

Waste Management in the LATAM Region

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Waste Management Country Report: Chile

This paper aims to provide a better understanding of business opportunities for the Netherlands waste/circular economy sector in Chile



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CHILE

Country Information

Chile is known as one of the best producers of premium wine. In 2010, the country became the first member, in South America, of the Organization for Economic Co-operation and Development (OECD). Chile is also known for its stable and responsible macroeconomic and fiscal policies. The country is considered an attractive starting point to later on expand to the rest of the countries of Latin America.

Chile has set ambitious goals towards a sustainable and circular transition. The main strategies are: [the Energy Roadmap](#), [the Roadmap for Circular Economy](#), [the Plastic Pact](#) and the “[Extended Producer Responsibility \(EPR\)](#)”. In addition, Chile’s current policy pathway includes a Renewable Energy Law and a Carbon Tax. The country has experienced social unrest since October 2019, followed by the COVID-19 pandemic since early 2020. As a response, the Chilean government has used the momentum to plead for green recovery and has even intensified its climate ambitions. For example, early 2020 Chile has adjusted its legislation by [updating its National Determined Contribution \(NDC\)](#) committing to reduce net GHG emissions up to 45% by 2030, compared to 2016 levels.

Key Indicators	
Size	The Netherlands is 5.49% the size of Chile
Population (2019)	19.1 million ⁱ
Nominal GDP (2019)	USD 282.2 Billion world rank: 43 ^{rdii}
GDP per capita (2019)	USD 25,155 ⁱⁱⁱ
Import from the NL (2018)	USD 83 million ^{iv}
Economic growth (2018)	4% ^v
Ease of doing business rank (2019)	59/190 ^{vi}
Corruption index (2019)	26/180 ^{vii}
Unemployment rate (2019)	7.2% ^{viii}
Currency	Chilean Peso (CLP)
Time difference NL	-4/-5/-6 hours

1. The Waste/CE Market Analysis

1.1 Facts & Figures. Waste Generation and Composition

Chile generated about 23 million tons of waste in 2017^{ix}. 97% of this amount was non-hazardous in nature. Non-hazardous waste mostly originates from industrial sources (60%) and from municipalities^x (35%). Sludge from sewage treatment plants contributes 1%. Almost half (49%) of the waste is generated in the Santiago Metropolitan Region, making this area a prime geographical focus of ameliorating actions in the waste sector. When it comes to the composition of the waste, 58% of Municipal Solid Waste (MSW) corresponds to organic waste. Less than 1% of this amount is valorized through composting or otherwise^{xi}. Only 12% of plastic packaging and 5% of tires is recovered at the end of their life cycle^{xii}. Regarding waste coming from industrial sources, the agricultural sector generates 1.6 million tons

per year and C&D waste amounts to 230,000 tons per year^{xiii}.

The country has three waste data systems; [the Declaration and Monitoring of Hazardous Waste \(SIDREP\)](#), [the National System for the Declaration of Waste \(SINADER\)](#) and [The National System of Environmental Enforcement Information \(SNIFA\)](#).

1.2 Collection and Disposal

1.2.1 Waste Collection

The municipalities are responsible for collecting, transporting and disposing of waste. Waste collection rates are higher for urban areas (e.g., Santiago de Chile 97%)^{xiv} than for rural areas (30%). All in all, 96% of the Chilean population is serviced with waste collection. Many Chileans live in tall vertical buildings which are the ideal location for testing large domestic collective systems (referred to as GRANSIC). For example, the municipality of Providencia has created the first pilot

plan covering 58,000 apartments to test how a massive collection system for recycling operates^{xv}.

Waste collection and transportation are as yet highly inefficient and expensive. These services are executed by 15 companies all around Chile. Two groups: Dimensión and Starco-Demarco cover 46% of the market. The average cost of the collection and transportation service is around CLP \$ 22,000 (USD 35) per ton^{xvi}. Waste is collected door-to-door in plastic bags by trucks. The informal sector is highly active with at least 60,000 operating waste pickers.

1.2.1 Waste Disposal

In Chile, more than 70% of Municipal Solid Waste is disposed of in authorized facilities. This means that around 16 million tons of waste generated each year ends up in sanitary landfills. The Ministry of Environment (MMA) estimates that only 2% of Municipal Solid Waste is recycled. The reason is that for the municipalities it is more expensive to recycle than to take it all to the landfill. Regarding final disposal, the average cost of the service is CLP \$ 10,918 per ton (around USD 17 per ton)^{xvii}. Four sanitary landfills operate in the Santiago Metropolitan Region that receive MSW. According to SUBDERE^{xviii} in 2019, there were 79 illegal dumpsites^{xix} in the Metropolitan Region, and 600 micro dumpsites. In this regard, Dutch companies have extensive expertise on the extension of the useful life of existing landfills and the development of new sustainable landfills.

1.3 Value Chain

1.3.1 Recycling

Each year in Chile, approximately 990,000 tons of plastic are consumed, of which 84,000 tons (8%) are recycled. About 17% of total recycled plastic waste originates from MSW^{xx}. There are 7,277 drop-off points for recyclables in Chile but to date only one of these has a sorting plant. 64% of the plastic recycling plants are located in the Santiago Metropolitan Region. Capacity utilization for grinding and crushing is only 48% and for pelletizing it is only 57%, so it is worthwhile to increase collection.

Proper waste management geared towards recycling will require a change of habits in Chilean culture. Education is key to generate civil involvement in recycling activities. The implementation of Extended Producer

Responsibility (EPR) systems will create a new market and new commitments with consumers. The regulation, to be financed by producers and importers, will typically mean that both collection and recycling targets will have to be met.

It is estimated that Construction and Demolition (C&D) waste represents approximately 34% of solid waste generated^{xxi}. However, there is no consensus figure regarding the exact amount of C&D waste. It is difficult to assess, if only because 9 out of the 16 regions in the country do not have places for authorized disposal of C&D waste. In 2017, only 8.4% of this waste was valorized.

1.3.2 Composting

In line with other countries without separation at source, 58% of the MSW in Chile is organic waste. In addition to this, 1.6 million tons/year of industrial waste comes from the agricultural sector. More than 50% of the material disposed of in Chilean landfills is organic waste. There is only a small number of industrial composting plants concentrated in the central area of the country^{xxii}. Consequently, municipalities outside the central area prefer to take their organic waste to a landfill in their proximity due to cheaper transportation.

Around 13% of the country's municipalities are implementing actions to recover their organic waste. In this regard, organic residues of agro-food conglomerates offer opportunities as well for composting and anaerobic digestion or even for further valorization. The Dutch Waste Transformers (WT) plants, which are small scale modular anaerobic digesters, can be a potentially profitable option for small scale clients (like shopping malls).

1.3.3 Waste to Energy

Chile has 27 power generation plants based on biomass. In most plants, forestry waste is incinerated to produce thermal and electrical energy, in others organic waste is digested to produce biogas. Most of these plants are strategically concentrated in the so called "Biobio" region which, as the name suggests, has a lot of forest activity.

Three biomass energy generation plants operate in the Santiago Metropolitan Region, with a collective installed capacity of over 40 MW: (1) Loma los Colorados sanitary landfill 20.2 MW (KDM Energía

S.A.), (2) Santa Marta Sanitary landfill 19.7 MW (Consortio Santa Marta S.A.) and (3) Lepanto landfill 2.0 MW (Enerkey SpA)^{xxiii}. These three plants depend mainly on residential waste (75%) and also on commercial waste (25%).

Regarding regulatory compliance with emissions, Chile lacks specific regulations for large scale Waste to Energy (WtE) plants. There is a need to create a specific regulatory framework for WtE, aligned with current environmental policies in Chile. Furthermore, linkages should be established between the private sector and the financial sector for the development of viable business models for the development of WtE projects.

Chile wants to become carbon neutral by 2050^{xxiv}. In order to achieve this ambitious target, the country has started to close down its coal-fired plants. In the waste sector, the country could develop regional collaborative arrangements in order to create (economy of) scale for waste collection and treatment as well as for WtE projects. Dutch private companies and public institutions can support this process. The sector will offer significant opportunities due to the ambitious plan that by 2050 no more than 10% of household waste is to be sent to sanitary landfills. Imagine that today this figure stands at 96%^{xxv}. In this spectrum, waste incineration is likely to be projected in metropolitan areas whereas (anaerobic) digestion can be quite localized.

2. Governance on Waste/CE

2.1 Waste Management

In Chile, the Ministry of the Environment (MMA) is in charge of proposing and formulating regulations and plans regarding waste management. On top of this, it provides technical support to municipalities. The Ministry of Health takes care of health issues regarding waste management and is also in charge of special Waste-streams (non-WSW). The Ministry of Housing and Urbanization defines criteria and infrastructure for the valorization of waste and standards at the national level, whereas the Environmental Assessment Service (SEA) manages project authorizations. In organic waste they cooperate with the Ministry of Agriculture. The Ministry of Health regulates the Commission of Drinking Water and Basic Sanitation (CRA).

The regional and local governments are responsible for the execution of waste management services. For this,

the municipalities design a 5-year municipality waste management plan (PGIRS).

2.2 Circular Economy

In 2017, the [National Organic Waste Strategy 2018-2020](#), was approved. The main goal is to grow from the current 1% to no less than 66% of valorization of Municipal Organic Waste by 2040. Unfortunately, this organic waste strategy is not yet supported by any laws, such as the EPR law. It includes goals but no sources of financing.

In 2019, the MMA^{xxvi} together with the Ministry of Economy, CORFO^{xxvii} and ASCC^{xxviii}, launched the [“Roadmap for Circular Economy^{xxix}”](#). A number of topics have already been set in motion, such as a proposal for the gradual implementation of a landfill tax for the disposal of industrial waste in sanitary landfills and also one for municipal waste. Another important topic is defining a role for waste-to-energy, which will be one of the keys to achieving the ambitious targets.

Chile has become an OECD member in 2010. In an effort to meet OECD standards, the country has taken the first steps towards implementing an [“Extended Producer Responsibility \(EPR\)”](#) policy. In 2015, Chile adopted this policy that focuses on six key products: lubricating oils, electric/electronic devices (WEEE), batteries, packaging, newspapers and magazines, and tires. In August 2018, Chile prohibited single-use plastic bags given out by businesses throughout the country. In 2020, the [Plastics Pact^{xxx}](#) was launched. Its main goal is the elimination of unnecessary single-use plastic by making 100% of plastic packaging reusable, recyclable, or compostable.

MMA has also released a Policy for the **Inclusion of Waste Pickers 2016- 2020** and certifying their labor skills. Finally, Chile has adopted a [Construction and demolition waste roadmap 2025/2035](#) that seeks to reduce C&D waste by 70% in 2035. New business opportunities are expected to develop as a result of this. Enforcement of policies will require adequate staffing, implementation of fees and cultural alignment with legislative goals.

3. Financial Aspects

Same as in most countries that have been studied, the waste management and circular economy sector in Chile is underfinanced. However, the country has been

accelerating a transition in this respect since 2005 with the modification of **Decree Law No. 3,063 on Municipal Revenue**. In Chile, household waste management services are generally funded through real estate tax contributions. However, nearly 80% of properties are exempted from paying this tax, so the occupants of these properties do not pay for the collection and disposal of their waste. Decoupling property taxes and waste fees, together with the introduction of a municipal waste tax, could improve the financial situation of the waste sector. Under the EPR law the management of packaging and packaging waste will have to be co-financed by private parties, which is a new revenue stream into the sector.

In Chile, the Global Environment Facility ([GEF](#)) has sponsored renewable energy generation based on biomass and the Inter-American Development Bank ([IADB](#)) has provided grants for waste management. The Undersecretariat of Regional and Administrative Development ([Subdere](#)) also provides financial means for waste management investments. Regarding circular economy the Chilean Ministry of the Environment and the national economic development agency [CORFO](#) support circular activities in Chile^{xxxix} with strategic investments and financial incentives^{xxxix}.

4. Stakeholders

The collection and transport of MSW is mostly carried out by the municipalities. However, under the EPR law producers would be responsible for organizing and funding "Management Systems" for the waste of priority products they introduce into Chile.

It is important to mention that in Chile, private sector companies tend to be part of different associations. For example, the members of the Plastic Pact committee (apart from the Ministry of Environment) are Acoplasticos, ADC circular, the National Movement of Waste pickers of Chile and Industrial Association of Plastic Industry (ASIPLA). These associations represent the plastic producers, the Chilean industry, the waste pickers, and the public service companies, respectively.

The main associations in the sector are:

- [AEPA](#)
- [ADC Circular– Association of Sustainable Consumers of Chile](#)

- [Industrial Association of Plastic Industry \(ASIPLA\)](#)
- [The National Movement of Waste Pickers of Chile \(MNRCH AG\)](#)
- [Association of Msur Municipalities](#)
- [Amusa](#)

5. Dutch–Chilean Cooperation

Chile and the Netherlands have an economic collaboration on several topics, the Paris Agreement being one of them. Examples of fields of collaboration are the better use of water resources, “The Integrated Water Resource Management”^{xxxiii}, and the coastal rehabilitation project called “Building with Nature Solutions”. In addition, there are issues that set the agenda for economic cooperation between both countries such as hydro resources, environment, sustainable cities, circular economy, ports and engineering services^{xxxiv}. Chile and the Netherlands have signed an MOU in the field of water resources management and climate adaptation.

6. Business Opportunities

There are plenty of business opportunities for Dutch companies in the waste and circular economy sector in Chile. Please find below the most important opportunities identified.

6.1 Processing of Organic Waste from Municipal, Industrial and Agricultural Sources

The potential of organic waste is still underutilized, and the country lacks knowledge on the production and application of high-quality compost and biogas. Dutch companies can step in and provide technological and infrastructural solutions for compost and anaerobic digestion and biogas production.

Residual organic waste streams can be composted, digested or find circular applications into biobased products or can be used to fuel the move towards renewable energy. Dutch technology suppliers can support Chile in the valorization of organic waste, starting with industrial waste flows, and produce compost, and renewable energy (biogas). As the vast majority of Municipal Organic Waste is still landfilled, the extraction and use of gas from landfills is an opportunity. The Netherlands has developed efficient techniques for gas extraction, processing and use, some

of which are inherently profitable. In addition, Dutch Waste Transformers (WT) plants offer an opportunity for small scale companies to become energy efficient through anaerobic digestion of their organic waste. In the Netherlands there are several companies active in selling their equipment for WT.

6.2 Recycling Technologies, for EPR Packaging, Tires and Waste Electrical and Electronic Equipment (WEEE)

In the coming years in Chile, EPR-systems for tires, WEEE and packaging waste must comply with higher targets. Private companies operating these systems are looking for quality equipment (collection, sorting, upgrading and application in the production process) and collaborative approaches in the value chain, a key expertise of Dutch companies. In the field of packaging, design for reuse, recycling technology and new biobased materials are other opportunity areas.

An opportunity that gets momentum under the new EPR law is Dutch technology solutions for end-of-life tires. The Chilean mining sector has its fair share of (giant) tires. Dutch companies can also help their counterparts in Chile with their know-how (consultancy) on how to smoothly design and operate an EPR system for tires.

6.3 Processing of Construction and Demolition (C&D) Waste

C&D waste is getting increased attention in virtually all countries studied by the project team. Chile has taken this a step further: it has set a target of a 70% reduction of C&D waste by 2035, with a special focus on the fast-growing urbanized areas. Cities are looking for local and regional collection and recycling systems and technology to solve the problems caused by illegal dumping of mixed waste in rivers and other ecosystems.

On top of this, the construction sector offers opportunities for Dutch companies active in the first phase of the building lifecycle. Chile lacks knowledge on how to close the loop of building materials, starting at the design phase (eco-design) and leading up to standards for recycling and aggregates that can be reused in the built environment. Dutch architects, consultants and suppliers of sustainable construction materials can fill this void.

7. Concluding Remarks

The Chilean waste and circular economy sectors are developing quickly, creating multiple business opportunities, especially with private sector entities. However, Dutch technology costs tend to be relatively high compared to the competition. It is therefore important to stress the life cycle costs and positive external effects such as environmental benefits of products and to look for customers who prefer quality over the lowest initial investment cost.

In Chile, the municipal waste market is a tender driven market that requires a trustworthy local partner with a strong local network. Apart from large private waste producers (agro-food cooperatives, construction firms or mining companies) and EPR organizations, one focus area is on the fast-growing cities with increasing rates of waste generation. The municipal solid waste and industrial waste landfill diversion targets offer opportunities for collection and sorting/recycling of dry recyclables, as well as composting/digestion/high-end valorization of the organic waste, among others. In this regard, the Netherlands has developed advanced collection, logistics and transfer technologies that can help Chile to decisively improve its waste management sector.

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