: Assessment of the implementation of waste legislation and attainment of strategic objectives: a summary*. Umanotera, The Slovenian Foundation for Sustainable Development.

72. Kibria, Md. G., Masuk, N. I., Safayet, R., Nguyen, H. Q., & Mourshed, M. (2023). *Plastic Waste: Challenges and Opportunities to Mitigate Pollution and Effective Management.* International Journal of Environmental Research, *17(1),* 20. https://doi.org/10.1007/s41742-023-00507-z

73. Kirchherr, J., Hekkert, M., Bour, R., Huijbrechtse-Truijens, A., Kostense-Smit, E., & Muller, J. (2017). *Breaking the Barriers to the Circular Economy*. https://circulareconomy.europa.eu/platform/sites/default/files/171106_white_paper_breaking_the_barriers_to_the_circular_economy_white_paper_vweb-14021.pdf

74. Kirchherr, J., Piscicelli, L., Bour, R., Kostense-Smit, E., Muller, J., Huibrechtse-Truijens, A., & Hekkert, M. (2018). *Barriers to the circular economy: Evidence from the European Union (EU)*. Ecological Economics, *150*, 264-272. https://doi.org/10.1016/j.ecolecon.2018.04.028

75. Kirchherr, J., Reike, D., & Hekkert, M. (2017). *Conceptualizing the circular economy: An analysis of 114 definitions*. Resources, Conservation and Recycling, *127*, 221-232. https://doi.org/10.1016/j.resconrec.2017.09.005

76. Kirkman, R., & Voulvoulis, N. (2017). *The role of public communication in decision making for waste management infrastructure*. Journal of Environmental Management, *203*, 640-647. https://doi.org/10.1016/j.jenvman.2016.06.002

77. La Tercera. (2019). *La preocupante situación de los vertederos en Chile: 43 ya cumplieron su vida útil*. https://www.latercera.com/nacional/noticia/la-preocupante-situacion-los-vertederos-chile-43-ya-cumplieron-vida-util/618335/#

78. Law Insider. (n.d.). *Door-to-Door Garbage Collection*. https://www.lawinsider.com/dictionary/door-to-door-garbage-collection

79. Malek, W., Mortazavi, R., Cialani, C., & Nordström, J. (2023). *How have waste management policies impacted the flow of municipal waste? An empirical analysis of 14 European countries*. Waste Management, *164*, 84–93. https://doi.org/10.1016/j.wasman.2023.03.040.

80. Manning, J. (2017). *In vivo coding*. The International Encyclopedia of Communication Research Methods (*1st ed.*, pp. 1-2). Wiley. https://doi.org/10.1002/9781118901731.iecrm0270

81. Margaret Popoola, B. (2023). *Biodegradable Waste*. In H. M. Saleh & A. I. Hassan (Eds.), Recycling Strategy and Challenges Associated with Waste Management Towards Sustaining the World. IntechOpen. https://doi.org/10.5772/intechopen.107910

82. Marra, A., Mazzocchitti, M., & Sarra, A. (2018). *Knowledge sharing and scientific cooperation in the design of research-based policies: The case of the circular economy. Journal of Cleaner Production, 194*, 800–812. https://doi.org/10.1016/j.jclepro.2018.05.164

83. Marti, L., & Puertas, R. (2021). *Influence of environmental policies on waste treatment. Waste Management, 126*, 191–200. https://doi.org/10.1016/j.wasman.2021.03.009

84. Martin, A., & Scott, I. (2003). *The effectiveness of the UK landfill tax*. *Journal of Environmental Planning and Management, 46*(5), 673–689. https://doi.org/10.1080/0964056032000138436.

85. Martin, M., Williams, I. D., & Clark, M. (2006). *Social, cultural and structural influences on household waste recycling: A case study*. Resources, Conservation and Recycling, 48(4), 357-395. https://doi.org/10.1016/j.resconrec.2005.09.005

86. Martínez, L. (2023). *La revolución circular, El Mercurio*. [Interview]. https://cdn.pefc.org/pefc.cl/media/2023-09/9d285c7e-3954-442e-bff6-df758e0a02e9/35ee5bc9-376a-58aa-befa-0d583634d39e.pdf

87. Mazzanti, M., Montini, A., & Nicolli, F. (2012). *Waste Dynamics in Economic and Policy Transitions: Decoupling, Convergence and Spatial Effects*. Journal of Environmental Planning and Management, *55(5),* 563–581. https://doi.org/10.1080/09640568.2011.616582

88. Meidiana, C., Sekito, T., & Sasongko, W. (2021). *Determining factors of community participation in waste bank*. IOP Conference Series: Earth and Environmental Science, *940(1),* 012085. https://doi.org/10.1088/1755-1315/940/1/012085

89. Meijer, Lourens J. J., Tim Van Emmerik, Ruud Van Der Ent, Christian Schmidt, and Laurent Lebreton. (2021). *More than 1000 Rivers Account for 80% of Global Riverine Plastic Emissions into the Ocean*. *Science Advances 7(18).* https://www.researchgate.net/publication/351269287_More_than_1000_rivers_account_for_80_of_global_riverine_plastic_emissions_into_the_ocean

90. Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M. H., & Ometto, A. R. (2017). *From linear to circular economy: PSS conducting the transition*. *Procedia CIRP, 64*, 2–6. https://doi.org/10.1016/j.procir.2017.03.012

91. Ministerio de Energía. (2014). *Energía 2050, Política energética de Chile*. https://www.energia.gob.cl/sites/default/files/energia_2050_-_politica_energetica_de_chile.pdf

92. Ministerio de Hacienda. (n.d). *What initiatives does Chile promote towards sustainable development, in addition to sustainable bonds?* https://www.hacienda.cl/english/work-areas/international-finance/public-debt-office/frequently-asked-questions/sustainable-bonds/what-initiatives-does-chile-promote-towards-sustainable-development-in-addition

93. MMA. (n.d.). *Ley marco 20.920 para la gestión de residuos*. Ministerio del Medio Ambiente, Santiago. https://economiacircular.mma.gob.cl/ley-rep/

94. MMA. (2020). *Preguntas frecuentes-Ley REP*. Ministerio del medio ambiente, Santiago. https://economiacircular.mma.gob.cl/wp-content/uploads/2020/07/Preguntas-Frecuentes-Ley-REP.pdf

95. MMA. (2022a). *A roadmap for a circular Chile by 2040* [Brochure]. Ministerio del medio ambiente, Santiago. https://economiacircular.mma.gob.cl/wp-content/uploads/2022/01/HOJA-DE-RUTA-PARA-UN-CHILE-CIRCULAR-AL-2040-EN.pdf

96. MMA. (2022b). *National organic waste strategy Chile 2040*. Ministerio del medio ambiente, Santiago. https://economiacircular.mma.gob.cl/wp-content/uploads/2022/03/Estrategia-Nacional-Residuos-Organicos-Ingles.pdf

97. Ministry of the Environment. (2024). *Basic Act for Establishing a Sound Material-Cycle Society*. https://www.env.go.jp/recycle/circul/recycle.html

98. Ministry of the Environment, Climate and Energy. (2023). *Waste Management*. https://www.gov.si/en/topics/waste-management/

99. Ministry of Justice of Japan. (2000). *Basic Act on Establishing a Sound Material-Cycle Society Act No. 110 of June 2, 2000*. https://www.japaneselawtranslation.go.jp/en/laws/view/3799/en#:~:text=Article%204The%20establishment%20of,appropriately%20and%20fairly%20among%20them.

100. Möslinger, M., Ulpiani, G., & Vetters, N. (2023). *Circular economy and waste management to empower a climate-neutral urban future*. Journal of Cleaner Production, *421*, 138454. https://doi.org/10.1016/j.jclepro.2023.138454

101. Namlis, K.-G., & Komilis, D. (2019). *Influence of four socioeconomic indices and the impact of economic crisis on solid waste generation in Europe*. Waste Management, 89, 190-200. https://doi.org/10.1016/j.wasman.2019.04.012

102. Oblak, E. (2015). *The story of Ljubljana*. Zero Waste Europe 2015. https://zerowasteeurope.eu/wp-content/uploads/edd/2017/12/CS5-LJUBLJANA-EN.pdf

103. Oblak, E. (2019). *Zero Waste Europe*. The story of Ljubljana, case study. https://zerowasteeurope.eu/wp-content/uploads/2019/10/zero_waste_europe_cs5_ljubljana_en.pdf

104. O.P. JINDAL GLOBAL UNIVERSITY. (2023, December 30). *Public Policy: Meaning, Scope, Features, Types, Importance & More*. JGU. https://jgu.edu.in/blog/2023/12/30/what-is-public-policy/

105. OECD. (2014). *Policy dialogue, knowledge sharing and engaging in mutual learning.* https://www.oecd.org/knowledge-sharing-alliance/OECD-Post-2015_Policy-Dialogue-Knowledge-Sharing-and-Engaging-in-mutual-learning.pdf

106. OECD. (2020). *Smart City Data Governance: Challenges and the Way Forward. OECD Urban Studies*. https://doi.org/10.1787/e57ce301-en

107. OECD. (2022). *Green Economy Transition in Eastern Europe, the Caucasus and Central Asia: Progress and Ways Forward*. https://doi.org/10.1787/c410b82a-en

108. OECD. (2022). *The OECD RE-CIRCLE project: The economics of the transition to a more resource-efficient, circular economy*. https://www.oecd.org/env/waste/Policy-Perspectives-The-economics-of-the-transition-to-a-more-resource-efficient-circular-economy.pdf

109. OECD. (2023). *Circular economy - waste and materials*. In *Environment at a Glance Indicators*. OECD Publishing, Paris. https://doi.org/10.1787/f5670a8d-en.

110. OECD. (n.d.). *Environmental Indicators. Country Profiles > Japan*. https://www.oecd.org/site/envind/japan.htm

111. Ossio, F., & Faúndez Riquelme, J. (2021). *Diagnóstico Nacional de Sitios de Disposición Ilegal de Residuos.* https://www.researchgate.net/publication/348443724_Diagnostico_Nacional_de_Sitios_de_Disposicion_Ilegal_de_Residuos/citations

112. Owens, S., & Driffill, L. (December 2008). *How to Change Attitudes and Behaviours in the Context of Energy*. *Energy Policy, 36(12),* 4412–4418. https://doi.org/10.1016/j.enpol.2008.09.031.

113. Pacheco-Vega, R. (2020). *Environmental regulation, governance, and policy instruments, 20 years after the stick, carrot, and sermon typology*. *Journal of Environmental Policy & Planning, 22(5),* 620–635. https://doi.org/10.1080/1523908X.2020.1792862.

114. Paoletti, D. (2023). *Importance of Effective Waste Management for a Sustainable Future.* LinkedIn. https://www.linkedin.com/pulse/importance-effective-waste-management-sustainable-future-paoletti/.

115. País Circular. (2023). *Las oportunidades y desafíos que traerá una ley sobre valorización de residuos orgánicos.* https://www.paiscircular.cl/economia-circular/las-oportunidades-y-desafios-que-traeria-una-ley-sobre-valorizacion-de-residuos-organicos/

116. Pacto Chileno de los plásticos. (2020). *Hoja de ruta: Pacto Chileno de los plásticos*. Fundación Chile. Ministerio del Medio Ambiente & Plastic Pacts. https://fch.cl/wp-content/uploads/2020/01/roadmap-pacto-chileno-de-los-plasticos.pdf

117. Papamichael, I., Chatziparaskeva, G., Voukkali, I., Navarro Pedreno, J., Jeguirim, M., & Zorpas, A. A. (2023). *The perception of circular economy in the framework of fashion industry*. Waste Management & Research: The Journal for a Sustainable Circular Economy, *41(2)*, 251–263. https://doi.org/10.1177/0734242X221126435.

118. Park, C. (2007). *A dictionary of environment and conservation* (1st ed.). Oxford University Press. https://doi.org/10.1093/acref/9780198609957.001.0001.

119. Petrova, V. (2023). *The impact of the industrial revolutions in the transition from linear to circular economy*. https://doi.org/10.5281/ZENODO.8339129

120. Petts, J. (2004). *Barriers to participation and deliberation in risk decisions: Evidence from waste management*. Journal of Risk Research, *7(2)*, 115–133. https://doi.org/10.1080/1366987042000158695

121. Pires, A., & Martinho, G. (2019). *Waste hierarchy index for circular economy in waste management*. Waste Management, *95*, 298–305. https://doi.org/10.1016/j.wasman.2019.06.014

122. Richards, L., & Morse, J. M. (2013). *Readme first for a user's guide to qualitative methods. (3rd ed).* Sage. https://books.google.si/books?id=MYsgAQAAQBAJ&lpg=PP1&ots=cEb21KpiAr&dq=Richards%20%26amp%3B%20Morse%2C%202007%2C%20p.%20137).&lr&pg=PP1#v=onepage&q=Richards%20&%20Morse,%202007,%20p.%20137).&f=false

123. Santosh, G. (2024). *A Circular Future: Unveiling the EU's Historic Waste Policy Overhaul. Sustainomics.* https://www.linkedin.com/pulse/circular-future-unveiling-eus-historic-waste-policy-overhaul-g-99snc/

124. Saidani, M., Yannou, B., Leroy, Y., Cluzel, F., & Kendall, A. (2019). *A taxonomy of circular economy indicators*. Journal of Cleaner Production, *207*, 542–559. https://doi.org/10.1016/j.jclepro.2018.10.014

125. Schröder, P., & Barrie, J. (2022). *A global roadmap for an inclusive circular economy*. https://static.resourcetrade.earth/2022-05-23-stockholm50-circular-economy-roadmap-FINAL.pdf

126. SDG Watch Europe. (2020). *SDG 12: Responsible consumption and production - Progress report.* https://www.sdgwatcheurope.org/wp-content/uploads/2020/09/SDG-12-Progress-report.pdf

127. Soo, V. K., Compston, P., & Doolan, M. (2019). *Life cycle modeling of end-of-life products: Challenges and opportunities towards a circular economy*. Procedia CIRP, *80*, 607–612. https://doi.org/10.1016/j.procir.2019.01.092

128. Statista. (2022). *Per capita waste sent to landfills worldwide as of 2022, by select country (in kilograms)*. https://www.statista.com/statistics/691818/leading-countries-by-per-capita-generated-landfilll-waste/

129. Statista. (2023). *Municipal solid waste recycling rates in selected countries worldwide in 2021*. https://www.statista.com/statistics/1052439/rate-of-msw-recycling-worldwide-by-key-country/

130. Stead, D. (2012). *Best Practices and Policy Transfer in Spatial Planning*. Planning Practice and Research, *27(1),* 103–116. https://doi.org/10.1080/02697459.2011.644084

131. SNAGA. (2019). *Ljubljana Regional Waste Management Centre*. Javno podjetje vodovod kanalizacija snaga. https://www.vokasnaga.si/en/Regional%20Waste%20Management%20Centre

132. SNAGA. (2021). *Price, billing and payment for municipal waste management services.* Javno podjetje vodovod kanalizacija snaga. https://www.vokasnaga.si/odpadki/pogosta-vprasanja/cena-obracun-placevanje

133. SNAGA. (n.d.). *Separating waste*. Javno podjetje vodovod kanalizacija snaga. https://www.vokasnaga.si/en/separating%20waste

134. SPOT. (2023). *Waste collection*. Republic of Slovenia. Slovenian business Point. https://spot.gov.si/en/activities-and-professions/activities/waste-collection/

135. Sres, K. (2020). *Chasing zero waste: How Slovenia has become a European frontrunner of the zero waste cities movement*. https://zerowastecities.eu/chasing-zero-waste-how-slovenia-has-become-a-european-frontrunner-of-the-zero-waste-cities-movement/

136. Stone, D. (2012). *Transfer and translation of policy*. Policy Studies, *33(6),* 483–499. https://doi.org/10.1080/01442872.2012.695933

137. Su, B., Heshmati, A., Geng, Y., & Yu, X. (2013). *A review of the circular economy in China: Moving from rhetoric to implementation*. Journal of Cleaner Production, *42*, 215–227. https://doi.org/10.1016/j.jclepro.2012.11.020.

138. Sumrin, S., Gupta, S., Asaad, Y., Wang, Y., Bhattacharya, S., & Foroudi, P. (2021). *Eco-innovation for environment and waste prevention*. Journal of Business Research, *122*, 627–639. https://doi.org/10.1016/j.jbusres.2020.08.001

139. SURS. (2018). *Seventeen operating landfill sites in Slovenia in 2016*. Republic of Slovenia Statistical Office, Infrastructure for waste management, Slovenia. https://www.stat.si/Statweb/En/News/Index/7501

140. SURS. (2022). *Waste indicators, 2022*. The least waste (excluding major mineral wastes) per capita generated so far. Republic of Slovenia Statistical Office. https://www.stat.si/StatWeb/en/News/Index/11481

141. SURS. (2023). *The least waste (excluding major mineral wastes) per capita generated so far*. Republic of Slovenia Statistical Office. https://www.stat.si/StatWeb/en/News/Index/11481

142. SURS. (2024). *Municipal waste generated [Kg/capita]*. Republic of Slovenia Statistical Office. https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/2700001S.px

143. SL Recycling. (2023). *What are the Negative Effects of Landfill?* Republic of Slovenia Statistical Office. https://www.slrecyclingltd.co.uk/what-are-the-negative-effects-of-landfill/

144. Treacy, J. (2023). *Policy Implementation on Waste Management and Achievement of Related SDGs*. SDGs in the European Region (pp. 1–29). Springer International Publishing. https://doi.org/10.1007/978-3-030-91261-1_35-1

145. Thiele, M. (2022). *"¡El que contamina, paga!" ... pero no todos*. https://www.paiscircular.cl/opinion/el-que-contamina-paga-pero-no-todos/

146. Transforma alimentos. (n.d.). *ASIPLA y sus desafíos como gremio frente a la Ley REP*. https://transformaalimentos.cl/2023/03/21/asipla-y-sus-desafios-como-gremio-frente-a-la-ley-rep/

147. Trošt, T. (2022). *Collecting qualitative data*. [Lesson material]. Ljubljana: The Faculty of Economics, University of Ljubljana. https://felu.instructure.com/courses/2128/files/237195?module_item_id=46764

148. Trang, P. T. T., Dong, H. Q., Toan, D. Q., Hanh, N. T. X., & Thu, N. T. (2017). *The effects of socio-economic factors on household solid waste generation and composition: A case study in Thu Dau Mot, Vietnam.* Energy Procedia, 107, 253–258. https://doi.org/10.1016/j.egypro.2016.12.144.

149. UN. (2013). *Guidelines for national waste management strategies: moving from challenges to opportunities*. [Report]. United Nations. https://www.unep.org/resources/report/guidelines-national-waste-management-strategies-moving-challenges-opportunities

150. UN. (2015). *The 17 goals*. United Nations. https://sdgs.un.org/goals

151. UNDP. (2023). *What is circular economy and why does it matter? Climate Promise.* United Nations Development Programme. https://climatepromise.undp.org/news-and-stories/what-is-circular-economy-and-how-it-helps-fight-climate-change

152. UNEP & ISWA. (2024). *Global Waste Management Outlook 2024 - Beyond an age of waste: Turning rubbish into a resource*. United Nations Environment Programme & International Solid Waste Association. https://doi.org/10.59117/20.500.11822/44939

153. US-EPA. (2023). *The Solid Waste Management Toolkit for Developing Countries*. United States Environmental Protection Agency. https://www.epa.gov/international-cooperation/solid-waste-management-toolkit-developing-countries

154. USS. (2024). *El rol crucial de los municipios para la implementación de la Ley REP*. Universidad San Sebastián. https://www.uss.cl/noticias/municipios-implementacion-ley-rep/

155. Van Audenhove, L., & Donders, K. (2019). *Talking to People III: Expert Interviews and Elite Interviews*. In H. Van Den Bulck, M. Puppis, K. Donders, & L. Van Audenhove (Eds.), The Palgrave Handbook of Methods for Media Policy Research (pp. 179–197). Springer International Publishing. https://doi.org/10.1007/978-3-030-16065-4_10

156. Vaverková. (2019). *Landfill impacts on the environment—Review*. Geosciences, *9(10)*, 431. https://doi.org/10.3390/geosciences9100431.

157. Verhoef, M. J., & Casebeer, A. L. (1997). *Broadening Horizons: Integrating Quantitative and Qualitative Research*. Canadian Journal of Infectious Diseases, *8(2)*, 65–66. https://doi.org/10.1155/1997/349145

158. Vettoretto, L. (2009). *A Preliminary Critique of the Best and Good Practices Approach in European Spatial Planning and Policy-making*. European Planning Studies, *17(7)*, 1067–1083. https://doi.org/10.1080/09654310902949620

159. Wang, Z., Dong, X., & Yin, J. (2018). *Antecedents of urban residents' separate collection intentions for household solid waste and their willingness to pay: Evidence from China*. *Journal of Cleaner Production, 173*, 256–264. https://doi.org/10.1016/j.jclepro.2016.09.223.

160. WBCSD. (2019). *Policy enablers to accelerate the circular economy: Scaling up actions across regions and stakeholders*. https://circulareconomy.europa.eu/platform/sites/default/files/wbcsd_policy_enablers_to_accelerate_the_circular_economy.pdf

161. WCEF. (2023). *The story so far*. World Circular Economy Forum. https://wcef2024.com/about-us/wcef-the-story-so-far/

162. White, P. R., Franke, M., & Hindle, P. (1995). *Integrated Solid Waste Management: A Lifecycle Inventory*. Springer Science & Business Media. https://doi.org/10.1007/978-1-4615-2369-7

163. Wilson, D. C., Smith, N. A., Blakey, N. C., & Shaxson, L. (2007). *Using research-based knowledge to underpin waste and resources policy*. Waste Management & Research: The Journal for a Sustainable Circular Economy, *25(3),* 247–256. https://doi.org/10.1177/0734242X07079154

164. Wilts, H. (2017). *Key challenges for transformations towards a circular economy – The status quo in Germany*. International Journal of Waste Resources, *07(01).* https://doi.org/10.4172/2252-5211.1000262.

165. World Bank. (2021, July 26). *More growth, less garbage*. The World Bank. https://www.worldbank.org/en/topic/urbandevelopment/publication/more-growth-less-garbage#:~:text=Currently%2C%20the%20trajectory%20for%20global,3.88%20billion%20tonnes%20by%202050.

166. World Economic Forum. (2014). *Towards the Circular Economy: Accelerating the scale-up across global supply chains*. https://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf

167. Yajnik, C. (2024). *The role of government policies in shaping effective solid waste management systems*. https://www.linkedin.com/pulse/role-government-policies-shapingeffective-solid-waste-chinmay-yajnik-hymef/

168. Yalçın, N. G., & Foxon, T. J. (2021). *A systemic approach to transitions towards circular economy: The case of Brighton and Hove*. Cleaner Environmental Systems, 3, 100038. https://doi.org/10.1016/j.cesys.2021.100038.

169. Zorpas, A. A. (2020). *Strategy development in the framework of waste management.* Science of The Total Environment, *716*, 137088. https://doi.org/10.1016/j.scitotenv.2020.137088.

APPENDICES

Appendix 1: Povzetek (Summary in Slovene language)

Industrijska revolucija je uvedla model »vzemi-naredi-odpadi«, ki ne upošteva vplivov na okolje in temelji na obnovi in krožnosti. Krožno gospodarstvo (CE) je dobilo velik oprijem kot okvir za trajnostni razvoj in obravnavanje globalnih okoljskih izzivov. Vendar pa se države v razvoju, kot je Čile, soočajo s precejšnjo degradacijo okolja in socialnimi posledicami zaradi njihovega prioritetnega odlaganja odpadkov na sanitarnih odlagališčih. Za razvoj robustnega krožnega gospodarstva, ki koristi vsem in hkrati spoštuje ekološke meje planeta, mora Čile celovito preoblikovati svoj sistem vzemi-naredi-odpadi.

Države, kot so Slovenija, Nizozemska, Nemčija in Avstrija, so vodilne na področju ravnanja z odpadki, z več kot 30 zavezujočimi cilji, ki jih morajo doseči v zakonodaji o odpadkih od leta 2015 do 2030. Čile se lahko sooči s trenutnimi izzivi tako, da se nauči iz Slovenije, ki je učinkovito ravnala z odpadki. povezana vprašanja in dejavno napreduje pri doseganju svojih ciljev krožnega gospodarstva.

Ključna področja, na katera se mora Čile osredotočiti, so tehnike odstranjevanja izrabljenih odpadkov, strožji kazenski pregon, ločevanje bioloških odpadkov, zbiranje od vrat do vrat in ozaveščanje državljanov. Čile je z različnimi zakoni, časovnimi načrti in pobudami dokazal zavezanost napredovanju agende krožnega gospodarstva, vendar je uveljavljanje še vedno ključno vprašanje. Pobude za biološke odpadke, kot sta kompostiranje in vermikultura, nudijo številne prednosti in lahko neposredno koristijo skupnostim.

Ozaveščenost državljanov je tudi pomembna ovira v čilskem sistemu ravnanja z odpadki. Za ustvarjanje trajnostnega in celovitega sistema ravnanja z odpadki bi morali Čilenci ostati predani, angažirani in dejavno sodelovati, vključno z izvrševanjem zakonov in spremljanjem, ozaveščanjem javnosti in spodbujanjem vključevanja skupnosti.

Appendix 2: Interview questions (English)

Section 1: Analyzing the Current State of Chile's Waste Management

-How would you characterize the current state of Chile's circular economy and specifically the way it manages its waste?

--Follow up questions: What strengths and weaknesses can you identify? Which are the critical areas the country should be tackling?

-How effective is the current waste management system in Chile regarding waste reduction, recycling rates, and resource recovery? What is the biggest obstacle Chile faces in this matter?

Section 2: Assessing International Best Practices and adoption to Chile's context

What notable accomplishments or innovations have propelled other countries in pursuit of an effective waste management system?

How have these countries overcome challenges similar to those faced by Chile in waste management? Are there any specific strategies or initiatives that have been particularly effective in addressing common challenges?

In your view, how / can these international best practices be effectively adapted and implemented in Chile's context, taking into account the country's different economic, social, and environmental conditions?

Section 3: Developing Recommendations for Improving Waste Management in Chile

What advancements are necessary to improve waste management in Chile and align it with circular economy principles?

Based on your expertise, what specific policy measures and strategies, proven successful in other countries' waste management, can be adapted to the socio-economic and environmental context of Chile?

Appendix 3: Interview questions (Spanish)

Sección 1: Análisis del estado actual de la gestión de residuos en Chile

-¿Cómo caracterizaría el estado actual de la economía circular de Chile y específicamente la forma en que gestiona sus residuos?

---Preguntas de seguimiento: ¿Qué fortalezas y debilidades puedes identificar? ¿Cuáles son las áreas críticas que el país debería abordar?

-¿Qué tan efectivo es el actual sistema de gestión de residuos en Chile en cuanto a reducción de residuos, tasas de reciclaje y recuperación de recursos? ¿Cuál es el mayor obstáculo que enfrenta Chile en esta materia?

Sección 2: Evaluación de las mejores prácticas internacionales y su adopción en el contexto de Chile

¿Qué logros o innovaciones notables han impulsado a otros países a buscar un sistema eficaz de gestión de residuos?

¿Cómo han superado estos países desafíos similares a los que enfrenta Chile en la gestión de residuos? ¿Existen estrategias o iniciativas específicas que hayan sido particularmente efectivas para abordar desafíos comunes?

En su opinión, ¿cómo se pueden adaptar e implementar efectivamente estas mejores prácticas internacionales en el contexto de Chile, teniendo en cuenta las diferentes condiciones económicas, sociales y ambientales del país?

Sección 3: Desarrollo de recomendaciones para mejorar la gestión de residuos en Chile

¿Qué avances son necesarios para mejorar la gestión de residuos en Chile y alinearla con los principios de la economía circular?

Según su experiencia, ¿qué medidas y estrategias políticas específicas, que han demostrado ser exitosas en la gestión de residuos de otros países, pueden adaptarse al contexto socioeconómico y ambiental de Chile?

Appendix 4: Transcription & translation of interviewee N1- Tamara Ortega

Translating tool: Google translator

-Not by video, only as our voice so that I can later make the transcription, I only need you to give me your consent for that.
-Yes there is no problem.
-Okay, great. Well, I'm going to try to make it as short as possible so as not to go over half an hour. Ehh, I have some very specific questions, but hey, you can talk to me about what you think is most important. Ehh, first I'm going to tell you. talk a little about my thesis, I'm writing about the circular economy, well that was my topic initially but then that led me to realize that waste management in Chile is like the biggest problem there is in terms of the circular economy ,right? one of its ehh one of the most important things, so that led me to talk about waste management in Chile and and and nothing to talk a little about mhhh about the difficulties that exist in managing waste and see how we can move forward taking into account ehh practices from other countries, particularly Slovenia, which is the country where I live and they have developed very well in terms of their ehh recycling rates, lowering the amount of landfills etc etc. That's basically super short eh so that, I don't know if you want to introduce yourself a little about the role you have in the trash foundation.
-Super, ehh well my name is Tamara Ortega, I am executive director of the garbage foundation. ehh before that I have been participating in the garbage foundation for around 8 years or so, since more or less its inception I have been through different ehhh positions and positions. The truth is that I know quite a bit about the foundation of its beginning and since ehh how it has mutated over time, so I hope I can help you find the answers you are looking for.
-Great, super ehh well my first question is ehh how would you characterize the way in which Chile manages its waste at the moment. How do you see the panorama?
-The panorama here is very critical, the truth is, we from the foundation do not like to be very alarmist, ehh, but rather we always try to see it from the most positive or purposeful focus of the call to action, how we can get involved in that, but of course, yes one puts it in more data and more concrete, in fact the panorama is very critical ehh at the national level the sanitary landfills (...) thus make their useful life (...) 2030 2030 and something, some that last a little longer emm but with that We already seem to see it coming that this is going to end its useful life and then we keep thinking about, ehh, obviously generating a new landfill for the toilet is a whole process, it requires many years of study to be approved, for example, in metropolitan region there are no longer authorized lands for that since it is where the largest number of the population is concentrated, in the same way that they will be tested or they will come out, it is still something totally inefficient as you can ehh know well by seeing it as those of the economy bone circular we take things from nature to be able to bury them later does not make any sense. Ehh, in recent years there has been quite a bit of focus on seeing how we can improve that considering the solid waste crisis that we currently have. Ehh, but but cultural change and regulations are very slow processes for the time we actually have left in this landfill timeline, the issue of incineration has hit quite hard here at the level of companies, of companies that want to set up emm a couple are being created out there from civil society it is something that we have always opposed each other in a categorical and quite strong way so to speak from Chile we have different, ehh we are a garbage foundation but we form different alliances, there is the zero garbage alliance chile, for example, which sees relatively similar themes or we have

more or less similar objectives then when the onslaught of the incinerators has come and we try as a block, so to speak, to stop it...

-Clear.
-Ehh then of course one might think that the most logical thing is to manage this through the circular economy through ehh recycling, composting, prevention, etc. But I still think that we are not prepared for that, it is still very little. If one sees the composting recycling Figures, we really say that we do not reach 2030 with...
-Yeah.
-... and with something this powerful that we say we are really going to add weight to the waste crisis we have.
-Clear. I was still, uhh, I had the same point of view as you, that the situation in Chile is really super critical, which is why I am writing about this and what can we do to be able to move forward on this issue, right? ehh my next question also goes hand in hand eh with that ehh waste reduction, recycling rates and resource recovery which are like one of the most important things ehh what do you think is the biggest obstacle in this ehh in this objective What do we have to advance waste management? Do you think It is something that is due to a socio-cultural issue, perhaps there is a lack of investment on the part of the state for infrastructure or maybe ehh my third theory is about the laws of the eh state initiatives like what do you think is the obstacle? larger?
-I think it's a mix of everything you said before.
-Mhhje.
-I mean, we always propose the solution as a collaborative approach where, as you say, there actually have to be laws from the state that we can use to provide solutions. Currently, for example, we have the REP law, which is a totally confusing law, Municipalities need to implement it, but they don't even understand it.
-Mhh.
-Ehh we have the single-use plastic law that we have been working on for a year and a half or so ehh to be able to give visibility to why the law came out, but no one has any idea that ehh there is this law and municipal staff finally have to supervise it. where the responsibility lies and the municipality is given zero pesos considering that we have municipalities that have a person working in the environment.
-Mhh.
-Then ehh, of course one says that, the law has already come out, the law is beautiful on paper, it greatly encourages reuse, single-use plastics are prohibited...
-Clear.
-Everything that is consumption within establishments, for example, but when it comes to supervising them, is it okay who supervises them? Therefore, all these products continue to be sold freely available ehh at the national level ehh and from our side we have been providing advice and training ehh to municipal personnel for this ehh now we have a bill in Congress for organic waste that was presented by the current government…
-Mhhje.
-... and also aims for the municipality to take charge of the organics that are produced in its commune both at home level and at free fairs, pruning, parks, etc. But again it is a project obviously it may not end as it is presented but even how is it being presented again that it falls to the municipality to implement and supervise this, so if we are putting out environmental laws, okay, are they perfect, you know? but we need more resources and funding for proper implementation.
-Yeah.

-On the other hand, we also have the issue of the industry, which effectively has to have a redesign, so to speak, so that effectively everything we can consume at a national level can be managed in some way, whether through recycling or composting, today. Nowadays there are many things that are not recyclable in Chile ehh and suddenly you question certain companies or certain brands when they tell you "100 percent recyclable products" and they tell you that it is recyclable only that in Chile the technology does not exist.
-Mhh.
-You say how damn well that is not recyclable you cannot bring a ehh a product propose it as recyclable if it is not then there we also have a very big challenge that is being discussed the same but it is also very slow ehh I don't know for example we are with everything This issue of returnability, which I think is quite advanced compared to other countries...
-Mhhje.
-...Ehhh at least there are people here who defend Chilean Coca Cola quite a bit because I think it has a lot of ehh willingness ehh to returnability compared to other countries, but there is still a very big gap if one wants to take it for example I don't have the option of having it returnable for a 500 cc "Cachantun", it has to be disposable.
-Of course, of course.
-...little format, little diversity, so obviously there is a lot of lack on the part of the companies and unfortunately very little falls there, that is, a lot falls on the will that the company currently has to make these changes.
-Mhhh.
–…with this same single-use plastic law, for example, all food courts have to transform their ehh everything they deliver there into reusable ones, this law comes into force in its entirety now in August and there are only two food courts, two malls here in the metropolitan region…
-Mhh.
-...what they have done instead is that there are two months left and on the contrary the company is lobbying quite a lot to postpone it and to open the regulation to allow disposables within the consumption of within the establishments, then of course we have the law and yet the company is trying...
-Clear.
-...lower it or amplify it for your benefit.
-Like corporations dominate. Yes Yes.
-Exactly, particularly here McDonald's, McDonald's is doing tremendous political lobbying to lower, dismiss, many things that this law carries...
-Mhhje.
-...then listen, as a civil society organization, how do we fight McDonald's, no matter how much we unite as a block, I know that it is still super difficult, the resources are scarce and finally, as you said, there is the part of the citizens that although it is true there is certain…The changes in habits...
-Mhhje.
-..now, for example, you tell a person, it's not typical that we ask each other, hey, what do you work on and one says a little, ahh, I recycle...
-Mhh of course.
-...as it is already somewhat established, recycling has become quite popular, it is in fashion, ehhh, they have provided more good points with the REP law, the municipalities have the obligation to have points in each commune, but it is still very, very incipient, ehh...
-Very in diapers.

-...we know how recycling is clear, it's the tip of it, it's really not that it's any use to them anymore.
-Mhhje.
-...we can do so much more and then one wonders why we don't start, for example, with organic waste which covers a much larger amount. It is much simpler but there is a sociocultural change underway but it is still clear that it is very, it is low, there are certain things that cost ehh…
-Mhhje.
-...unfortunately, as we are in a very comfortable situation, disposables are very convenient to buy everything very close at hand, if there is something small that makes me uncomfortable having to go with my returnable bottle with my bag with something, it already creates a problem for you. break just like that, let's just leave it here.
-Clear.
-...ehhh so it's a challenge to share it.
-Yes, yes. Totally agree, ehh you believe under all this as a super negative forecast of the situation in Chile ehh do you see some strength do you see some area where Chile really has ehh been able to advance in a way that one says wow they are doing great well oh, the outlook is more negative, how do you see it?
-No, I think there is the same, I don't like to see it in a negative way to be honest, but I think the desire is there.
-Mhhje.
-...ehh when there are so many citizen surveys on plastics, care for the environment, etc., that has come out quite regularly here and that desire and motivation are still there. I feel that the infrastructure is a little lacking and the knowledge of how this is delivered, because of course I can be super immersed in this world so I have a super clear picture but for example like this if I ask my mother who is a person who is 64 years old mhhh that her elders...
-Mhhje.
-... ehh that she has the greatest sources of information about her on television ehh she tells me I'm going to the supermarket and she actually bought it, I don't know why she's going to prefer something that says biodegradable versus something else.
-Clear.
-...but there is also the whole issue of Greenwashing.
-Mhh.
-...that's why I tell you that the desire to establish is like there are people who still want to do something no matter how small it may be, so perhaps we need to take advantage of this driving force in some way and be able to apply it.
-Mhhhe, mhhhe.
-There is also quite a lack of something that we can establish from both basic and university education, now there are universities since they are putting it, for example, the issue of loss, of food waste in nutrition courses, ehh it is already being talked about, so to speak.
-Mhhje.
-...I think there is this feeling in the atmosphere that you have to do something ahhh now you have to transform it and lower it to concrete fractions.
-Of course, I was seeing that you at the Junk Foundation also do like ehh campaigns to promote, to generate awareness ehh and all as an area of education regarding this topic, do you think it is an area in which one of Focus more? how to raise awareness having campaigns on television or maybe what you see ehh that is the first step, the first step would be ehh ehh that starts from oneself or more like the government putting laws etc etc.

-Ehh I think it has to be more or less in parallel so that we move forward together and we don't have these huge gaps. Suddenly I want to do something, but I can't because it's not easy...
-Clear.
-...or what is feasible in the country, but also if the laws come out and no one is supervising them and if, for example, I continue to consume light bulbs or plumavit it doesn't make sense then...
-Mhhje.
-...yes they have to be in parallel but obviously there are things that, as I told you, how we establish it in education from the bases, bone, now there are small things that are in the curricula but it is still very little, emm, one will grow with this, bone You will now have the appropriate knowledge to deal with what the climate crisis is.
-Mhhje.
-...more than just recycling, which, as I told you, is what is most established and what we know, so there I do think there should be socio-environmental awareness campaigns on television to reach other audiences, although it is true that we do all our effort to spread this and be able to give tools in a simple way ahmm how to combat this, we do not reach everyone and obviously there is a stronger barrier because in the end this is still a niche.
-Clear.
-...and we cannot go to an environmental event in the same niche and always find the same faces.
-Mhhje.
-...so there is a strong challenge that is how we get out of this niche, so Of course, sometimes they give 1 hour in the morning to a person who cares about their life if they cheat on someone I know...
-Haha sure.
-...let's go in that way, it is also difficult, we have raised it many times, ehh we have, although it is true, we have many appearances in the press, that block, so to speak, extended, I have gone several times and they give you 8 minutes.
-Wow.
-...then there is the challenge...
-I believe support.
-...to be able to reach more people.
-Clear.
-Clear.
-Emm.
-Of course, maybe it doesn't sell as much but oh well.
-If that is the problem, ehh another question eh regarding what I am writing in my thesis which is like the most powerful part let's say is how we in Chile can adapt initiatives from Slovenia ehh in the context of Chile, for example Slovenia had super super super low recycling rates at the beginning of 2000 and a little after joining the European Union its recycling rates but exponentially they grew and there were super rapid changes in a super short period of time which is why I say wow because we can't do this in Chile, right, uhh, one of your initiatives was and because of what you've been studying, a radical change in waste management was door-to-door collection, the collection of separated waste that came here, of course, the truck was coming. of garbage and the municipality gave each house three garbage cans for papers, what else is there, for plastic organic waste and others and this was what promoted ehhh the separation of waste, right, so you think that an initiative like this could be adapted to the context of Chile?

-Yes, so it is totally adaptable, here there is a success story at the municipal level which is in the commune of Pintana, I don't know if ahh….
-I've heard it but not...
-(...?)
-Yes yes yes, I lived in Chile all my life hehehe.
-Now, now. Ehhh, it's a super low-income commune...
-Mhhje.
-...from the central-southern sector of Santiago, basically this shows you that with a little will and with few resources it can be done, they have a segregated collection program that has been going on for more than 20 years, if I'm not mistaken, they have good rates. door-to-door organic recovery emm.
-Mhhje.
-...then there you decide how damn if a super commune with few resources can do it why can't the others? and here it has also been raised a lot, obviously there is a lack of logistical capacity to install it but also hhmm there are problems that one says shit when you say that Chile is the cradle of neoliberalism, is it true that you have a garbage contract tied up for 20 years, cachai?
-Mhh.
-That a municipality, it doesn't matter that the mayor who leaves cannot do much with it because it is a contract that is already in place and you have to wait 20 years for it to end ehh obviously it is not the reality of all municipalities but they are things What if they pass, ehh there are other municipalities that do not have the capacity to manage these organics and what they are doing is training ehh individually to neighboring residents who give them their compost bin or their lombi-composter ehh I believe what you propose is a success story that has been seen everywhere that this is done. I was living in Canada in Vancouver in the summer ehh in the summer here ehh and effectively segregated collection one day a week you don't see micro-gardens you don't see garbage In the streets the people are super organized with their trash cans and I also thought the same thing, why not be able to do this. Here I think the disorder is so bad that they don't even take out the garbage when the garbage truck passes by...
-Mhh.
-...then the number of bags that you see of collapses so to speak on the corners ehh people pass by on the street who open this begins to generate small micro-garbage dumps as if we were as orderly as if one took out the garbage at the time one wanted. It is or if they already happen at night, leaving it in the last hour that one is going to go to bed would be a bit simpler but we have a little uncertainty in it... like the “mindset” so to speak that I take out, the garbage is something negative, I take it out and it disappears from my sight and I don't want to find out more and that's where I think is where we have to improve that negative relationship that we have, move what is not garbage to what is not waste, which are recyclable, compostable and when We are beginning to understand all this dynamic behind it. It would be much simpler if we had different boxes. It would be possible to understand that if we take the organic fraction out of the garbage can, there will no longer be a smell, you will no longer see juices, for example, they are benefits that they bring you. like even any person, ehh, but that's missing, that connection that we can make and say, look, if we take out this fraction, we compost it, you'll have almost free fertilizer if you do it, there are municipalities that actually deliver it because since the municipalities can't sell All the compost they produce is delivered to the same community, so we need to make this change of mentality with our garbage, which we have always been taught is something negative...
-Clear, Yeah.

-...and perhaps when we make this change we can reach what you say.
-Mhhe super, I was also thinking that if the mentality of the Chileans in terms of garbage is not changed because of course one says garbage that is disgusting, I also never thought that I would be writing my thesis about this but of course when I really realized how the problem was, and all the advances that we can really make in Chile ehhh it's something super super important ehh well then, I had a lot of more questions, I'm sorry let me just see ehh do you believe in terms of your experience or if you know of any ehh some type of action that we can take in Chile ehh maybe they have done abroad or something that you think is like the first action to take ehh to improve waste management, if you can Just like having a magic wand and saying well this is going to do the first step, what would you say it is?
-If I would start with segregated collection...
-Mhhje.
-...they are already being done in some places in fact ehh and they may be a little punitive but the system of other countries that have fines if you take out more than eh a bag of like garbage entails a fine eh yes it would because it is something I find that if a certain thing comes, I repeat, it is punitive and the idea is not to bring this closer to punitive, it is something that we are going to be able to do quickly and perhaps when we have this change of mentality made we can get this additional extra charge, which is something that I understand. worked in quite a few parts of Europe…
-Mhhje.
-...in Canada, for example, as I told you, the same thing was done and then they grabbed it as usual, so to speak, and it is strange that they generate, that they do not segregate, etc.
-Of course, of course.
-Then if I could leave for that, I would totally give it.
-Of course, of course. As there is a type of consequence, I believe that it is also generated as another mentality because one says, of course, here in Slovenia they also began to charge for an extra kilo of garbage generated at the beginning of the 2000s, so they actually had it half a month. bone centimeter to the point let's say ehh and then people said of course generating more garbage costs me more, let's lower it, right, and there the mentality of the Slovenian who lives in the capital or who lives in smaller places was really changed and it really was a super good implementation and now they are trying to reach a point of zero waste, that is, to generate zero garbage, which of course, well, one says that how advanced, right? And for that reason I want, I would like to analyze ehh ehh the possibility of implementing this type of things in Chile ehh so that, I don't know if you want to add anything else, something that you would like to share, I finished with my questions I think I have everything more or less.
--(...) really just complement the last thing that in the end I don't know as a human being or as a Chilean we are comfortable so if If segregated collection is at your doorstep, there's no reason not to do it, no reason to say no I don't do it and here as I tell you I can give you the example of my mother who is like an average lady, I find ehh when she had segregated collection she left things separated without any problem now in the building she is in she doesn't have it so she doesn't do it, so yes or yes I think it is a fundamental point that we can get to that and if (..) the certain truck already passes through here, we would only have to see the logistics of it being separated because for personal motivation it will only be those who are most interested in this topic that we get to the point so it is a totally important point to consider.
-Yes, ehh.
-...and to really close on my side...
-No, excuse me.

-...ehh nothing really good other than to congratulate you basically for being able to do this type of analysis I think that in the end it is tremendous we recently were participating in a tender that the regional government of the metropolitan region did to collect information on This is the same thing that they are ultimately million-dollar tenders that a Spanish group is working on and that basically one suddenly says wow, you are doing it, maybe the same thing with your thesis is not necessary so much as it lacks a little more motivation.
-Clear.
-ehhh, as I told you about the foundation, we always try to see from the positive side of teaching simple tools, ehh, how we can combat it from home so that it is not something so far away.
-Mhhje.
-...and finally we talk about the climate crisis as something that is very far away and we do not experience it on a daily basis and how we can combat it on a daily basis and I think we must maintain that simplicity ehh is this what Suddenly, if you go to the fair and you choose some ugly carrots, we are already making changes, so we stay with that simplest essence.
-Yes, yes, yes, from our happy side we can always take the time for this type of space...
-Mhhje.
-...because in the end we were all students for two things and on the other hand the impact is transversal, it doesn't matter where it is requested from and maybe there is a reason why you need particular contacts and suddenly we can help you make the link, you can write to us equal…
-Super.
-...write directly to my email and see if we can move forward there because finally what you are going to publish eventually is something that is useful to everyone.
-Thank you very much, we are in contact.
-Farewell, bye bye.
-Bye.

Appendix 5: Transcription interviewee N2- Jaka Kranjc

-Mhh as brief as possible, so we stick to the 30 minutes I only have like five questions. So very straight to the point.
First of all, I just wanted to get your verbal consent that the audio will be recorded. Yeah?
-Sure.apply
-Okay, thank you. It will just be used in my thesis but I'll Have to transcribe it and all that.So yeah, well, first of all, I'm going to briefly describe a little bit what I'm doing when my thesis so I'm writing about Slovenia's best practices on waste management and how can it be applied to third world countries, for example, Chile, which is my where I come from, right, because we have huge problem with waste management and Slovenia it's like a leader in this Oh, my thesis is how can we grab some of these really good ideas to discuss things that Slovenia is to apply in other countries, right? So, in a nutshell, that's pretty much that. So yeah, I don't know if you would like to introduce yourself. Maybe the role you do with ecologist without borders.
-Ahh sure, I guess I am Jaka, It was named after (...)So we do actually work across borders sometimes (...)And I wear many hats, but let's say I am the chief expert.
-Right ah do you do you lead the project?
-Yeah, we have in the association we do bunch of differents things, we provide Services (..)We run projects here alone, partners across the country, countries of the European, but also sometimes even further.For example, I think she was the one where the idea for plastic pirates project started and then it got adopted by Germany and then there was this triple concept Presidency of the European Union, Germany, Slovenia and Portugal and spread them those countries and now it's all across Europe already and we were teaching people in wait not the Jamas but, but in some Caribbean, same sort of microplastics and (...)It's gonna spread quite widely, but let me focus our association mostly works on waste, terms of waste management position. So how to enter what we prefer to do more. Waste prevention produces less waste.
And then the third related aspect is how to prevent pollution related to waste. We got started with a massive cleanup action. I'm not sure if you're familiar with the let's do it movement. It’s a movement of organizers of cleanups and now we have an even the United Nations level, recognized annual date of the world cleanup day. But yes, we still heard the word (..)basically when it comes to mobilization because 40% of the population participated in that single day to basically every cyber person. Unfortunately, we still have the record even though we're not doing the screen UPS anymore. Anyway, that was a lot of the capital. Terms of trust, terms of desire in terms of larger awareness, pursue harder problems in terms of systemic changes and you know long term awareness and education and Information.
-Mhhh. Okay, great, perfect. Umhh.
-Yes, It’s a long spiral. We're also part of Zurich, Europe. And, you know, global answers like break from plastic. So, I mean, I know some activists from Chile basically.
-Nice. Great. Okay. Perfect. Thank you. I will just jump right into the first question that I have. I'm quite sure you're probably more familiar with Slovenia's state of waste management. So, my first question would be: How would you characterize or how do you think the current situation or the state of Slovenia waste management or circular economy for that matter? How do you see that Slovenia is doing?
-It's a it's a very complex question. I would say, you know, you can look at some of the simpler statistics that we have, because we have goals of the European level, for example, for municipal solid waste, recycling targets that kept the reach, and I think it's 65 by 2035.And last year, I think reach around 74% separate collection, right.

-...So, we're likely, I don't remember I didn't check actually recorded for a second Figures because but you know, that's already 10% More…
-...we're close if not reaching the target 35 so that, you know, we are among the best in Europe together with Germany and Austria when it comes to separate collection. Recycling itself. Certain streams we recycle more than others, partly depends also on capacity, Slovenia is small, so some things we export elsewhere for recycling. So we do have when we still do export a little bit in third world countries, which I think should be banned, you know, there are some motions from the Commission in this mandate to make it harder and we got the waste shipment regulation and things like that. But part of our wastes is still leaving Europe, and it's probably ending up in places where it should.
-Exactly, yeah.
-So that's a minor thing, but it is a pain point. I would say, but largely in the country itself. So, I think the major pain point is that our system of extended producer responsibility is sort of a hijack or has been hijacked for the last 10 years in for some of the waste streams, It's working well. For many and especially packaging is problematic. It's been quite disastrous we have buyers we have waste not being picked up, stockpiling everywhere. And basically, all the reforms have been shut down in the past 10 years. Currently, it's an institutional part that didn't want to decide tonight at the European level court. So in a few weeks, we should have the next idea how to do the reform, just not wait for the European court because that could still be another four years…
-Right.
-...So maybe, maybe that's too technical. I don't know. EPR for you, but in general, I would say waste management is modern. Here. We are in the European Union. We are lucky to be interested in the history of how we came to this fact. That we don't have a lot of disposal infrastructure, you know?
15-20 years ago, most of our waste was landfilled.
-And we have one small incinerator and had to cement kilns so co-incineration plants and then through a quite bizarre let's say turnover events we had to close a bunch of the landfills down because of the higher standards of the landfill directive because we join the European Union. And at the same time, we screwed up the bunch of European funding. And so, for a seven-year period there was no European funding for waste management infrastructure. So, at one end we have (..)wunicipal solid waste, and the waste amounts were still increasing, and no money for any big infrastructure. So, it was natural everyone had better with what we had.
-Right.
-Right, so you know so more of the soft measures, let's say optimization, logistics,etc.
-Yeah, Uhmm so this leads me to my next question. I my thesis is pretty much that whether waste like the biggest issue when it comes to waste management could be either policies, right, so governmental action. The second one is infrastructure. So, lack of investment in proper infrastructure. And my third would be awareness, right. So, education. In this sort of categories, what do you think is the most important thing or it was the most important thing for Slovenia, for example, because you guys really, you had a such an exponential growth on recycling rates, and their landfilling start to decrease like it seems like you do everything so well. So, what do you think was the key point besides obviously entering the EU I think.
-So yeah, that's a good point. Because a lot of the environmental policies European level, so we just sort of inherited sometimes for us it's better to work at the European level if the ambition is lower in Slovenia, but you know, for the regional question, I would have to give a more nuanced answer. All three are important, but they're important. I mean, they're, let's say relatively importance differs depending on what sort of development stage you're

at. You know? If you think about looking at paths or something, you know, you need to focus probably a lot on infrastructure (there) to enable things first, but you know, once you have a certain level, infrastructure can only get you so far…
-Right.
-...It's sort of like a glass ceiling. And even if you have the perfect infrastructure and the perfect legislation, if people don't know that they should use it, of how to use it, or why they should use it. You know, you just want to reach its potential. You I mean, the efficiency is sort of one way so all three are important, for some things, you know, legislation is crucial, because it especially is a huge area of things, but we as much as we sometimes shift on legislation or you know, we're lacking vision or don't have this and that in Slovenia we're quite lucky because we did decide certain things quite early on. And I already mentioned the closure of landfills and you know we had to deal with the waste somewhere else. That was the reason that we started separately collecting waste in 2011, in Europe became mandatory this year. For us it was already 2011…
-Right.
-... And that already, that's like happened the(...) depending on the context. So, if you simply collect that you can compose it anaerobically majestic great, biogas, whatever and you already reduce the amount of Mixed ways that you will have to disposal significantly. It's like the simplest thing you can do…
-Right.
-...So, you know, in Chile, if you would have, you know, you know, even if you don't mandate separate collection of biowaste you know, just having programs or some sort of incentive for people to compost at home for example, or to have communities at community composting programs and stuff like that.
In the zero waste movement, Joel is really pressed hard on this bio waste issue, because not only is it like half of the stream of municipal solid waste, but also, you know, you can get a lot of value out of the material because it's sort of fertilizer and brings community together, communities together. Also important in the climate. Sense of things, because if you landfill, non stabilized ways that includes biowaste because the conditions aren't aerobic, you'll create a lot of methane. And as you know, it's important so it becomes gas.
-Right.
-So yeah.
- So ahh would you say that because I was obviously doing some research on what Slovenia has been doing, imposing a tax on landfill also the what's Snaga the the company did with separate, like segregation of waste door to door collection, and it seems according from my research that the segregation of waste and also the pickup from door to door was really one sort of impulse Slovenia to do better to really yeah, do better pretty much in waste management where you say that this is like the most important thing in terms of policies initiative that was done here in Slovenia.
-Uhh there are several crucial policies now, roughly at the same time as we started separately collecting organics. I think it also became mandatory to have a different, I mean, I think it was even a few years before but the way we priced waste management, at the municipal level and then for us, households or individuals, this is where we have I don't know if you heard of the concept of pay as you throw?
-No.
-...in waste management, but it's an economic incentive…
-Okay.
-... where you pay less for waste management if you produce less waste…
-Right.

-... or if you manage it better. So, if I give away my let's say packaging, to the bin, it's almost for free. If I put it into the mixed waste bin then I have to pay quite a bit more. So people are incentivized monetarily, to properly separate the waste and in some say is also to produce less of it. So we have at the country level, I really light a really simplistic version of the pay as you throw principle applied, where basically the price depends on of course, how much of the mixed waste you have, but then typically it's ,about collecting trucks don't have all this extra work to it just about the amount of fees you have, basically their volume and the frequency of collection. And once you do have, this is the second thing that you mentioned. Door-to-door collection is all about making waste management, better separation as easy as possible. So they don't have to work 100 meters to the next bin,right?
-Right.
-You want to bring it as close to them as possible. For what makes sense because glass is quite heavy and typically doesn't make sense to have it everywhere. Like that. but in depends on multi storey building, etcetera. It gets complicated. But yes in general, no collection is what enables you not only to make it easier for people to separate vendor, but it also allows you to decrease the frequency of collection because you have more bins that for the fractions that we know what to do later.Let's say what to recycle onto them, and less of the others and then it can have different sorts of roots. And you realize oh yeah, actually I can pick up the mixed waste only every second…
-Right.
-...or once a month or every three weeks so it enables also, sort of logistic optimizations for the waste manager itself, bears it throughout the collection. And another cool thing we have in Slovenia this and this is I think unique. I don't know any other country have it, that a few years back we decided with our composition analysis of mixed waste. So everything that's not separately collected every year in every municipality this they have to do, basically a lab has to do it. They can't do it themselves, of at least one sample of mixed waste and they have to basically sort it or resort it into 23 different branches.
-Okay.
-So, each year, we get that fresh picture. What's remaining and this is another thing we really advocate in the zero recipies program or in general because then you know what's wrong?
-Mhh.
-Because you know for things like packaging, or E waste for (..) candles and Slovenia, for cars, etc. Look at this extended producer responsibility so producers have to be for the waste management upfront…
-Right.
-...So, this waste is you know, in our minds and it's being managed, but when you're getting better at service collection, most of this waste will be separately collected. And the question is what remains in the mix place. And then you know get occasional construction waste, you get the higher and higher ratio. nappies you have things like coffee capsules, aimlessly. So we have, we have this snapshot and we can see okay, well, the amount of organics in our mixed waste is still very high. So clearly, even though we're collecting Waste separately, not all of it, and then you can start thinking about measures. Is this a thing that requires changing infrastructure? Is this just about awareness raising and mismanaging things? Or is this just a product of the circumstance because in some municipalities, you know, you don't have to have a virus pin to compose at home, but people typically don't put scrap because meats and stuff like that my address rats and mice and whatever, so they don't have a (...)in the mixed waste, right?
-Right.

-...So it's good to identify things that should have extended producer responsibility like textiles like (..)
-(..)
-...and for things that we already manage, but wow the share is way too high. Let's do something about it.
-Yeah, it's Slovenia is really taking it to the next level. I also was reading about this really top-notch sort of waste facility that is somewhere somewhere in here in Ljubljana and or I think a little bit outside of Ljubljana. Where Yeah, I'm not quite sure where it is. What how.
-its, its?
-Mhh? yeah so.
-Yeah, it was maybe...
-Yeah, no sorry, continue.
-...it's among the better but its not top notch already, or not anymore. There are better facilities out there, because it can also do well the term that's mostly used nowadays is mixed waste sorting, or mdrd. No MBT is a typical mechanical, illogical treatment right for mixed waste. But the new concept of mixed waste sorting is so called sometimes called MRBT.
-Okay.
-... yeah, so, mechanical, recycling, I guess we kind of recycling biological treatment. It's an upgrade of the MBT concept where you can because we see in several cities that you can still extract maybe 50% of valuable materials from the mixed waste stream, even places where they separately collect around 90%. Right?
-Mhh.
-...So, there is a lot of value in the materials that sort of leaks out of the system out of the loop.
-Right, mhh.
-..so in this case, I think they do extract a few things from its place.But I think It's mostly the simple stuff like metals, right?
-Mhh.
-(...)
-Right.
- So hopefully this is some some development thing for the future. But yes, if you want to visit the (...)
-Okay, good. yeah, I've been in the last few weeks I've been going through this landfill and see how you guys sort sorted or segregated waste has been amazing. You're so advanced, it seems versus to what we do in Chile. So, which is why I'm writing about this. So I just have two more questions a little bit more focused on from your perspective, from your experience that you've had in this industry, let's say do you think these practices that have been adopted into Slovenia Scala in Slovenia context could be applied to let's say, Chile who still has you know, it could be considered not so much as a third world country? UHh We do have, you know, a pretty high GDP. And also, we have extended responsibility program law. We have all the laws in place. What I'm trying to Figure it out is why these things are not working right? So do you think this this type of initiatives could be applied into a context of Chile, for example?
-Yes, for sure. I mean, I wouldn't worry too much about GDP, things like that.
Also, among the most developed in South America.
-Yeah, it is. But But still, it seems like things are not working. Right. So, my, my question is why? is not working?

-Yeah yeah, I know It's a huge country, but also, we do have members in Chile, working on things like this. I can connect you if you want.no problem.
-Yeah.
-I mean, members of our association with the word network. So, you know, sometimes we were very happy after just between members to manage to change some legislation So we would have prolonged monitoring. So, we could see how things are developing, whether there's stagnating going for the better or for the worse. And we're so happy because it's hard to change this, like shouldn't and it was a big success for this NGO to just, you know, dimension then have this kind of this concrete action plan in place, but then you know, it's evicted and then nothing happened. Haha.
-Mhh.
-So, you know, just the handle the paper. So, legislation is important. It can be an enabling factor. It can really set the stage certain things like EPR you mentioned are quite complicated, because there's a lot of interplay and all this freeriders internet shopping messing things up, but also the circular chain, right, the circular economy strategy, which…
- Yeah, yeah, we do have we have a roadmap to circular chile by 2040 If I'm not wrong, we're very out there, you know, we have everything in place it just exactly.
- Yeah. roadmap. Exactly.
-Yeah, roadmap. So yeah.
-That's that's so that's our focus. Its been part of Slovenia's knowledge basically. So, we already have, we already have some new stuff to speak. But anyway, I wouldn't. You know, we're we have quite different contexts. So, I'm sure you can just say, oh, yeah, just copy paste.
-Right.
-But certain measures you know, tararatarara because awareness raising, you know, we could have 95% separate collection out across the country. We could go all the instruments actually one by one, but this work on education, on awareness, raising on having information, the ability, this is a never-ending thing. It's not something that you do it you're you're done. So, and this can be done anywhere with any resources, uhhh you know if you take, for example, Ljubljana it's a big city has (..)and then they can do larger, let's say public campaigns compared to some small villages, right. 100 people, right?
-Right.
-...and it still hits on. On the policy side, I'm sure I know that you have some great policies.
-We do.
-We'll learn more. I guess more in this broader Circular Economy context where you can minister organized and stuff like that. And then infrastructure in industry is quite a challenge, I guess, because that's expensive. But you know, if you started focusing on biowaste, that can be managed really cheaply. Because composters you can do it from local materials it doesnt have to be a large industrial plant…
-Right.
-...that is complicated to build to (..) because it's a distributed system. Community composting or individual composting should push for that, whether that's through mandating into the local level and eventually at the national level, rather than through incentives or whether that's through some community programs where I know we have for example, imagine the Philippines highly densely populated, all this waste is generated. And they didn't have a lot of legislation initially. So, the communities themselves started organizing the NGOs and things like that. They just self organized collection of waste. And they taught people how to do it that way. It was door to door in a sense because they literally were pulling rickshaws aroun and collecting waste, right?

-Mhh.
- And eventually the local community. The regions recognize that and then it became legislation. So, I mean, it's pointless to me to try to sort of retell the story of how activism works in general. There are so many ways you can move forward.
- Right?
-So, I really don't feel the most confident to talk about this because I don't know enough about Chile. But yes, if you want, I can connect it to our guy colleagues there.
-Yeah?
-We're both (..) and no global and European levels.
-Well that will be great. I would appreciate that. Lastly, I wanted to ask you, this is besides my thesis, I would love to I found the website. Did you guys have the option to do volunteer work? Do you have any active volunteer work that I could join? Or maybe I could email you because I would love to do something and be more active you know, on the matter.
-I mean, currently there's nothing like that typically, as a volunteer would like because volunteers typically want it let's go somewhere together. Let's have fun, right?
-Right.
- For us is not like oh, yeah, currently we need help with translation or you know, can you write an article or stuff like that?
-Right.
-I don't know if thats interesting to you?
-Yeah, for sure.
- I would like to do any sort of volunteer work honestly. So even if it's, I have experience with writing articles. I work a lot of work freelancing and stuff like that. So, and also, I speak Spanish and a little bit of Slovene so I think I could put into into work.
-...yeah, there's you have a quite the Slovene surname.
-Yeah, my my grandfather was born here. So, I have
-(...)
-No, no, no, it just says my grandfather. So yeah, well, Jaka I just want to thank you for your time…
-(...)
-Yeah, sorry?
-Oh yeah, we also have events to manage with better and to see and that involves going to the events and helping out and taking pictures and monitoring. So, if that's something interests you, it's event season so you could join some…
-Super.
-... of our colleagues.uhh yeah please write an email…
-I will.
-so, you know, just certain days of the week work for you.
-…Yeah. I will write an email to info Well, whatever generic or I could write to you directly. So if you have anything just just let me know I think I could manage so I just want to thank you so much for your time gave me really good input really led my way a little bit so thank you very much, and I hope we'll we'll be in contact in the future for I really want to get into this this industry. are what interests me a so I hope we we see each other again. Thank you so much.
-I'm glad that more people are working with this because it's it's a really expanding field and we need more people understand…
-Yeah.
-...what's the best way forward. Thanks, and have a good day. Bye

Appendix 6: Transcription interviewee N3- Nicolás Behar
Translating tool: Google translate

- I'm going to be super short, I only have 5 questions, eh, but first of all I need your consent to be able to record, I'm going to only record, let's say the audio, right? to make the transcription and be able to put it in my thesis
-Go ahead
-Yeah? Okay super, great then well as I told you initially I started writing my thesis about the circular economy which led me to write about waste management in Chile and the strongest part of my thesis is to see how we can incorporate practices from Slovenia of the country where I live in the context of Chile, right so my first question
-First, a pause before leaving, are you half Chilean, half Slovenian?
-Slovenia yes yes it is like next to Italy Austria Hungary from my grandfather I am Slovenian yes eh yes that well first if you want to introduce yourself a little talk about also seeing that about the work well you are the founder of recylink true and well I don't know if you want to tell me a little about yourself, how you are involved with this area.
-I have been doing this for 7 years, before that I did a master's degree in the environment at the University of Edinburgh in Scotland and since we started with recyclink I have been dedicated to the circular economy, industrial waste management, first we started the construction and Well, we opened the entire industry to the entire country as well, and we are operating it in Chile as well as in Costa Rica and Peru.
-Super, great, then well, my first question, a little general, is how do you see the panorama in Chile of waste management, do you see the positive voice plus negative things, how do you see the panorama. -I see that there is still a long way to go, but that it has evolved a lot in recent times, I mean I have been in this for 7 years and I have seen how it has been evaluated and I have seen that there are more and more things, more options for more solutions in the research. There are events too, and now with the REP law even more so, because there is a lot of money injected there.
-OK, super, and what do you think are the most critical areas in terms of waste management in Chile? I have obtained answers such as from the Garbage Foundation and other other foundations also in Slovenia. I don't know where they can tell me a little about infrastructure, perhaps public policies. or uh challenges like sociocultural how do you see this what is the area where it is most problematic?
-The cultural part, bone, that people really care and want to make a change, and also on a normative side. The regulations are behind, the same as always, because they are never as fast as the (rest) of the world, but beyond the regulations themselves I think it is the transfer of the regulations, the inspection, there we are very slight.
-So for example the implementation of the REP law and all these public policies OK great eh well my other question is well maybe I'm a little general because I know that I am seeing something super particular in terms of the public policies that have been made here in Slovenia and how to adopt them to Chile, but do you think it could be possible to adopt ideas from other countries to the Chilean context? Hey, can you hear me, Nicolas, I think

the connection was lost? now yes now yes OK sorry well my question was yes the internet is very bad since I am in the capital but I don't know a terrible connection. Well, my question was whether you think it is possible to implement some practices that have been implemented in Slovenia in the context of Chile, for example, at the beginning, like in the 2000s, many landfills closed here, for example, to catch up with the standards of The European Union either put a tax on landfills or started door-to-door collection of organic waste. Do you think it could be implemented in the context of Chile?
-Yes, I don't think we are that far from things that are done in the European Union, not at all, ...it started to rain...and there are things that Chile is already doing, that is, on a pilot basis regarding your organic collection, you know. 10 years in La Pintana, more than 10 years, and it works well, the garbage foundation took me there, and the landfill thing is a matter of public policy and inspection because it is putting a public policy and the other thing is to monitor it. It could also be done, that is, I don't think that Chile has limited your human or technological capacity to be able to imitate things that they do in Europe due to an infrastructure issue. Regarding infrastructure, we are catching up quickly, So, I don't see it as that complex, the REP law is a replica of Europe to Chile.
-You then see that the biggest problem may be the financing of these public policies because there are municipalities where there is no person in the area of eh, what is it called, how does it give green areas, let's say not for lack. Better yet, do you think there is a lack of financing there?
-No, a lack of will, financing, there is funding, but no will or environmental culture, that is the problem.
-Okay, well and my last question well 2 last questions the last question would be like recommendations what recommendation if you had let's say a magic wand to make the first change that is fundamental in terms of waste management in Chile where would you start what do you think is the first thing you would do? we have to tell how to attack
-Illegal landfills, inspection.
-OK eh super and my last question is about the REP law you at recylink eh focus a lot on the REP law so you were seeing a little bit about what it does on your website, but how much of it is like your involvement with this law and if you see some I don't know some positive or negative things about the REP law of responsibility
- I mean, positive, everything is positive on paper, but implementing it is the hardest part and we are starting to get involved, we are just launching a new solution for that and we are going to start enabling it with some current clients, so we are starting to (...).
-Yeah, great, so to summarize, you see the biggest challenge as the sociocultural challenge, of course, like changing the mentality of Chileans a little in terms of recycling and waste management. Do you think that's the most important thing? ? -Aha - OK, super good, that was my question, thank you for your time. I don't know if you want to add something, okay.
-NO, well, if you have any results, send them to me.
-Yes, obviously, don't worry, I still have a couple of interviews left, but Chile has cost me a lot, something leader wants to talk to me, but of course my test is going to be published

on the university website and and That would be more than anything about how far my (..) is going to go, but well, thank you very much for your time and we are in contact, thank you bye.

Appendix 7: Transcription interviewee N4- Felipe Marchant
Translating tool: Google translate

-mm well, first of all, thank you very much for your time, I'm going to try to be super short, I only have 5 questions. First of all, I need consent to record the audio of our conversation so I can transcribe it into my thesis, so I don't know if it's okay. well that
-Yeah?
-Yes of course.
-Okay perfect well then very briefly about my thesis initially I started writing about the circular economy in Chile and that led me to write about municipal waste management as the biggest problem we have in Chile right and I am doing as a type of comparison or perhaps what we can do to be able to advance a little on issues of recycling and waste management basically, so well first I don't know if you want to introduce yourself a little about what you do at the municipality, your role, etc.
-My name is Felipe Marchant Villaseca, I am an environmental engineer, I am currently the director of environmental management, I have been associated with the issue of waste since 2004 or so, where we began with the planning of the waste separation project. waste at source in a context where there was nothing, where there were no environmental institutions or even regulations associated with where to orient yourself, I don't know and I think that at this point in a way... almost 20 years have passed since that moment, nothing, the regulatory apparatus, so to speak, has been adjusting in some way and has implicitly recognized that in reality the madness that we proposed many years ago there was not so crazy but rather was part of the path that had to be followed to achieve good waste management.
-Well, from the beginning...
-That is the context...
-Yes, because I have spoken with the Junk Foundation, for example in Chile, I was also speaking with some academics from some universities about waste management and absolutely all of them gave me the example of the commune of La Pintana, how, of course, as an example of what it really is. What Chile can advance in municipal waste management issues, so I'm super happy to be able to get a view from the municipality, not from what happened, so great, my first question is quite general, How do you see the general panorama of waste management in Chile? more positive negative how we are moving forward like the panorama today
-Look, I personally believe that we are still in a very complex scenario, although I must recognize progress because there are, there are regulatory advances in infrastructure in general, but there is still a very substantial distance between what corresponds to general policy and then individual policy. of each territory, I think that this still cannot be reflected in a management system, at the level, I don't know if we see it in a more optimistic way at the basin level for example, only considering that the region has more than 50 different communes that They have different budgets, different socioeconomic levels, different territorial or geographical characteristics, different levels of density, infrastructure, in other

words, we are very different, in terms of the characteristics of the territory, although we are all people and we all produce waste, there is still no such balance that What allows us to say, hey, a person who lives in La Pintana generates 1.1 kilo of waste per day, a person who lives in Vitacura generates 1.1, the same, but with different components, right? The budget allocation unfortunately allows for quality differences to exist. of service, then a solution that for a group of people can be tremendously advantageous and easy to implement, for reasons of resources in our place it is tremendously complicated to implement, why are people different and have different problems so when they ask me many times They tell me how you manage to convince people, that is the key to anything, how I convince you, for example, that you make an additional effort and that you join in, unlike another place that tells you, don't worry, I I hired a company that comes to my house and separates everything and takes it away. I do waste management but I have it incorporated into my budget, because I have the resources to do it. There are people here who don't have the resources to do it, so they must have their time, which is ultimately the most valuable resource and that is difficult to manage, so when there is not the same level of conversation between general public policy and local politics, these distortions are generated in space, my opinion regarding this issue is that it is What must be addressed is to strengthen the municipal institutionality, with a minimum standard, well, notice that it exists... and as one investigates one realizes it, but for example there is also an implicit tacit agreement that all the director of administration and finance has to have a level "A" that all control directors have to be at level "A", that the municipal secretaries have to be at that level "A" of the municipal hierarchy, but the directors of cleaning and decoration of the transit environment, among other directorates, are directors of different categories, therefore in the organic there is no formal space for in some way a management that is as relevant as waste management, but not only waste, issue environment in general has admiring support of the same level as other directorates, they are going to tell you, you are not asking me for money to make an "A" contract, and I am going to give you half of what you are asking me for and see What can you do, what is happening in communes like Sán Ramón, La Pintana and why not talk outside of Santiago, where the budget (…) still exists, so there is still a long way to go.

-Totally, as far as... I'm writing in my thesis, where does this problem come from, as you say, an issue of investment and financing towards the municipalities, creating as a standard, I was also looking at the more socio-cultural side, like you did, how to convince the person who has limited time limited resources to at least segregate the organic waste, for example, what area do you see, perhaps a little more critical will perhaps be the public policies that are not being implemented, for example the REP law or perhaps one more thing about infrastructure investment financing or something more like sociocultural or a bit about the challenges we have with the communities?

-Look, in order of importance, according to my experience, the most important thing is trust, you can convince someone but to be able to convince someone you have to know the person you are going to convince, so when a strategy is generated and where... as I told you a while ago, about the distortion that exists between the central level and the original

idea and the way it is reflected in the territory, there are many people in between and many times then when I say I want to advance in the national strategy of organic waste, which I also do not agree with the name, I could call it vegetable waste, when it arises nowhere is it developed, what is the main objective that I seek from this, and notice that I compare it to that conversation that we had many years ago back when we first faced financing issues in 2005 and decided to start separating vegetable waste, we asked ourselves how to convince people without any economic incentives to offer, they aren't going to pay either. So, how do I convince people (..) and in those conversations they say, I don't know, let's do like the politicians, let's go out and talk to people, then we began to realize that first it is very difficult for someone to talk to with you I say no, then, out of every 10 conversations I have, 8 are going to say yes, 2 are going to say no, but of the 8 that say yes, in truth, only 6 are going to participate, But if you don't have their trust and you don't cultivate that trust with respect, that will fall away, and the only thing you're going to get is that they give you the opportunity to prove what you're saying and they're going to be able to convince you. proof.

-Was this, as this comes from the trust of talking with the people of the municipality with the inhabitants, the residents, I get the impression that it was like a key part in terms of the establishment of the separation of plant waste, it was really this one of the key things? Talk to the people of La Pintana...what is the success of the commune basically due to?

-I think that after much reflection it corresponds to that, to the way in which the conversation was approached, although it is very difficult to maintain because it requires political will, that there are opportunities in which it is and others in which it is not. And there perhaps I jump to the next part of the problem, the mayors, I mean, I personally believe, I take responsibility for what I am going to say, I believe that mayors need academic training to understand that cultural transition mechanisms require permanent financing and support. I mean, it's a matter of seeing what happens at the country level, one can map all the communes where there are problems of financing (embezzlement) let's say unfortunate investments of resources and that has to do precisely with the capacity of the political authority that If an authority still fails to understand that a transition mechanism and cultural change like this require permanent financing or require support to be executed, it is lost. So when you talk to the neighbors (…) consciously, because that is what we are doing (…) very far away from what I normally do, you have to start by convincing yourself. So look at the people who work with us here, I would say that a large majority, at least there are personal attitudes. I have had a vermiculture farm in my house for many years, I don't have any plant waste, we separate everything we can separate, we wash three times, we remove the labels (from the packages) and it is not that difficult when you get into the habit, but the problem is developing these habits is challenging, but crucial. However, public policies often don't account for this. Simply dictating orders isn't enough; a process of community engagement and habit formation is necessary, I think. There is still a path to take and that is what we are missing in my opinion, it is the process of linking with the community where I as a citizen say OK, I am going to join this and eventually incentives of other characteristics can be generated. Notice that in the conversation about

the law of the project of the (...) where I had the opportunity to participate in one of the idea that we proposed, although it may seem like nothing to do with it, but if we proposed it it was because we studied it, note that in our opinion the The greatest incentives for this have to go to the field of sports, which provides investment in health. So we proposed to the ministry, we told them, regardless of whether I give a discount on electricity or water or anything, give it to the people. the opportunity to go swimming or go to a gym whatever, but give people the opportunity to participate in this, give them the opportunity to play sports, what will that impact, because I discussed this with the director of health has been around for a long time, which has a concept, which I have forgotten at this point, but he told me, as long as people play sports, they have fewer illnesses, less illness generates less spending on public health, people doing sports, happier people , people who are doing sports (means) people who spend their time doing something else, then a benefit of that characteristic, such a complex issue, that you have to talk to all the mayors and agree, the municipal gymnasiums, blah blah blah ….
Finally one sees from the obstacle but I believe that it would have actually worked (….) the leisure of the people. But you know there is an app that does it.
-Great, one of the other questions I have because in my thesis I talk about how in Chile in general we can perhaps implement initiatives from Slovenia in the country where I am living because at the beginning of the 2000s they also had a super critical situation with the management. of waste and in a period of 10-15 years they fixed everything but in a very very very drastic way and just like the pintana they began with the separation of organic or vegetable garbage, true, then they went to door-to-door collection which was like what It practically changed the levels of recycling, waste separation, etc. and they also closed many landfills. I know that the issue of landfills is a very big problem in Chile. Illegal landfills and what do I know? So the issue of landfills in the commune of La Wow, I imagine what the issue of landfills is like? Have you been able to close some landfills? They have been able to reduce the amount of garbage that goes to landfills or these landfills. I don't have much information about the subject, but I am a little interested in whether something has changed on the subject in that area.

-Look, in the territory of La Pintana there are no landfills associated with household waste, we have micro-garbage dumps but they are those that have periodic behavior, on a corner for example someone leaves a chair, something out there, well, it doesn't go beyond that. Fortunately we have final disposal coverage, we have a contract with the Santa Marta landfill, now regarding the second part of the question, how does that impact, I think that all the effort we have made has an impact on the decrease in the growth curve (of generation of household waste), nothing more than that. It would be impossible to tell you when we started we had 170 thousand inhabitants and now we have 240 thousand, that is, if we had done a study with 170 thousand, maybe I could tell you if, indeed, we achieved a percentage decrease of “that much2” but the population growth that is still going on, and we hope to receive many more population, obviously it is pushing all the Figures upwards, so the only thing that the management of segregated waste, be it vegetables, or other

measures of the REP law manages to reduce the curve, perhaps it will be a little steeper in the sense in which we continue to capture a significant amount of tons of waste per day but to the extent that benefits are not already implemented in some way?, it is still an expense, an expense that the municipality assumes (...) it is still a cost. So, there is no incentive for the municipalities to implement it (rep law) *, I don't know if you have gotten involved or are going to do so in your research, in the financing of the municipalities.
-No.
- Well, just to tell you, notice that municipalities like La Pintana receive contributions from their own income such as commercial licenses that are in their territory and then a contribution from a common fund that is generated to make a redistribution between the richest communes, to others with fewer resources, where Lo Barnechea, Vitacura, Providencia, Viña del Mar, con-con, among some, are important and are distributed to others.
In this context, the communes that carry out this type of management do not receive any type of economic incentive as a reward, let's say, the communes that have an implemented comprehensive waste management system, we are going to allow them access to This "special thing" for the communes to do more projects, so that they can finance through the regional government, does not exist. Therefore, the political authority does not have an incentive to prioritize projects of this type and normally the prioritization of the political authorities, that is why I was talking to you about political training, academic training is important, because they normally concentrate only on infrastructure basically. There are mayors and mayors who all they say is, fields, fields (soccer), we are going to make only fields, because people see the fields, and I inaugurate and inaugurate, because they are shown, but they are places where older adults live , no one occupies it, I mean, because they did not invest those resources in making bio-digesters, not those bio-digesters do not give the same impact (...) and there is no more way to put knowledge there.
-Another question, I think the last question is... Slovenia at one point, one of its initiatives was to charge more for garbage management, right, so the more garbage the citizen generated, the more they were charged, so that was a type of incentive or let's say a penalty towards the citizens and obviously no one wants to spend more money and this began to generate less garbage and the next step they took was to reduce the frequency in which the garbage was collected, which also helps people to fill their bins and of course He says no, I have to start generating a little less garbage, do you think you are kind of an initiative or also like the segregation of organic waste at the municipal level, maybe some kind of eh something that may not be at the national level but that is a little more at the community level, I don't know, can it be carried out in general in Chile? Could this kind of thing be implemented immediately? You see it, you see it possible, of course everything is obviously taking into account the area of financing of the incentives towards the municipalities, but in general terms could these things be implemented in Chile? or close the illegal landfills very very very quickly. I don't know how to put more effort into something more immediate.

-So, I agree with the measure, I think it is a very interesting way to put problems on the table quickly, but we live in a system where decisions are made by politicians, so there is a problem for this type of measures, which They are (the area) technical, yes, if there were in some way an infrastructure support where the ministry had the capacity to say, we are going to take this drastic measure, without going through political approval, it could be implemented in a relatively short period but I think that politics in this case works against us, because no authority is going to take the risk of losing its political capital by creating new positions, so it is like saying, I am burning my entire political capital with this measure that, although I find it very coherent, very intelligent also because it forces you to react as a person, it forces you to separate and control consumption to produce less (waste).

-That would be ideal not because the situation in Chile is critical in terms of waste management...
-Very difficult.
-It's cutting a little...
-Note that there are sectors, what happens in Chiloé for example, the landfill is collapsed, each collection truck has to leave the island, they travel more than 600 kilometers to go dump a truck, so if in that context no authority has the ability to say, we are going to charge a tax to the person who generates, individually, which we also discussed at some point in the process of discussing the REP law because if you review in normative terms, you will realize that the payment of municipal cleaning rights, is the “precursor” of the REP law. The problem is that not everyone pays municipal cleaning fees.
-Exactly, not everyone pays those contributions.
-So, being exempt, reversing that situation is tremendously complex, because it is the political authority's springboard, the political authority says, I want to get out (re-elected) for 4 more years, how am I going to charge the neighbors again for paying my rent? trash. If there were a law, it would be different, in that case, all households in Chile will be obliged to pay for the generation of their waste (...) at least I would implement it like this, I would leave an exemption for people who generate less than 35 liters , For example. Above 35, a payment scale begins and with the exception of people who participate in separation programs, for example, our waste management ordinance already offers a 50% reduction for households participating in our separation programs, recognizing their effort.

-Perfect, thank you very much, those are basically all my questions, thank you for your time, I really love this topic, I have been super involved in this this last week, especially writing my thesis and I have another interview to do, so nothing in general, thank you for your time eh, many things that you have told me about are also in accordance with what I have written so far and what other representatives of waste management in Chile also tell me, so thank you very much, all the success to the commune and I hope that we continue, you had us making progress in waste management
-Thank you very much, I hope it goes well for you.

Appendix 8: Acknowledgments

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