

# THE INTERSECTION OF CLIMATE INVESTING AND CIRCULAR PLASTICS IN SOUTH AND SOUTHEAST ASIA

Preventing All Plastic Leakage in India and Indonesia Could Avoid 150 Million Tonnes of GHG by 2030

## CLIMATE CHANGE IS ONE OF THE HIGHEST PRIORITIES FOR INVESTORS TODAY.

The urgency to address climate change is escalating as global warming now poses an ever-increasing threat to lives, livelihoods, and biodiversity. Greenhouse gases (GHG) in the atmosphere have risen to record levels not seen in three million years.<sup>1</sup> Investment in climate-resilient infrastructure and a transition to a low-carbon future is critical to drive change while presenting attractive investment fundamentals.

The waste, recycling, and circular economy industry presents a specific and unique opportunity to investors as the world transitions to a low-carbon economy. Apart from increasing economic and environmental resiliency, the sector provides social benefits through near-term job creation as well.

<sup>1</sup> United Nations, [Climate Change](#)

<sup>2</sup> Bogner, J., M. Abdelrafie Ahmed, C. Diaz, A. Faaij, Q. Gao, S. Hashimoto, K. Mareckova, R. Pipatti, T. Zhang, [Waste Management. In Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change](#) [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

<sup>3</sup> WWF, [Plastic waste and climate change – what's the connection?](#)

## Plastic waste contributes to climate change

According to the Intergovernmental Panel on Climate Change, about 18% of methane emissions globally are generated from waste materials ending up in landfills.<sup>2</sup> Researchers estimated that the production and incineration of plastic around the world pumped more than 850 million tonnes of GHG into the atmosphere in 2019, the equivalent of 220 coal fired power plants, and these emissions are expected to rise to 2.8 billion tonnes by 2050.<sup>3</sup>

## Quantifying the relationship between waste management and GHG

Circulate Capital invests in solutions that reduce the impact of plastic waste on the environment and we have developed a first-of-its-kind prototype tool in collaboration with A\*STAR, Singapore's Agency for Science, Technology and Research, to quantify the environmental benefit of an investment through;

- I. the prevention of plastic and other waste from leaking into the environment, and
- II. the reduction/prevention of GHG emissions.

The system boundary includes plastic waste collection and end-of-life treatment based on a consequential LCA model that takes into account the avoided environmental burdens. Focusing on India and Indonesia, we have arrived at four vital observations that underscore how investing in proper plastic waste management and recycling can result in significant carbon savings.





## OBSERVATION 1

We would eliminate almost 150 million tonnes of GHG from the environment if we prevented 100% of the plastic leakage in India and Indonesia by 2030.

This is the same amount of GHG savings derived from shutting down 40 coal-fired power plants.

**Table 1:** Elimination of greenhouse gases resulting from the prevention of 100% of plastic leakage in India and Indonesia

	GHG ELIMINATED PER ANNUM (tCO <sub>2</sub> e)	GHG ELIMINATED BY 2030 (tCO <sub>2</sub> e)
INDIA	5.1 million	51 million
INDONESIA	9.7 million	97 million
TOTAL	14.8 million	148 million

*\*Based on conservative base case; increased year-on-year leakage not added*

The amount of GHG prevented will contribute substantially to the fight against climate change. To provide a meaningful frame of reference, we've compared the individual countries' emissions savings against their Paris Agreement/National Determined Commitment (NDC) reduction targets declared to the UNFCCC.

**Table 2:** Implication of preventing 100% of plastic leakage to countries' NDC 2030 reduction targets (assumes 100% of plastic leakage is prevented till 2030, with minimum country commitment)

	% OF NDC 2030 EMISSIONS REDUCTION TARGET - TOTAL COMMITMENT	% OF NDC 2030 EMISSION REDUCTION TARGET - WASTE SECTOR COMMITMENT
INDONESIA	11%	800%
INDIA	1.3%	28%



## OBSERVATION 2

**Open burning, incineration, or burning of plastic waste in cement kilns results in the largest carbon footprint** out of all end-of-life fates for plastic waste.

In Indonesia, approximately 36% of plastic waste is managed through open burning, but it contributes 91% to the total carbon footprint of all plastic waste in Indonesia. In India, 8% of all plastic waste is estimated to be managed through open burning, incineration or burning in cement kilns. However, it contributes 38% to the total carbon footprint of plastic waste. Investments in businesses and infrastructure that divert plastic from open burning into proper collection and recycling is the key driver of positive impact on greenhouse gas emissions.

## OBSERVATION 3

**Recycling infrastructure can offset the carbon footprint of plastics.**

In India, existing collection and recycling infrastructure is already a net negative carbon impact – meaning that it prevents more GHG than is created by plastic waste. Given this strong foundation, further investments to scale-up the system could make a significant and additive climate impact. In Indonesia, as the recycling ecosystem is not as active, a substantial increase in recycling capacity is required for carbon benefit to be achieved.

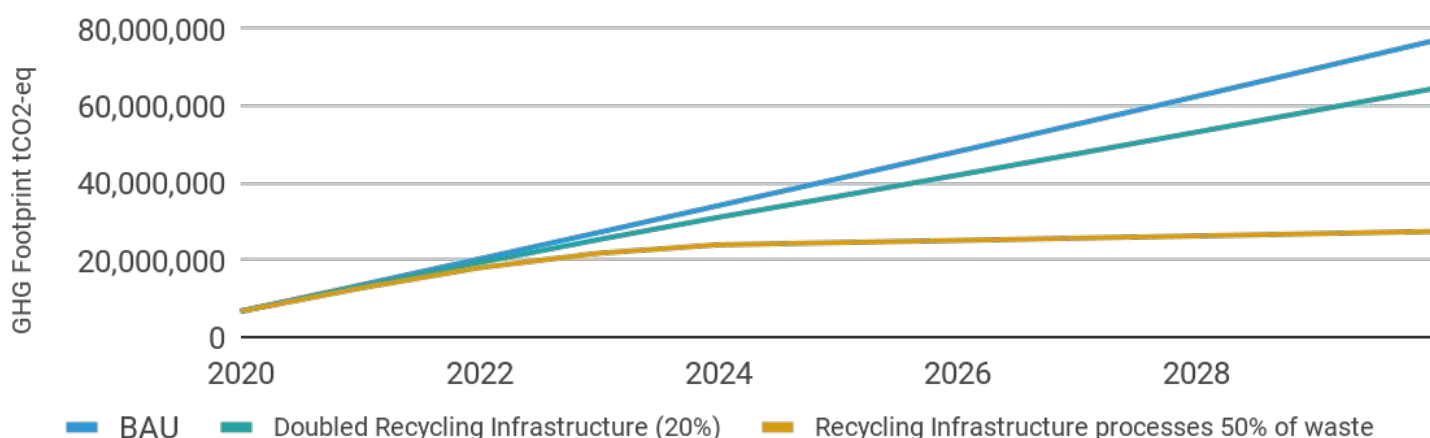
## OBSERVATION 4

**Existing recycling infrastructure can offset negative impacts on energy and water consumption, creating an even greater climate impact.** Environmental benefits are already being realised. In Indonesia, expanding recycling infrastructure from 20% to 50% quadruples energy savings (from c. 200,000 GJ to c. 800,000 GJ) and results in water savings growing from c. 50,000m<sup>3</sup> at 20% recycling to c. 250,000m<sup>3</sup> at 50%.

While India’s position is different due to current plans to progress to 24% waste-to-energy (WTE), which will result in greater GHG emissions, the model indicates that more efficient and comprehensive recycling infrastructure that results in the upcycling of plastic waste can create energy and water savings, beyond GHG.

*Note: In Indonesia, if recycling capacity is increased to 50%, the cumulative GHG benefit meets the overall GHG reduction target by 2023. Hence the curve plateaus.*

**Figure 1: Comparison of Indonesia GHG footprint at 10%, 20% and 50% recycling rates**





## CONCLUSION

**Investing in the waste, recycling, and the circular economy industry will transform it into a climate-resilient infrastructure asset class, contribute to change the trajectory of climate change and help meet climate-focused investing goals.**

For climate-focused investors, the waste, recycling, and circular economy industry presents a new frontier of opportunities to make an impact for the benefit of the environment, society and the economy.

## NEXT STEPS

**This research is just the beginning. If investors and national governments aim to include effective waste management and recycling solutions in their strategies to meet science-based climate targets, then additional data are needed.**

Building on the contributions of independent Life Cycle Assessment experts, academics, GHG regulators, climate investors and industry for this initial research, we are making the calculator available for others to use through The Circulate Initiative. TCI will launch an online calculator in 2021 and initiate an effort to expand its scope to account for more of the plastic waste we hope to see returning to supply chains and not entering the environment.

## FOR MORE INFORMATION

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