



# Mexico Waste Sector Methane Analysis Factsheet

**Mexico is the second largest municipal solid waste generator in the Latin American and Caribbean (LAC) region, after Brazil.**

Its waste sector—which includes solid waste and wastewater—contributed to **28% of annual national methane emissions** in 2021.<sup>1</sup> Like many other countries in the LAC region, Mexico faces the enormous task of managing its solid waste in an environmentally and climate-friendly way. In 2024, CATF published the [Mexican Waste Sector Methane Analysis](#), which assesses waste management in Mexico and explores solutions to improve practices and reduce methane emissions. This factsheet highlights key findings from the analysis.<sup>2</sup>

## Mexico's Waste Methane Emissions

### 9%

In 2021, Mexico's waste sector contributed to **9% of total greenhouse gas (GHG) emissions** or 63.8 million metric tonnes of carbon dioxide equivalent.

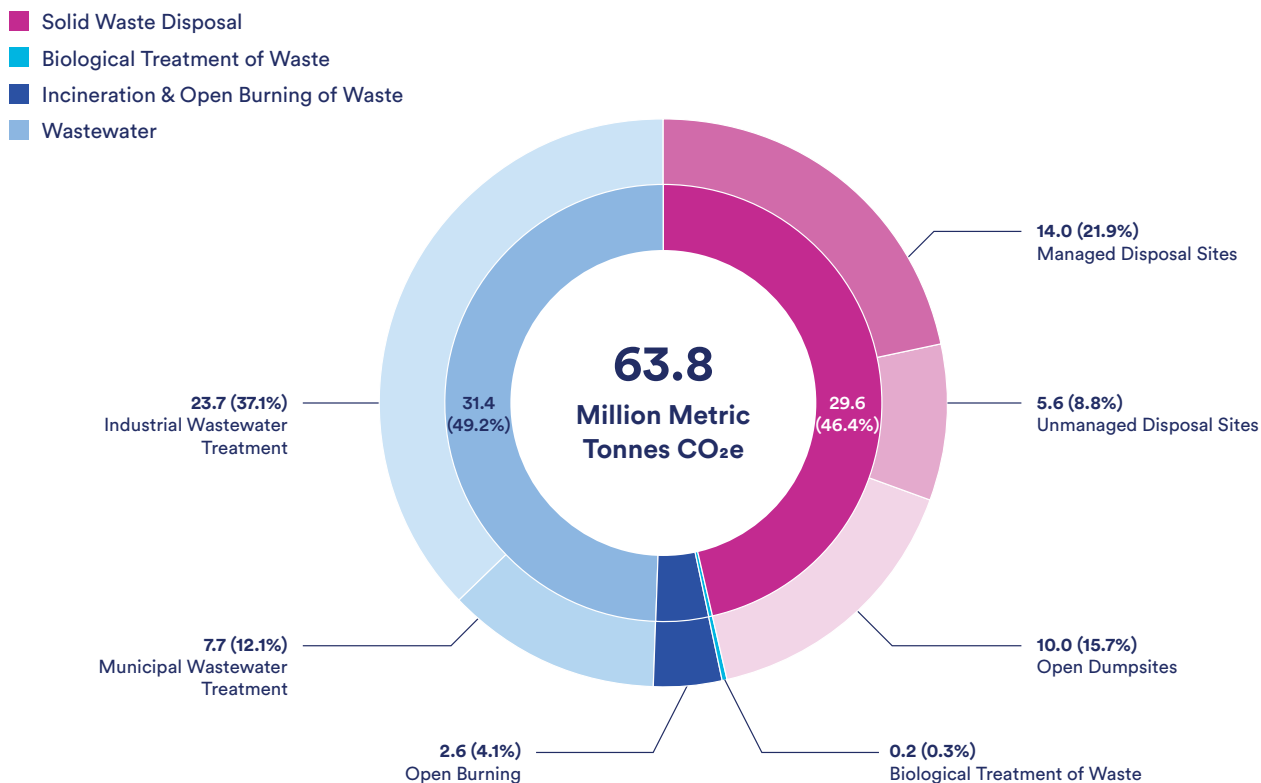
### 46%

Of the total waste sector GHG emissions, **46% stem from solid waste disposal** (i.e., managed and unmanaged disposal sites, as well as open dumpsites).

### 89%

On average, 89% of GHG emissions from waste in Mexico are **methane**.

## Mexican Waste Sector GHG Emissions in 2021<sup>3</sup>



## Institutional Framework for Waste Management and Methane Mitigation

The two main laws that regulate solid waste in Mexico are the **General Law of Ecological Balance and Environmental Protection** and the **General Law for the Prevention and Integrated Management of Waste (LGPGIR)**.<sup>4</sup> These laws assign waste management responsibilities across federal, state, and municipal levels. The **Regulation of the LGPGIR (RLGPGIR)** helps operationalize the LGPGIR and sets requirements for waste management plans for bulk waste generators, among others.<sup>5</sup> Standards for solid waste management are established through Official Mexican Standards (NOM) and, generally, set technical requirements. Key NOMs include **NOM-004-SEMARNAT-2002**, **NOM-083-SEMARNAT-2003**, and **NOM-161-SEMARNAT-2011**.<sup>6</sup> In addition to NOMs, Mexican Standards (NMX) support testing and analytical procedures, and Reference Standards are used when no applicable NOMs or NMX exist. Policies such as the **2022–2024 National Program for the Prevention and Integrated Management of Waste** and the **National Vision for Sustainable Zero Waste Management** emphasize source segregation, organic waste treatment, and circular economy approaches.

Mexico has also embedded methane mitigation within its climate policy framework, including commitments under the Global Methane Pledge and a 2023 agreement with the U.S. and Canada to reduce methane emissions from the waste sector by 15% by 2030. The **General Law on Climate Change** (LGCC) mandates municipalities to build infrastructure that prevents methane emissions from solid waste and, where feasible, to harness landfill gas for electricity generation, supported by programs promoting waste-to-energy and biogas initiatives.<sup>7</sup> In addition, the LGCC set a GHG mitigation target for the waste sector of 28%.<sup>8</sup> Mexico is in the process of updating its Nationally Determined Contribution and its 2035 goals, to achieve this goal significant and rapid reductions from methane will be needed.

## Solid Waste Management in Ecuador

|                                |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Generation</b>              | More than 47 million metric tons of municipal solid waste were generated in 2022. <sup>9</sup> Organic waste accounts for 46% of the waste stream. <sup>10</sup>                                                                                                                                                                                                                                              |
| <b>Collection</b>              | In 2017, 84% of total waste generated was collected, while the rest were openly burned or dumped. <sup>11</sup> Source segregated collection of organic waste is limited, hindering proper treatment. Collection vehicles unload their waste at transfer stations, which are often improperly managed. 90% of collected waste goes to final disposal without passing through transfer stations. <sup>12</sup> |
| <b>Recycling and treatment</b> | 32 metric tons per day of recyclables (mostly paper, cardboard, and glass) are dropped off by individuals and collection services at recycling in 2022. <sup>13</sup> Only about 7% of the organic waste generated in the country is composted or treated via anaerobic digestion. <sup>14</sup>                                                                                                              |
| <b>Final Disposal</b>          | In 2022, Mexico had 2,250 final disposal sites receiving 35 million metric tons of waste. <sup>15</sup> There are less than 100 sanitary landfills with capacity to use landfill gas. <sup>16</sup>                                                                                                                                                                                                           |

# Challenges and Opportunities

Mexico's rapidly growing population and waste generation make waste management a persistent and complex issue. Although the country has laws, programs, and financial mechanisms to support waste infrastructure and GHG mitigation targets, current efforts to manage organic waste and reduce methane emissions remain inadequate. Addressing ongoing challenges—such as limited data quality, inadequate source separation, underdeveloped treatment capacity, and insufficient financing—offers a clear pathway to strengthen integrated waste management and emissions reductions goals.

## Key Stakeholders

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-  **Secretariat of Environment and Natural Resources (SEMARNAT):** Develops and oversees the National Prevention and Integrated Management of Waste Program (PGIR) and the Basic Diagnosis for Integrated Waste Management (DBGIR). Responsible for setting standards and managing data systems on waste management.
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-  **Municipal Governments:** Manages household municipal solid waste and develops Municipal Prevention and Integrated Management of Waste Programs (PMPGIRSU).
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-  **State Governments:** Develops, evaluates, implements state policies in accordance with the PGIR; promotes programs and infrastructure development for waste management. Manages bulk waste generators.
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-  **Federal Congress:** Updates the LGPGIR and sets climate budgets.
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-  **National Institute of Geography and Statistics (INEGI):** Develops data and statistics on generation, composition, and management of household municipal solid waste.
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-  **INECC:** Develops emission inventories, sets Mexico's NDC, and conducts MSW research.
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-  **Secretariat of Energy:** Manages energy programs, sets standards and issues permits for energy-related projects, including landfill biogas projects.
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|                                                  | Challenges                                                                                                                                                                         | Stakeholder(s)                                                                                                                                                                                                                                        | Opportunities                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emissions Visibility                             | Lack of reliable data on waste volumes.                                                                                                                                            |                                                                                                                                                                      | Require the installation of weighing scales at transfer stations, treatment facilities and disposal sites to track waste volumes; Periodically conduct monitoring and verification activities on waste volumes disposed.                                                                                    |
|                                                  | Lack of planning and coordination between government agencies, leading to inconsistent reporting between official documents and outdated census data for national level reporting. |    | Facilitate the development and use of a data platform for municipalities and disposal site operators to share periodic detailed data on waste; coordinate in the elaboration of official documents to ensure the most up-to-date data is used and there is consistency throughout national level reporting. |
|                                                  | Little use of advanced monitoring and measurement to detect leaks, prioritize mitigation opportunities, or improve inventory estimates.                                            |                                                                                                                                                                      | Collaborate with the National Council for Humanities, Science and Technology, civil society, and academia to incorporate remote sensing observations and ground-based measurements into official inventory processes.                                                                                       |
| Finance                                          | Lack of capacity to conduct cost analyses and technical studies.                                                                                                                   |                                                                                                                                                                      | Incorporate cost analyses to better understand expenses, and the development of technical studies to scope improvements in their PMPGIRSU.                                                                                                                                                                  |
|                                                  | Lack of an effective fee system to fund waste management.                                                                                                                          |                                                                                                                                                                      | Encourage municipalities to establish a fee system in which recuperated funds are reinvested in waste management.                                                                                                                                                                                           |
|                                                  | Limited capacity and guidance to identify funding and prepare successful funding applications for waste projects.                                                                  |                                                                                                                                                                      | Regularly identify and publicize available international funding; coordinate with state and municipal governments to access funding and monitor projects.                                                                                                                                                   |
|                                                  | Weak regulatory framework for organic waste diversion and treatment.                                                                                                               |                                                                                                                                                                      | The National Infrastructure Fund and National Infrastructure and Public Service Bank should improve outreach on available federal funds and provide guidance to municipalities throughout the application process.                                                                                          |
| Enabling Policy and Regulatory Framework         | Outdated regulatory instruments and lack of a clear roadmap for GHG reductions that hinder continuity across government administrations.                                           |                                                                                                                                                                    | Update technical regulations and standards to incorporate the most up-to-date technologies and practices for waste management; establish a roadmap towards achieving sectoral GHG targets to be considered in the development of PMPGIRSU and state program                                                 |
|                                                  | Lack of market incentives and clear policies for landfill gas and anaerobic digesters.                                                                                             |                                                                                 | Create policies and market incentives, which result in a competitive price for products; publish regulations and policies to facilitate energy use from landfill gas and anaerobic digesters.                                                                                                               |
|                                                  | Hgih staff turnover and loss of expertise throughout the administration.                                                                                                           |                                                                                                                                                                    | Identify staff needs and capacity strengthening requirements to include in PMPGIRSU; ensure solid waste management is supported throughout the administration.                                                                                                                                              |
|                                                  | Limited community and waste sector worker participation in waste project planning process.                                                                                         |                                                                                 | Consult local communities and waste sector workers in the planning and development of waste management projects.                                                                                                                                                                                            |
| Stakeholder Awareness and Capacity Strengthening | Limited resources for conducting trainings.                                                                                                                                        |                                                                                 | Provide trainings to municipal government staff, waste sector workers, and local communities on best practices for solid waste management and methane mitigation.                                                                                                                                           |
|                                                  | Lack of public awareness and education on the waste sector and its impacts on climate change                                                                                       |                                                                                                                                                                    | Conduct communication campaigns on the importance of waste prevention, source separation, and other steps waste generators can take to minimize their impact on the sector; particular focus should be provided at schools of all levels.                                                                   |

# References

- <sup>1</sup> INECC. (2023). Inventario Nacional de Emisiones de Gases y Compuestos de Efecto Invernadero (INEGYCEI) 2020-2021. [https://www.gob.mx/cms/uploads/attachment/file/853373/10-2023\\_INEGYCEI\\_2020\\_2021.xlsx](https://www.gob.mx/cms/uploads/attachment/file/853373/10-2023_INEGYCEI_2020_2021.xlsx)
- <sup>2</sup> Waste generation is calculated based on total waste collected in 2023 and the national collection coverage of 84%. INEGI. (2024). Censo Nacional de Gobiernos Municipales y Demarcaciones Territoriales de la Ciudad de México 2023. <https://www.inegi.org.mx/programas/cngmd/2023/#tabulados>. SEMARNAT. (2020). Diagnóstico Básico para la Gestión Integral de los Residuos (DBGIR). Ciudad de México
- <sup>3</sup> INECC. (2023). Inventario Nacional de Emisiones de Gases y Compuestos de Efecto Invernadero (INEGYCEI) 2020-2021. [https://www.gob.mx/cms/uploads/attachment/file/853373/10-2023\\_INEGYCEI\\_2020\\_2021.xlsx](https://www.gob.mx/cms/uploads/attachment/file/853373/10-2023_INEGYCEI_2020_2021.xlsx)
- <sup>4</sup> Gobierno de México. (2023). Ley General para la Prevención Integral de Residuos. <https://www.diputados.gob.mx/LeyesBiblio/pdf/LGPGIR.pdf>; Secretaría de Economía. (2016). Standards. Gobierno de México. <https://www.gob.mx/se/acciones-y-programas/standards>
- <sup>5</sup> Gobierno de México. (2014). Reglamento de la ley General para la Prevención y Gestión Integral de los Residuos. <https://www.gob.mx/profepa/documentos/reglamento-de-la-ley-general-para-la-prevencion-y-gestion-integral-de-los-residuos>.
- <sup>6</sup> Secretaría de Gobernación. (2003). NOM-004-SEMARNAT-2002, Protección ambiental.- Lodos y biosólidos.-Especificaciones y límites máximos permisibles de contaminantes para su aprovechamiento y disposición final. [https://dof.gob.mx/nota\\_detalle.php?codigo=691939&fecha=15/08/2003#gsc.tab=0](https://dof.gob.mx/nota_detalle.php?codigo=691939&fecha=15/08/2003#gsc.tab=0); Secretaría de Gobernación. (2021). NOM-083-SEMARNAT-2003, Especificaciones de protección ambiental para la selección del sitio, diseño, construcción, operación, monitoreo, clausura y obras complementarias de un sitio de disposición final de residuos sólidos urbanos y de manejo especial. [https://www.dof.gob.mx/nota\\_detalle.php?codigo=5617899&fecha=10/05/2021#gsc.tab=0](https://www.dof.gob.mx/nota_detalle.php?codigo=5617899&fecha=10/05/2021#gsc.tab=0); Secretaría de Gobernación. (2013). NOM-161-SEMARNAT-2011, Que establece los criterios para clasificar a los Residuos de Manejo Especial y determinar cuáles están sujetos a Plan de Manejo; el listado de los mismos, el procedimiento para la inclusión o exclusión a dicho listado; así como los elementos y procedimientos para la formulación de los planes de manejo. [https://www.dof.gob.mx/nota\\_detalle.php?codigo=5286505&fecha=01/02/2013#gsc.tab=0](https://www.dof.gob.mx/nota_detalle.php?codigo=5286505&fecha=01/02/2013#gsc.tab=0)
- <sup>7</sup> Gobierno de México. (2024). Ley General de Cambio Climático. <https://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC.pdf>
- <sup>8</sup> Note that the 22% reduction of total GHG emissions was included in 2018, but Mexico's most recent NDC sets an unconditional mitigation target of 35%.
- <sup>9</sup> Waste generation is calculated based on total waste collected in 2023 and the national collection coverage of 84%. INEGI. (2024). Censo Nacional de Gobiernos Municipales y Demarcaciones Territoriales de la Ciudad de México 2023. SEMARNAT. (2020). DBGIR. Ciudad de México
- <sup>10</sup> SEMARNAT. (2020). DBGIR. Ciudad de México. <https://www.gob.mx/cms/uploads/attachment/file/554385/DBGIR-15-mayo-2020.pdf>
- <sup>11</sup> SEMARNAT. (2020). Diagnóstico Básico para la Gestión Integral de los Residuos. Ciudad de México.
- <sup>12</sup> INECC. (2022). Atlas Nacional de Residuos Sólidos Urbanos. Ciudad de México. [https://www.gob.mx/cms/uploads/attachment/file/693803/125\\_2022\\_Atlas\\_Nacional\\_Residuos\\_Solidos.pdf](https://www.gob.mx/cms/uploads/attachment/file/693803/125_2022_Atlas_Nacional_Residuos_Solidos.pdf)
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- <sup>16</sup> SEMARNAT & INECC. (2022). México: Tercer Informe Bial de Actualización ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático.