

Plastic Lifecycle Assessment Calculator for the Environment and Society (PLACES) Latin America and the Caribbean

Summary of Findings

October 2025

CONTEXT

The most recent negotiations of the Global Plastics Treaty ended without an agreement. As such we continue to lack the global policies, rules, and norms that are critical to combating plastic pollution. Plastic waste contributes to a variety of environmental, social, and human health impacts, one of which is climate change. The life cycle of plastics, from production through consumption to end of life (EOL), contributes roughly 4% of global greenhouse gas (GHG) emissions.¹ Reducing plastics production is essential to driving down GHG emissions, as is better management of plastics at EOL.

In 2021, The Circulate Initiative developed the Plastic Lifecycle Assessment Calculator for the Environment and Society (PLACES) to enable buyers of recycled plastic such as brands, recyclers, policy makers, and other stakeholders to better understand the environmental impacts of different EOL plastic waste management methods, including open burning, waste-to-energy, and recycling. The initial version of PLACES covered six countries in South and Southeast Asia. We have since updated it to include four countries in Latin America and the Caribbean: Brazil, Colombia, the Dominican Republic, and Mexico. PLACES covers three impact areas: energy consumption, GHG emissions, and water consumption.

The full results and methodology can be found in the Life Cycle Assessment Methodology and Results [document](#). This document includes additional data, such as a breakdown of polymer types and the environmental impact factors (e.g., GHG emissions factor) in each country.

KEY FINDINGS

1

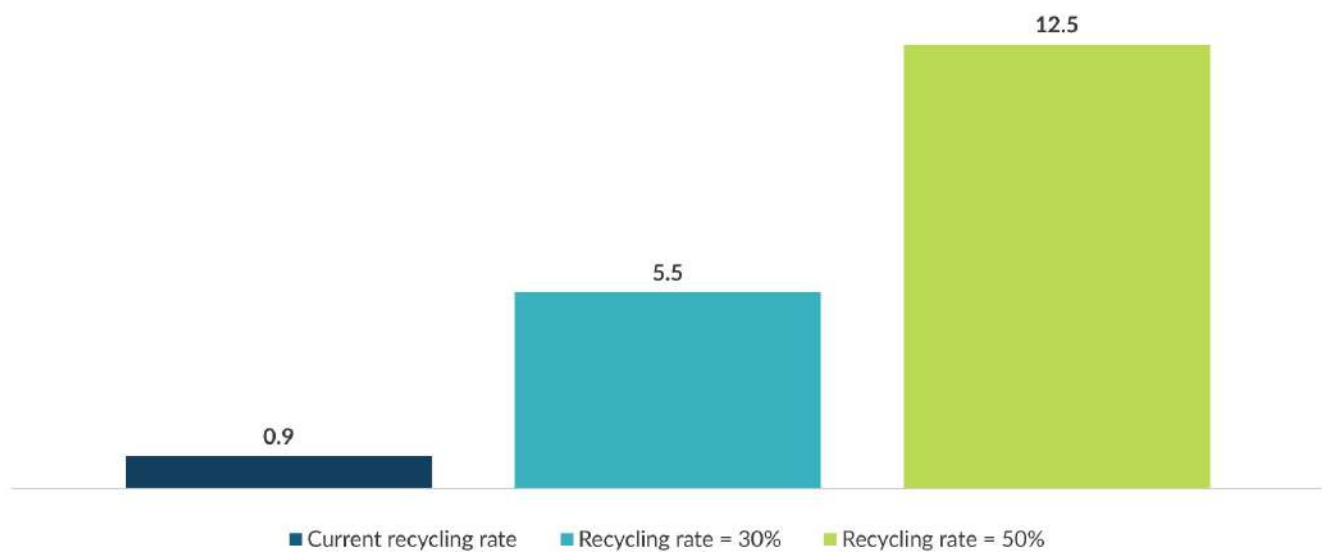
Increasing recycling rates to 30% across the four countries could reduce GHG emissions by 5.5 million tonnes – the equivalent of taking 1.2 million cars off the road every year

Increasing recycling rates modestly in each country (to 30%) would have significant environmental benefits. For context, recycling rates in Brazil, Colombia, the Dominican Republic, and Mexico are 21%, 13.3%, 5.7%, and 15.7% respectively. Currently, recycling reduces GHG emissions by roughly 0.9 million tonnes across the four countries. Increasing the recycling rate to 30% would reduce emissions by 5.5 million tonnes per year, which is the equivalent of taking 1.2 million cars off the road every year.² Increasing recycling to 50% across the countries could reduce emissions by 12.5 million tonnes CO₂e.

¹ The Plastics & Climate Project. (2025). *Plastics: Exposing Their Climate Impact* [online]. Available from: https://www.plasticsandclimate.com/files/ugd/261d9f_f35f6cfa5e542a1bf6859d757e7da49.pdf

² United States Environmental Protection Agency. (2024). *Greenhouse Gas Equivalencies Calculator* [online]. Available from: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>. Note: As the US EPA GHG equivalencies calculator was developed based on US-specific data, this number provides an approximate frame of reference for the reduced GHG emissions.





GHG reductions from recycling (million tonnes CO₂e), all countries



2 Open burning of plastic waste is 15 times more GHG intensive than sanitary landfills and open dumps, and generates more GHG emissions than are saved through recycling

The open burning of plastic waste generates 15 times more GHG emissions per kilogram (kg) than sanitary landfills and open dumps. Open burning generates more GHG emissions than are saved through recycling (2.75 kg CO₂e vs. 2.37 kg CO₂e saved). Our analysis does not factor in the human health impacts of openly burning plastic, which according to the World Health Organization may include coughing, skin irritation, and respiratory diseases.³ Burning plastic also eliminates the economic value inherent in plastic materials.

GHG emissions, kg CO₂e per kg plastic managed⁴

	Sanitary Landfill	0.18
	Open Dump	0.17
	Open Burning	2.75
	Recycling*	-2.37







*For recycling, -2.37 kg CO₂e includes emissions from transportation and processing of recyclables (0.46 kg CO₂e), and reduced emissions from displaced primary plastic production (-2.83 kg CO₂e).

3

Even at relatively low rates, open burning of plastic waste in Brazil and Mexico drives a significant share of GHG emissions

Given the emissions intensity of open burning, it results in a disproportionate share of total GHG emissions. In Brazil, less than 5% of plastic waste is openly burned, yet this accounts for 42% of all GHG emissions from managing plastic waste at EOL. In Mexico, the 11.6% of plastic waste that is openly burned generates a staggering 66% of emissions. Given the climate change commitments that Brazil (to reduce net GHG emissions by 59–67% by 2035) and Mexico (to reduce GHG emissions by 35% by 2030) have made, eliminating open burning of plastic waste would be a wise step.

Contribution of open burning to GHG emissions⁵

Country	 % of Plastic Waste, Open Burning	 GHG Emissions from Open Burning, % of all EOL Emissions
	4.9%	41.6%
	0.5%	8.6%
	0.8%	14.6%
	11.6%	66%

⁵ This does not include displaced emissions.

REFLECTIONS

As with the first version of PLACES which focused on countries in South and Southeast Asia, significant GHG reductions are possible through a shift to recycling in Latin America and the Caribbean, particularly from open burning of plastic waste. Given the climate change commitments of the four countries covered in this version of PLACES, recycling can be an important component of their countries' decarbonization strategies. Moving away from open burning and other EOL fates to recycling also provides additional benefits, including improvements in human health, biodiversity, and local economic well-being (i.e., reducing the costs of waste management).

Key climate change and plastic waste commitments of the four countries



Brazil has a goal to reduce net GHG emissions by between 59% and 67% by 2035, with 2005 as the baseline.⁶ Brazil's most recent National Solid Waste Plan has a recycling target of 48% by 2040, which includes plastic. The plan aims to move away from unsanitary landfills or open dumps toward sanitary landfills.⁷



Colombia has committed to limiting emissions to 169.44 million tonnes CO₂e by 2030, which is a 51% reduction from a business-as-usual scenario.⁸ The [National Circular Economy Strategy \(ENEC\)](#) outlines long-term steps to meet green growth goals including increasing recycling rates, a key component of which is extended producer responsibility (EPR).⁹



The **Dominican Republic** has committed to reducing GHG emissions by 27% by 2030.¹⁰ While waste is covered in the Dominican Republic's Nationally Determined Contribution (NDC), plastic waste management is not explicitly mentioned, and the country's plastic waste management policies are relatively nascent.



Mexico has committed to reducing GHG emissions by 35% by 2030.¹¹ As part of this, Mexico has committed to reducing emissions from the waste sector by 28%, achieving zero methane emissions from landfills, and ending the open-air burning of waste.

⁶ Brazil's Nationally Determined Contribution. Available from:

https://unfccc.int/sites/default/files/2024-11/Brazil_Second%20Nationally%20Determined%20Contribution%20%28NDC%29_November2024.pdf

⁷ Equipe GNPW Group. (2024). *National Solid Waste Plan: Brazil's Path to Eradicating Landfills and Promoting Clean Energy* [online]. Available from: <https://www.gnpw.com.br/en/renewable-energy/national-solid-waste-plan-brazils-path-to-eradicating-landfills-and-promoting-clean-energy/>

⁸ NDC Partnership. (2025). *Colombia Nationally Determined Contribution* [online]. Available from: <https://ndcpartnership.org/country/col>

⁹ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (2023). *Circular Economy in Colombia* [online]. Available from: https://www.giz.de/en/downloads/giz2023-Colombia-Reusable-packaging-systems-and-women-participation_150dpi.pdf

¹⁰ NDC Partnership. (2025). *Dominican Republic Nationally Determined Contribution* [online]. Available from: <https://ndcpartnership.org/country/dom>

¹¹ NDC Partnership. (2025). *Mexico Nationally Determined Contribution* [online]. Available from: <https://ndcpartnership.org/country/mex>

REFLECTIONS

Increasing recycling rates across the four countries will require a clear and robust set of policies that help increase the supply and demand for recycled material, for example EPR (supply) and recycled content mandates (demand). As noted in the table above, some of these measures are already in place in the four countries. For example, Mexico enacted national waste legislation in the early 2000s that, along with public-private partnerships and innovative financing, has helped significantly increase PET recycling.¹² Lessons can also be drawn from other regions. In India, investment in recycling is increasing significantly in part due to EPR and recycled content mandates (i.e., rigid plastic packaging must contain 30% recycled content by the end of 2025 and 60% by the end of 2027).¹³

With the types of policies that are being enacted in Latin America and the Caribbean, investors will have the regulatory certainty needed to channel funding toward solutions to plastic waste. Currently, very little capital is flowing to the region relative to other parts of the world and given the scale of the plastic pollution challenge. According to one estimate, there were 3.7 million tonnes of plastic waste available to enter the ocean in 2020 in Latin America and the Caribbean, while the global figure ranges from 5 to 13 million tonnes.¹⁴ However, Latin America and the Caribbean received only 1.2% of all private investment between 2018 and 2024¹⁵ — a glaring mismatch.

Lastly, a transition to a circular economy in Latin America and the Caribbean, including a shift toward increased recycling, will require that the informal sector be an integral part of the transition. Informal waste pickers are the foundation of recycling in many emerging economies. In Brazil for example, they are responsible for collecting 90% of recyclable waste. Increasing recycling rates is dependent on improving the livelihoods of these individuals, which is an overarching objective of the Responsible Sourcing Initiative. In connection with this, and related to PLACES, it is also essential to manage the impacts of climate change on waste pickers, who are increasingly impacted by heat waves and other extreme weather events.

¹² For more information, see the Mexico case study. The Circulate Initiative. (2022). *Unlocking the Plastics Circular Economy: Case Studies on Investment* [online]. Available from: <https://www.thecirculateinitiative.org/research/unlocking-the-plastics-circular-economy-case-studies-on-investment/>

¹³ For more context, see Webinar 4: Key Enablers for Accelerating Investment in Plastics Circularity. World Economic Forum. (2025). The Financing Coordination Group [online]. Available from: <https://initiatives.weforum.org/financing-coordination-group/home>

¹⁴ Brooks, A., Jambeck, J., and Mozo-Reyes, E. (2020). *Plastic Waste Management and Leakage in Latin America and the Caribbean* [online]. Available from: <https://publications.iadb.org/en/plastic-waste-management-and-leakage-latin-america-and-caribbean>

¹⁵ The Circulate Initiative. (2025). Plastics Circularity Investment Tracker [online]. Available from: <https://www.thecirculateinitiative.org/plastics-circularity-investment-tracker>

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