

# Waste Management in the LATAM Region

20210208 report Waste Management Study LATAM

## Waste Management Country Report: Mexico

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



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# MEXICO

## Country Information

Whilst Mexico is known for its delightful and spicy food, its mariachi bands and its fantastic beach destinations such as Cancun and Acapulco. Drug cartels are also part of this list, unfortunately. The size of Mexico and its diversity are daunting. On average, the 32 Mexican states are bigger in size than the Netherlands. With around 23 million inhabitants, Mexico City Metropolitan Area is one of the biggest urban centers in the world, with all the associated challenges in public services such as waste management.

The new president, Mr. López Obrador, is focused on boosting social spending and public investment, while maintaining fiscal caution. The previous administration focused on promoting affordable and clean energy. For the current administration however, this is not a priority. This administration is working on improving its financial uncertainty because of a slow economic growth recovery, which has worsened due to the COVID-19 crisis<sup>ix</sup>

Key Indicators	
<b>Size</b>	Mexico is 47 times larger than the Netherlands
<b>Population (2019)</b>	127.6 million <sup>i</sup>
<b>Nominal GDP (2019)</b>	USD 1,260 Billion world rank: 15 <sup>thii</sup>
<b>GDP per capita (2019)</b>	USD 20,582 <sup>iii</sup>
<b>Import from the NL (2018)</b>	USD 198 million <sup>iv</sup>
<b>Economic growth (2018)</b>	-2.5% <sup>v</sup>
<b>Ease of doing business rank (2019)</b>	60/190 <sup>vi</sup>
<b>Corruption index (2019)</b>	130/180 <sup>vii</sup>
<b>Unemployment rate (2019)</b>	3.5% <sup>viii</sup>
<b>Currency</b>	Mexican Peso
<b>Time difference NL</b>	-7/-6/-5 hours

## 1. The Waste/CE Market Analysis

### 1.1 Facts & Figures Waste Generation and Composition

In 2017, Mexico generated around 44 million<sup>x</sup> tons of waste, or 0.94 kilograms per person per day. The State of Mexico, Mexico City and Jalisco together generate 28.5% of the country's waste. Approximately 10% of the solid waste generated in Mexico's cities is recycled (Secretariat for the Environment and Natural Resources, [SEMARNAT](#), 2010), whereas 70% ends up in landfills and the remaining 20% is disposed of in illegal dumpsites. (Mexican Institute for Statistics and Geography INEGI, 2018). 70% is household waste, 30% comes from other sources. SEMARNAT reports in 2020 that 46% of the waste is organic in nature, which is relatively low compared to other countries studied by the project team. Moreover, 32% of the waste could be recycled (e.g., cardboard, paper, plastics, glasses) and 22% is residual waste.<sup>xi</sup> Another significant waste stream is Construction and Demolition (C&D) waste, with 6.5

million tons generated annually (SEMARNAT, 2020). Mexico's hospital waste output is around 11,634 tons per year (average figure for 2004-2018). The installed capacity in 38 authorized companies to treat this waste (through incineration, autoclaves etc.) appears to be sufficient. Over 1.1 million tons of e-waste was produced in 2015. 28,900 million tires are disposed of every year, 5% of which get recycled<sup>xii</sup>.

### 1.2 Collection and Disposal

#### 1.2.1 Waste Collection

The Mexico City Metropolitan Area is one of the biggest urban centers in the world. The waste collection coverage there is 100%. The states of Colima, Baja California Sur, Michoacán, Nayarit, Quintana Roo and Sinaloa have the same good coverage. This is why in this report we mainly concentrate on urban waste. In the whole country, the average waste collection coverage rate is 87%<sup>xiii</sup>. In most cases, waste is collected with equipment in poor conditions, not suitable for the collection of source-separated waste. In communities

with over 10,000 inhabitants, the private sector is in charge of 41% of the collection services<sup>xiv</sup>. In smaller communities, the public sector does 98%<sup>xv</sup> of the collection. All-over Mexico, a total of 2,516 waste collection service providers are active. Of these, 87% are public entities, 10% private and 3% belongs to the informal sector. 179 out of the 2,467 municipalities are not serviced at all.

Source separated waste collection has been introduced in 144 municipalities of 24 states, such as Mexico City, the State of Mexico and Jalisco, among others. This creates a market for more sophisticated collection and storage equipment. To date, there are very few selective collection plants, which contributes to the low recycling rate. According to SEMARNAT (2020), there are 127 waste transfer stations in the country. In 71 of these the waste is merely transferred onto bigger trucks, whereas in 56 it is also compressed and/or sorted.

### 1.2.2 Waste Disposal

In 2017, in Mexico, 86,350 tons of waste per day were deposited at 2,203 final disposal sites<sup>xvi</sup>. This is almost 72% of the total waste output of the country. The remainder apparently leaks out of the waste chain through illegal dumping, burning etc. 40% of the deposited waste ends up in 82 (bigger) landfills with basic infrastructure in place. Some of these landfills could be suitable for application of biogas extraction and electricity generation in the framework of climate change mitigation measures. This is considered a promising opportunity for Dutch companies. 685 (smaller) sites are basically waste dumps without infrastructure. 1,440 landfills are full and 736 municipalities do not have a dumpsite at all. With landfilling being the final destination of choice for waste in Mexico, there is a lot to do in this sector. Opportunities for Dutch companies include equipment for the extension of the useful life of landfills, the introduction of waste diversion techniques such as post collection separation and the development of new sustainable landfills. In Mexico, due to the COVID-19 crisis, the generation of health waste is 32 tons per day<sup>xvii</sup>. Mexico has 19 incinerators capacity to handle 117,519 tons per year and it has designed a temporary landfill for biological-infectious hazardous waste. At the moment the amount of plastic waste due to lockdowns is increasing rapidly. The promotion of new models of behavior and consumption is essential.

## 1.3 Value Chain

### 1.3.1 Recycling

In Mexico, there are 1,060 collection centers for recyclable materials in 21 states<sup>xviii</sup>. Dry recyclables are treated in 44 of these collection centers. The recyclable waste separation plants are not (yet) financially self-sufficient. They operate thanks to subsidies granted by the federal authorities. There are approximately 5,000 waste pickers (or “pepenadores”). This is not a lot compared to other countries in the region. There are initiatives to integrate these waste pickers in a more formal system of recycling, such as [PETSTART](#). This initiative seeks to improve collection and thus recycling. Unfortunately, not all waste pickers are interested to join in. The pepenadores often are part of an informal network that recycles and sells valuable waste materials to unknown buyers. This situation has hindered foreign investments. If Mexico wants to formalize the sector and increase recycling, the next steps should be “pricing” waste by means of landfill taxation (in the longer term), landfill bans and introducing Extended Producer Responsibility<sup>xix</sup>

### 1.3.2 Composting

As stated previously, organic waste makes up 46% of the total in Mexico. There are 24 plants for the treatment of organic waste (considering urban, agricultural, livestock and forestry sectors). 19 of these plants carry out composting and five of them bio-digestion. Seven composting plants are located in Mexico City, another four composting plants are located in the State of Mexico. The [Bordo Poniente](#) composting plant processes an average 1,374 tons per day of organic waste. 1,251 tons per day comes from home collection and large generators, with a compost production of 269 tons per day. The other plants in Mexico City together process 26 tons per day<sup>xx</sup>. Puebla has two anaerobic digestion plants. One of these plants is considered to be the most advanced municipal solid waste (MSW) processing plant in Mexico [developed by Van Dyk](#) solutions. This is a Dutch company which markets Bollegraaf/Lubo equipment and recently expanded its services to Latin America. There is a lack of expertise on composting technologies to recover nutrients from food waste and the organic fraction of MSW. Mexico can benefit from Dutch knowledge and technology in modern high performing composting facilities such as



wet and dry anaerobic digestion, source separated organics, and food waste or manure.

### 1.3.3 Waste to Energy

Mexico has a legal framework that allows the generation and commercialization of electricity by private parties. However, waste to energy (W2E) is still largely unexplored. The Energy Secretariat (SENER) has stated that by 2031, 56 GW of new capacity will have to be added to the power grid. 38.2% of total power has to be generated through clean sources by then. Waste to Energy could become a useful component of the clean energy mix. However, the Mexican Transition Law does not consider waste as a source of clean energy (except biomass residues).

The Mexico City Metropolitan Area produces sufficient waste to justify a feasibility study for large scale waste incineration. Mexico City has performed a feasibility study to design a large-scale thermal-valorization plant, called “[El Sarape](#)”. However, this project was cancelled due to the high costs of implementation<sup>xxi</sup>. The current administration has been investing in the economic recovery of [PEMEX](#) and [CFE](#) which are the main energy companies in the country. An adverse effect of this is that it makes it harder for private sector players in renewable energy to compete on the energy market. On top of that, several biogas plants have failed because of a lack of expertise. Momentum is building for a 400 tons per day [MSW biogas plant in the municipality of Naucalpan](#), which is backed up with feasibility studies funded by GIZ, the US and the Climate and Clean Air Coalition (CCAC)<sup>xxii</sup>. Additionally, Veolia has partnered in Mexico in some municipalities with small-scale plants that represent lower investment risks for the company. [The plant in San Luis Potosí](#) is one of these initiatives. For these kinds of projects to scale up there is a need for municipalities to be willing to work with the private sector. In addition, mechanisms to protect private companies by means of concessions should be developed (with long term operation periods, guaranteed delivery of waste and at fixed prices).

So far in Mexico, landfills and energy-rich residues produced by large companies (from the tequila, corn milling and meat industry) are sparsely used as a source of biogas or combustion. There are 8 to 10 landfills in Mexico where biogas is used as a source of energy. SIMEPRODE in Monterrey is the biggest. This field offers opportunities to Dutch companies, which have

expertise in the extraction and use of gas from landfills. It is recommendable to start with off-grid applications with the Mexican private sector. In some cases, business models are inherently profitable, especially if applied in the framework of climate change mitigation measures.

## 2. Governance on Waste/CE

### 2.1 Waste Management

In Mexico, In Mexico, the waste management sector is organized according to three types of waste. Firstly, municipalities are responsible for the management of municipal solid waste (MSW). Secondly, states are in charge of special waste streams such as tires, C&D waste, water treatment sludges, etc. Lastly, federal authorities organize the management of hazardous waste (including medical waste). In the Mexican system, with some exceptions the 2,457 municipalities do not charge fees for the collection, treatment and disposal of waste, which is an impediment to correct waste management. Municipal councils change every three years, affecting the vision, planning and waste management projects. The Secretariat of Environment and Natural Resources ([SEMARNAT](#)) does make an effort to professionalize the waste management sector. The Mexican municipalities consist of a small network of local offices with untrained staff and financial challenges. However, our findings suggest that municipalities can help investors overcome local, social and cultural barriers.

The General Law for the Prevention and Comprehensive Management of Waste (2003) promotes the recovery of waste and minimizes the impact on the environment and on human health. In 2009, the federal government published the National Program for the Prevention and Management of Waste (PNPGIR) which has increased the participation of the states, municipalities and the private sector in waste management. However, progress is still incipient and requires constant government actions to improve waste management systems. The National Vision towards Sustainable Management: [National Zero Waste Vision](#) (2019) is another initiative which addresses circular economy, commitment to anti-corruption and transparency in public management and social welfare. In Mexico, Extended Producer Responsibility (EPR) is not yet being applied as a policy instrument in waste management. Formally, there is only a shared responsibility for the producer since 2003. SEMARNAT and UNDP are carrying out the study: “A

proposal for the implementation of EPR for waste of electronic devices<sup>xxiii</sup>. If this initiative evolves into an EPR system for WEEE, followed by other recyclables, then a new array of opportunities will open up for Dutch exporters.

## 2.2 Policy Landscape: Circular Economy

In 2019, the [state government of Mexico City announced an Action Plan for Circular Economy](#). The main objective is to achieve zero waste. This plan introduces regulations to reduce the amount of packaging and single-use products, proper waste management processes and infrastructure, the creation of cooperatives and microenterprises specializing in waste management, as well as zero-plastic waste education campaigns<sup>xxiv</sup>. At a federal level, there is an ongoing [policy initiative](#) to promote circular economy in the water and energy sector. However, there are many legal and investment challenges to overcome<sup>xxv</sup>.

## 3. Financial Aspects

The waste sector in Mexico is underfinanced. The cost of waste management has to be covered through general municipal funds mostly. At some point, it is important to create a federal law that makes it compulsory for the municipalities to collect a waste fee. In Mexico, in the period 2013-2018, USD 2,373 millions of federal funds were allocated to finance 346 projects in support of integrated waste management. Currently the investment in the sector has decreased, especially as a result of COVID-19. The energy transition and sustainable use of energy fund (FOTEASE) plays a role in Waste to Energy projects. The National Bank of Public Works and Public Services financially supports the solid waste program (PRESOL). External sources of funding include the Global Environmental Facility (GEF), the World Bank (WB), the Inter-American Development Bank (IDB) and the European Investment Bank (EIB).

## 4. Stakeholders

In Mexico, 247 private companies offer waste collection, transportation and disposal services. Of the 127 registered transfer stations, 29 are operated by the private sector. The only specific management system for special waste is operated by private providers. However, not all generators of this type of waste contract the services of private companies, as they tend to be more expensive than the municipalities. The reason for this is

that private companies often calculate projects with a higher internal rate of return (IRR). Often, public services do not pay a value added tax, which gives them a competitive advantage.

The following organizations play an important role in the sector:

[ANIPAC](#),

[ANILLAC](#)

[CNBIOGAS](#)

[CANIETI](#)

[ANFAD](#)

[Veolia Mexico](#)

[PETSTAR](#)

[ANIQ](#)

## 5. Dutch–Mexican Cooperation

In 2018, The Netherlands and Mexico signed six agreements that will strengthen commercial relations and cooperation in the management of natural resources, infrastructure and trade<sup>xxvi</sup>. Additionally, in 2020, Mexico and the Netherlands have joined forces to promote innovation in the horticultural sector by holding a trade mission aimed at enhancing technological cooperation and expanding trade between both nations, given their advances in innovation in agriculture. An example of this cooperation is the applied research on the Mexican greenhouse industry to develop a sustainable Agro-food chain, financially supported by [Topsector Agri & Food](#)<sup>xxvii</sup>.

## 6. Business Opportunities

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

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

Mexico's food losses amount to 37% of the food produced in the country. Clearly there is opportunity and a need to improve food waste management. There are several initiatives in composting and anaerobic digestion, but the country lacks knowledge on how to

scale up the application of these technologies and develop new business models. In addition, in Mexico there is a lot of untapped potential when it comes to the waste of the tequila, corn milling, meat and dairy sectors as a source of compost and biogas production. This potential is the product of the lack of both will and legal stability, lack of trained staff and financial resources to implement energy recovery projects. However, Dutch technology suppliers can support Mexico in the valorization of organic waste. Examples are digestion (source of renewable energy and the digestate as fertilizer) or high-end valorization of organic waste into biobased products (biobased plastics). Same for the landfill's gas extraction. Dutch companies have a lot of expertise in these areas and can introduce business models that are inherently profitable.

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

In the coming years, it is expected that Extended Producer Responsibility (EPR-) systems for WEEE, tires and packaging waste must be developed and implemented, together with clear recycling targets. The amount of e-waste is growing rapidly from the current 2.52 kg per person per year. Its management leaves much to be desired. Only 5% of used tires are currently recycled. There is a lot of experience with handling these waste streams in the Netherlands. Therefore, there is an opportunity for Dutch companies to introduce these techniques in Mexico. In 2005, the packaging industry in Mexico signed the Global Pact. As a result, substantial investment and great changes are expected within the value chain. Private companies (including multinationals) will be looking for quality equipment (collection, sorting, upgrading and application in the production process) and collaborative approaches in the value chain, which is a key expertise of Dutch companies.

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

The volume of Construction and Demolition (C&D) waste is increasing fast. Stationary and mobile C&D waste processing plants have been introduced in Mexico. Stationary plants have a typical capacity of between 100 to 350 tons/h. The initial investment in such plants is

very high. Mobile plants typically do 100 tons/h through more basic technologies. They are economically feasible, but the recycled product tends to be of a lower quality. Given the low reuse and recycling percentages of C&D waste in Mexico, opportunities are high for the installation of crushing plants and the selection of aggregates for their future use in construction or civil works. Besides, the construction sector offers opportunities for Dutch companies active in the first phase of the building life cycle. Mexico lacks knowledge on how to close the loop of building materials, starting at the design phase (eco-design). Dutch architects and suppliers of sustainable construction materials can fill this void.

## **7. Concluding Remarks**

The Mexican waste and circular economy sector is developing slowly but steadily, creating promising business opportunities, especially with private sector entities. Some opportunities are in consultancy services, both in waste management and the circular economy. The national government needs to update its legal structure for special waste management which currently does not allow for its integrated utilization. There is a need to formalize and to transform the role of the informal sector which is essential for increasing efficiency in both recycling and material recovery in the country. Additionally, there is a need for reliable data systems and improvement of regional municipal cooperation, and a need to invest in and operate waste collection, transport and treatment/disposal. In both areas, the public and private players from the Netherlands have a lot to offer.

The Mexican market is characterized by complexity. The lack of transparency in the waste management processes can be a barrier. For example, the bidding processes are neither open nor monitored. Additionally, the needed high investments and the short tender period do not always match. However, Dutch companies usually do not provide solutions for the whole chain. Therefore, Dutch companies can team up with local or other foreign companies to become more successful. Another factor that adds complexity is the lack of regulation and enforcement to provide stability and protection to foreign private companies.

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