

## KEY POINTS

- Plastic significantly contributes to climate change. By 2050, emissions generated from the plastic life cycle could exceed 56 gigatons, or up to 10%–13% of the remaining carbon limit set by the Paris Agreement. The growing rate of plastic production poses a major challenge to mitigating climate change.
- In the anticipated Global Plastics Treaty (GPT), circular economy is key to fighting climate change. Key steps include extended producer responsibility (EPR), less plastic production, tackling problematic plastics, low-carbon energy sources, and better waste management.
- The Asian Development Bank (ADB) can scale up support to reduce plastic pollution through policy reforms that enable circular economy. ADB can further support countries to develop EPR frameworks and plastic credit schemes, and implement advance waste management technologies.
- ADB can support the Global Plastics Treaty implementation through financing, including sovereign and private sector lending with added co-benefits for climate action.

## Addressing Plastic Pollution for Climate Benefits: Opportunities in the Global Plastics Treaty for Asia and the Pacific

**Roger Joseph (Rocky) Guzman**  
International Governance, Policy,  
and Legal Consultant  
Technical Assistance on Promoting  
Action on Plastic Pollution from  
Source to Sea in Asia and the Pacific  
Asian Development Bank

**James Baker**  
Senior Circular Economy Specialist  
(Plastic Wastes)  
Climate Change, Resilience, and  
Environment Cluster  
Climate Change and Sustainable  
Development Department  
Asian Development Bank

### BACKGROUND AND INTRODUCTION

#### The Global Plastic Pollution Crisis

The excessive production and consumption of plastic, especially avoidable and single-use packaging, has led to major mismanagement of its disposal. This has caused large-scale pollution that negatively impacts the environment, human health, coastal communities, and food chains. However, despite this, the production of plastic continues to grow. During 2000–2019, the annual global production of plastics has doubled from 234 million metric tons to 460 million metric tons, mostly consisting of short-lived products.<sup>1</sup> Under current trends, it is projected that the global production and consumption of plastic will triple by 2060 (footnote 1).

#### Plastic Pollution and Climate Change Linkages

Plastic contributes substantially to climate change throughout its life cycle. In 2019, plastics generated 1.8 billion metric tons, or 3.8% of the world's total greenhouse gas (GHG) emissions.<sup>2</sup> As much as 90% of those emissions come from plastic production and conversion from fossil fuels (footnote 2). According to a 2017 study, 99% of plastics

<sup>1</sup> Organisation for Economic Co-operation and Development (OECD). 2022. *Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options*. Paris: OECD Publishing.

<sup>2</sup> H. S. Charlton-Howard et al. 2023. 'Plasticosis': Characterizing Macro- and Microplastic-associated Fibrosis in Seabird Tissues. *Journal of Hazardous Materials*. 450. pp. 131090.

are made from chemicals obtained from fossil fuels, and the two sectors are closely linked through production processes and investments.<sup>3</sup>

Disposal of plastic waste, especially incineration, also contributes to GHG emissions. Carbon emissions from plastic incineration is estimated to have reached 850 million tons in 2019 alone.<sup>4</sup> Climate change influences the distribution of plastic pollution through the increased occurrence of extreme weather events and flooding. Plastic pollution also weakens the resilience of ecosystems to adapt to climate change and exacerbates flooding by blocking waterways.

By 2050, the combined GHG emissions from plastic production and incineration are projected to surpass 56 gigatons, representing approximately 10%–13% of the remaining carbon budget or the amount of GHGs that can be emitted to remain within the Paris Agreement targets (footnote 4). In a business-as-usual scenario, plastics could contribute up to 19% of the global GHG emissions allowed to stay within 1.5°C by 2040 (footnote 4).

Among the major materials industries, such as cement and aluminum, plastics are still projected to experience the highest net growth in GHG emissions, making it the sector with the most substantial projected increase in emissions under current rates.<sup>5</sup> The expansion of plastic production and the accompanying GHG emissions present a big challenge to mitigating climate change.

## THE PLASTICS–CLIMATE CHANGE NEXUS

### Carbon Footprint Throughout the Plastic Life Cycle

Every stage of the plastic life cycle, from extraction and processing of raw materials to the design, manufacturing, packaging, distribution, utilization, maintenance, and end-of-life management contributes to the generation of GHG emissions. The entire life cycle must be assessed when evaluating the impact of plastics on climate change. This can be divided into the following three main stages:

**Extraction and production.** Significant GHG emissions are generated from methane leakage and emissions from fuel combustion, as well as the energy consumed during the drilling process for oil or gas (footnote 4). Emissions are also produced when forests and fields are cleared to create space for well pads and pipelines (footnote 4). Plastic refining is recognized as one of the most emissions-heavy sectors, which involves various chemical processes such as cracking and polymerization to form plastic resins (footnote 4).

**In 2015, the primary production of plastics alone resulted in the emission of more than 1 billion metric tons of carbon dioxide, equivalent to over 3% of global fossil fuel emissions.**

Plastic production processes are also highly energy-intensive, with roughly half of its raw materials coming from carbon products, while the remaining half becomes embedded within the plastic materials (footnote 5). In 2015, the primary production of plastics alone resulted in the emission of more than 1 billion metric tons of carbon dioxide (CO<sub>2</sub>), equivalent to over 3% of global fossil fuel emissions. In comparison, the entire agriculture sector contributes approximately 10%–15% of GHG emissions (footnote 3).

**Disposal and waste management.** Incineration and open burning are the main sources of GHG emissions in plastic waste management, as these activities release carbon directly into the atmosphere. Plastics also contain harmful additives that can be released into the environment during the combustion process. In 2015, the net GHG emissions from incinerating plastics packaging reached 16 million metric tons (footnote 3). Out of the total plastic packaging waste globally, 50% is disposed of in sanitary landfills, 19% is sent to incineration facilities, and a mere 9% is recycled, although for developing countries these figures are considerably much lower (footnote 1). The remaining 22% follow alternative routes, including open dumping and burning (footnote 1).

**Plastic pollution in the marine environment and impacts on ocean climate regulation.** When plastic is not properly managed, it remains in the environment and continues to have climate impacts as it degrades. In particular, plastic pollution has adverse impacts on the world's oceans, which have historically absorbed a substantial portion of carbon emissions through the capture of carbon by phytoplankton and zooplankton.

At least 14 million tons of plastic pollution enter the ocean every year, making up 80% of marine debris.<sup>6</sup> When plastic waste breaks down, it fragments into smaller pieces called microplastics. In the marine environment, microplastics limit the ocean's ability to effectively absorb and retain carbon.<sup>7</sup> Although evidence is still emerging, studies show that carbon-feeding marine organisms are increasingly being contaminated by microplastics (footnote 3).

<sup>3</sup> Center for International Environmental Law (CIEL). 2017. *Fueling Plastics: Fossils, Plastics, & Petrochemical Feedstocks*. Washington, DC.

<sup>4</sup> CIEL. 2019. *Plastic & Climate: The Hidden Costs of a Plastic Planet*. Washington, DC.

<sup>5</sup> Material Economics. 2018. *The Circular Economy—A Powerful Force for Climate Mitigation*. Stockholm: Material Economics.

<sup>6</sup> International Union for Conservation of Nature (IUCN). 2021. *Marine Plastic Pollution*. *IUCN Issues Brief*. November. Gland.

<sup>7</sup> M. Cole et al. 2016. *Microplastics Alter the Properties and Sinking Rates of Zooplankton Faecal Pellets*. *Environmental Science and Technology*. 50 (6). pp. 3239–3246.

Mismanaged plastic pollution may indirectly contribute to climate change by disrupting the carbon sequestration of foundational species in ocean food chains.

### OPPORTUNITIES FOR CLIMATE CHANGE MITIGATION IN THE GLOBAL PLASTICS TREATY

#### Global Plastics Treaty—Background

To reach the Paris Agreement goals, a comprehensive approach is required to manage the entire plastic life cycle. Minimizing the climate impact of plastics also requires a coordinated approach to align with countries' nationally determined contributions (NDCs) as part of the United Nations Framework Convention on Climate Change.

However, achieving a sustainable plastics economy aligned with global climate goals has been challenging. Barriers have included knowledge gaps around plastic waste solutions, technical challenges in recycling all types of plastics to high-quality grades, and underdeveloped value chains.<sup>8</sup> Lack of investable ventures, markets, and financing opportunities as well as industry awareness and participation also pose challenges in ensuring circularity and systems change.<sup>9</sup>

In response, in March 2022, the United Nations Environment Assembly (UNEA) adopted a resolution with the objective of ending plastic pollution.<sup>10</sup> This resolution outlined a target to draft an internationally legally binding agreement (or the “Global Plastics Treaty” or GPT) on plastics by 2024, to be opened for adoption by countries by 2025. The GPT's main aim is to create a comprehensive framework that addresses all aspects of the plastic life cycle from extraction to disposal.

The GPT elements include core obligations, control measures, and voluntary approaches to address plastic pollution, the establishment of implementation measures, and the means of implementation. At the center of the global agreement is the development of national-level plans for reducing plastic pollution. These plans will translate international commitments into concrete policies and actions aimed at mitigating the plastics crisis.

Opportunities to achieve co-benefits for climate change mitigation may include the following:

**Mainstreaming circular economy through extended producer responsibility for waste prevention.** To effectively tackle climate change and plastic pollution, economies must transition toward a circular approach that decouples economic growth from the consumption of finite resources.<sup>11</sup> Circular economy uses business models that prolong the lifespan of products and materials. This minimizes material production, reduces the consumption of raw materials, and lowers GHG emissions. The GPT is envisioned to foster circular practices to address plastic pollution and climate change.

By implementing business models that enhance resource utilization and extend the lifespan of material-intensive assets, it is possible to reduce emissions by approximately 62 million metric tons of CO<sub>2</sub> annually (footnote 5). This requires the adoption of energy-efficient technologies in manufacturing, improvements in raw material design and management, and increased use and reuse by producers. Substantial progress can be made in plastic waste management through reducing waste in production and prolonging product life cycles.

To achieve these goals, the GPT offers an opportunity to mainstream extended producer responsibility (EPR) schemes that cover the entire life cycle of products and packaging. EPR holds producers responsible for the environmental impacts of their goods through legal and financial obligations.<sup>12</sup> EPR systems provide a framework for producers to take accountability for their products and support environmentally friendly practices (footnote 12). This approach plays a vital role in funding the collection and proper management of waste while encouraging the development of products that prioritize efficient resource utilization at every stage, including repair, reuse, and recycling.

**Promoting reduction at source and addressing nonessential and problematic plastics.** The production, usage, and disposal of plastic packaging are escalating at a rapid pace, surpassing the capacity of current waste management practices (footnote 3). This is due to the sheer quantity of plastic being produced, the complex composition of multilayered packaging, and the challenges posed by contamination.<sup>13</sup> The GPT could address this through the establishment of core obligations to reduce plastic production.

<sup>8</sup> J. P. Lange. 2021. *Managing Plastic Waste—Sorting, Recycling, Disposal, and Product Redesign*. *ACS Sustainable Chemistry and Engineering*. 9 (47). pp. 15722–15738.

<sup>9</sup> The Circulate Initiative. 2023. *The Plastics Circularity Investment Tracker: Monitoring Capital Flows to Tackle the Plastic Pollution Challenge*. March. Singapore.

<sup>10</sup> UNEA Resolution 5/14 entitled “End Plastic Pollution: Towards an International Legally Binding Instrument.”

<sup>11</sup> C. Scheel et al. 2020. *Decoupling Economic Development from the Consumption of Finite Resources Using Circular Economy*. A Model for Developing Countries. *Sustainability*. 12 (4). 1291.

<sup>12</sup> PETCO et al. 2022. *Integrating Extended Producer Responsibility Into the Negotiations for an International Plastics Treaty*. Position Paper.

<sup>13</sup> Eureka Recycling. 2009. *Recycling Plastic: Complications & Limitations*. April. Minneapolis, United States (US).

The best way to avoid this is through waste prevention and minimizing production.<sup>14</sup> Source reduction, or reducing the generation of waste in the first place, significantly decreases emissions associated with raw material acquisition and manufacturing processes.<sup>15</sup> By prioritizing the production and consumption of fewer plastics, it is possible to remove waste management emissions altogether.

Limiting the production of specific plastic types that are avoidable, nonessential, and/or problematic would substantially reduce energy emissions generated during manufacturing. Within the framework of the GPT, this could involve implementing prohibitions on single-use and disposable plastic items, eco-design for recyclability, and promotion of reuse systems, ensuring that all materials are treated as valuable resources and reintegrated into the economy and eliminating the need for incineration or landfilling.

#### **Promoting low-carbon energy use in plastic life cycle processes.**

Using low-carbon energy sources throughout the entire plastic life cycle is necessary to mitigate climate change impacts. This is relevant for essential products, such as pharmaceutical and medical items that cannot be extensively reduced or eliminated. Scenario studies show that complementing plastics and climate mitigation policies across the plastic life cycle could lead to a two-thirds decrease in emissions. This could be attributed to a reduction in plastic use, shifts to less carbon-intensive energy sources for production and conversion, and lowering of indirect emissions from electricity generation (footnote 1).

Approaches to low-carbon usage in the plastics industry involve using renewable energy sources, enhancing energy efficiency during production processes, and exploring carbon capture technologies. The GPT framework could support research and development efforts to advance sustainable production methods and implement benchmarking systems to assess energy efficiency and CO<sub>2</sub> emissions. Regulatory measures, such as policies for air quality standards and emission targets and structuring subsidies to incentivize energy-efficient alternatives in plastics production, can also be considered.

#### **Enhancing downstream waste management and recyclability.**

The GPT could include measures that prohibit the incineration and open burning of plastic waste, reducing GHG emissions. However, this would mean more than just discontinuing incineration and unsustainable waste management practices. Optimizing the reuse and recyclability of all waste streams through efficient source separation of waste would also be necessary.

**Ensuring national compliance toward ending plastic pollution and climate change mitigation.** The Paris Agreement requires state parties to create and uphold their NDCs and their individual

country strategies to tackle climate change. These plans are crucial in mitigating domestic carbon emissions and implementing climate change adaptation measures. The upcoming GPT can incorporate similar action planning requirements tailored to each country, outlining policies and actions aimed at addressing plastic pollution. National action plans will support turning country obligations into concrete policies and regulations suited to the specific circumstances and needs on the ground.

To effectively address the climate impacts across different stages throughout the entire life cycle of plastic, these action plans can be used to enforce targets for reducing GHG emissions as part of plastic pollution reduction strategies. The national action plan framework for the GPT should also take lessons from the lack of robust enforcement mechanisms under the Paris Agreement and ensure the establishment of measures that facilitate compliance with country commitments and obligations.

## **POTENTIAL INTERVENTIONS UNDER THE GLOBAL PLASTICS TREATY AS A CLIMATE CHANGE MITIGATION STRATEGY**

The recommendations under this brief cover potential components of the GPT that could yield co-benefits for climate change mitigation.

### **Possible Core Obligations, Control Measures, and Voluntary Approaches**

To effectively combat plastic pollution, a diverse set of control measures must be in place to address the elimination, reduction, safe circulation, and safe management of plastic waste.

**Upstream life cycle approach.** There are proposals to identify plastic products that are unnecessary and contribute to pollution, including single-use plastics. By reducing or eliminating the use of such problematic and avoidable products, the economic viability of recycling can improve, encouraging the growth of a strong recycling market. Aside from addressing specific plastic types, it is also important to address the leakage of microplastics throughout the entire life cycle. The possible control measures are discussed in Table 1.

**Midstream life cycle approach.** By designing products and packaging for reuse and recyclability, more plastic can be recycled. Promoting reduction, reuse, and repair during the product design phase also contributes to overall resource efficiency. Effectively implemented EPR schemes, which hold producers responsible for the environmental consequences of their products from production to disposal, will be an important part of this approach. This promotes the growth of the recycling market, incentivizes

<sup>14</sup> CIEL. 2017. *Fueling Plastics: Fossils, Plastics & Petrochemical Feedstocks*. Washington, DC; Government of the United States, Environmental Protection Agency (EPA). 2006. *Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks*.

<sup>15</sup> Government of the US, EPA. 2015. *Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model*. March. Washington, DC.

Table 1: Possible Control Measures in the Upstream Life Cycle of Plastics

Possible Control Measure	Potential Content
Reducing primary plastic polymers	<ul style="list-style-type: none"> <li>Establish global targets to reduce the production of primary plastic raw materials.</li> <li>Implement a moratorium on primary production of plastic polymers or ban, limit, or reduce the manufacture, export, and import of virgin plastic polymers.</li> <li>Establish tracking and monitoring requirements.</li> <li>Where necessary, establish low-carbon targets and goals for manufacture of plastics and packaging.</li> </ul>
Reducing problematic and avoidable plastic products	<ul style="list-style-type: none"> <li>Establish criteria to determine problematic, unnecessary, and/or avoidable plastic products.</li> <li>Ban, phase out, reduce, or control the production, sale, distribution, trade, and use of specific problematic and avoidable plastic products.</li> <li>Classify specific products for control measures: (i) groups with high feasibility of elimination, or at least significant reduction in use; and (ii) groups that cannot be targeted for significant reduction or elimination for maximum circulation.</li> </ul>
Reducing microplastics	<ul style="list-style-type: none"> <li>Ban, phase out, reduce, or control the use of microplastics.</li> <li>Ban, phase out, reduce, or control the production, sale, distribution, trade, and use of microplastics and products containing them.</li> <li>Develop guidelines on the best available technology and best environmental practices.</li> </ul>

Source: United Nations Environment Programme. 2023. Potential Options for Elements Towards an International Legally Binding Instrument, based on a Comprehensive Approach that Addresses the Full Life Cycle of Plastics as Called for by United Nations Environment Assembly Resolution 5/14. 29 May–2 June. Paris.

Table 2: Possible Control Measures in the Midstream Life Cycle of Plastics

Possible Control Measure	Potential Content
Establishing EPR systems	<ul style="list-style-type: none"> <li>Establish guidelines for EPR systems.</li> <li>Provide financial support, e.g., tax exemptions for recycling projects.</li> <li>Establish platforms for knowledge sharing and international cooperation.</li> <li>Establish the best available technologies to ensure alignment with the Paris Agreement.</li> </ul>
Promoting design for circularity	<ul style="list-style-type: none"> <li>Establish design and circularity criteria for products and packaging manufacturing to encourage and enable recovery and reuse.</li> <li>Establish national requirements for the design criteria to promote circularity.</li> </ul>

EPR = extended producer responsibility.

Source: United Nations Environment Programme. 2023. Potential Options for Elements Towards an International Legally Binding Instrument, based on a Comprehensive Approach that Addresses the Full Life Cycle of Plastics as Called for by United Nations Environment Assembly Resolution 5/14. 29 May–2 June. Paris.

producers to design circular products, and reduces the leakage of plastic waste into the environment. The possible control measures are discussed in Table 2.

**Downstream life cycle approach.** To comprehensively address plastic pollution, it is essential to prevent the leakage of plastics into the natural environment. Rivers play a significant role in transporting large volumes of plastic waste into the oceans. Plastic incineration and open burning release toxic chemicals and particles such as dioxins and furans and contribute to pollution, while posing substantial risks, especially to informal waste workers who come in direct contact with such waste. The possible control measures are discussed in Table 3.

### Means of Implementation

Means of implementation refers to the essential resources, policies, and actions needed for all parties to fulfill their obligations under

## Promoting reduction, reuse, and repair during the product design phase also contributes to overall resource efficiency.

the GPT. This primarily involves financial assistance, technology transfer, and capacity building for developing countries to meet their commitments under the GPT.

Financial assistance is necessary to meet commitments associated with infrastructure, technology adoption, and monitoring systems. This support helps parties fulfill their obligations and promotes fairness by enhancing implementation capacities particularly for countries with limited resources. Financial assistance also

Table 3: Possible Control Measures in the Downstream Life Cycle of Plastics

Possible Control Measure	Potential Content
Promoting reduce, reuse, and repair	<ul style="list-style-type: none"> <li>Establish product design standards and requirements, including for specific plastic products and packaging.</li> <li>Foster reduction and reuse of plastic products through EPR and deposit-refund and take-back schemes, fees, tariffs, tax incentives, and trade barrier removal.</li> </ul>
Strengthening waste management	<ul style="list-style-type: none"> <li>Regulate the end-of-life management of plastic waste to reduce leakage from mismanaged waste.</li> <li>Prohibit incineration, open burning, co-firing in coal-fired power plants and other waste-to-energy processes, cement kilns, and other similar processes.</li> </ul>
Eliminating release to the environment	<ul style="list-style-type: none"> <li>Prohibit or reduce the release of plastics to the environment.</li> <li>Remove existing plastics in the environment.</li> <li>Establish sector-specific measures e.g., gear design for abandoned, lost, or discarded fishing gear.</li> <li>Develop the best available technology and environmental practices, including environmental and emission standards, to minimize and eliminate pollution.</li> </ul>

EPR = extended producer responsibility.

Source: United Nations Environment Programme. 2023. Potential Options for Elements Towards an International Legally Binding Instrument, based on a Comprehensive Approach that Addresses the Full Life Cycle of Plastics as Called for by United Nations Environment Assembly Resolution 5/14. 29 May–2 June. Paris.

facilitates the exploration of novel technologies and innovative solutions through research and development.

The financial aspects of the GPT have not yet been determined, but it is anticipated that countries, particularly developing countries, will require substantial support for capacity building, technical assistance, and implementation. A financial mechanism will also need to be developed to implement the GPT provisions.

Initiatives related to a circular plastic economy should align with climate goals and commitments. It is thus important to link the GPT provisions with the commitments already made under the Paris Agreement, especially toward more investments that deliver co-benefits.

### Implementation Measures

The GPT implementation measures may include national action plans (NAPs), national reporting requirements, provisions for ensuring compliance, regular assessments, and reporting. NAPs could serve as the catalyst for establishing appropriate policy, legislative, and institutional frameworks to effectively implement the GPT's provisions.

However, to maximize the effectiveness of NAPs, key enabling conditions should be met, such as NAPs being legally binding and having stringent compliance measures with robust monitoring.

**The financial aspects of the GPT have not yet been determined, but it is anticipated that countries, particularly developing countries, will require substantial support for capacity building, technical assistance, and implementation.**

These should also be regularly revised to incorporate new knowledge and supported by technical and financial assistance to ensure efficacy on the ground.<sup>16</sup> The NAPs can also align national goals and targets for plastic reduction and pollution interventions with the goals and targets set under the Paris Agreement for climate mitigation.

Incorporating national reporting requirements allows parties to share their knowledge, experiences, and challenges. It serves as a valuable tool for identifying areas that require support and prioritization. National reporting also facilitates the exchange of best practices and innovative approaches among parties, promoting collaboration.

<sup>16</sup> A. March et al. 2023. *Effectiveness of National Action Plans*. *Global Plastics Treaty Policy Brief*. Global Plastics Policy Centre and Dalhousie University.

## ADB: FINANCING AND INVESTMENT FOR CLIMATE CHANGE MITIGATION AND PLASTIC POLLUTION REDUCTION

The Asian Development Bank (ADB) has aligned its investment strategy to tackle climate change and enhance environmental sustainability, including plastic pollution. ADB's Strategy 2030 aims to achieve a prosperous, inclusive, resilient, and sustainable Asia and the Pacific while promoting the concept of circular economy.<sup>17</sup> It also supports ADB developing member countries (DMCs) in their commitments toward Net Zero 2050 and has set a goal of providing \$100 billion in climate financing from 2019 to 2030, raising the target from \$80 billion, and with the ambition of raising \$66 billion for climate mitigation efforts.<sup>18</sup> The boost in funding is envisaged to open opportunities for climate mitigation projects and drive policy reforms toward climate action and resilience (footnote 18). In addition, ADB introduced a new operating model in 2023 that prioritizes innovative solutions, private sector growth, greater commitment to climate change, and a more responsive, client-centric approach.<sup>19</sup>

ADB is helping its DMCs reduce plastic pollution by supporting the development of action plans and reforming policies to promote a circular economy for plastics. This is currently supported by a regional technical assistance project: Promoting Action on Plastic Pollution from Source to Sea in Asia and the Pacific.<sup>20</sup> Through the project, ADB is supporting plastic pollution reduction investments and integrated solid waste management systems that align with circular economy principles covering Indonesia, the Philippines, Sri Lanka, Thailand, and Viet Nam.

Circular economy is a programmatic system approach that aims to support economic development while breaking away from unsustainable consumption practices. It focuses on various sectors such as energy, transport, water, urban development, digital technology, agriculture and food security, climate change, environment, and gender and social development. The implementation of circular economy involves adopting a country-specific approach, promoting digital development and innovative technologies, and expanding private sector operations (footnote 17). These efforts align with other ADB initiatives, including the Action Plan for Healthy Oceans and Sustainable Blue Economies and the Livable Cities program, that ensure a holistic and integrated approach toward sustainable development.

ADB can provide financial and technical assistance to support DMCs' readiness for the GPT rollout. This brief considers opportunities in Southeast Asia that could be scaled across Asia and the Pacific.

## How Can ADB Support Its DMCs to Reduce Plastic Pollution?

### Development of Extended Producer Responsibility Frameworks

- (i) **Extended producer responsibility as a regulatory and financing mechanism.** EPR acts as a regulatory framework that sets mandatory collection targets and serves as a financing mechanism for waste collection, sorting, and recycling. This policy approach incentivizes producers to minimize waste generation and improve the design of their products and packaging by holding them accountable for their products until the post-consumer stage of its life cycle (footnote 12). It puts the cost of waste management and pollution on the producers, reducing government spending on waste management infrastructure or the need to collect household waste fees. This mobilizes finance for waste management and makes recyclability more cost efficient through better design and efficient packaging (footnote 12).
- (ii) **Policy support for extended producer responsibility.** ADB can support policy reform and capacity development in the implementation and development of EPR frameworks. Viet Nam was the first country in Southeast Asia to enact an EPR legislation when the 2020 Environmental Protection Law took effect in January 2022. The law imposed specific responsibilities on producers and importers regarding the recycling and treatment of discarded products and packaging associated with their goods. A decree was enacted to support the implementation of EPR, including labeling and registration of products and recycling requirements, either through self-implementation, an intermediary or through contribution to the Viet Nam Environmental Protection Fund. The EPR law in the Philippines was also enacted in 2022, with the goal of requiring manufacturers to take responsibility for 80% of their plastic packaging waste footprint by 2028.<sup>21</sup> Large enterprises are required to participate in EPR, while participation is encouraged for micro, small, and medium-sized enterprises.
- (iii) **Enabling conditions for circular economy.** ADB can help support enabling conditions for a plastics circular economy through policy reform, development of waste management infrastructure, and capacity building. The Government of Thailand recently adopted the Road Map on Plastic Waste Management Phase 2, which includes plans to enact an EPR law on packaging by 2027.<sup>22</sup> In Indonesia, there are existing producer responsibility schemes for the manufacturing, retail, and food and beverage sectors as outlined in the 2019 Roadmap on Reducing Plastic Pollution by Producers.

<sup>17</sup> ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. July. Manila.

<sup>18</sup> ADB. 2021. *ADB Raises 2019–2030 Climate Finance Ambition to \$100 Billion*. News release. 13 October.

<sup>19</sup> ADB. 2022. *Organizational Review: A New Operating Model to Accelerate ADB's Transformation Toward Strategy 2030 and Beyond*. October. Manila.

<sup>20</sup> ADB. *Regional: Promoting Action on Plastic Pollution from Source to Sea in Asia and the Pacific*.

<sup>21</sup> N. Medved-Po and S. DiGrande. 2023. *Position Paper: How Plastic Credits are Supporting the Global Plastics Treaty*. Plastic Credit Exchange.

<sup>22</sup> A. S. Suwarno. 2023. *Unlocking the Solution to Plastic Pollution: Thailand's Push for Circular Economy and Extended Producer Responsibility*. *Regional Knowledge Centre for Marine Plastic Debris*. 27 April.

## Plastic credits are an innovative finance mechanism enabling companies to invest in the development or expansion of plastic waste management infrastructure.

However, these have not been institutionalized through legal frameworks and there is potential for policy reform support to strengthen the system.<sup>23</sup> These provide an opportunity for ADB to assist DMCs in aligning policy and investment with country goals and obligations.

- (iv) **Knowledge exchange for extended producer responsibility.** ADB can scale up its knowledge-sharing platforms and exchange best practices to adopt EPR schemes to support the implementation of the GPT. This could include customizing EPR to address specific country challenges and unique market realities. ADB is already involved in regional knowledge activities related

to EPR through knowledge products, training, and regional workshops. ADB's technical assistance project on Promoting Action on Plastic Pollution from Source to Sea in Asia and the Pacific also includes various thematic areas, such as regional cooperation, circular economy, and support for EPR through community and business behavior change programs, capacity-building initiatives, and policy and regulatory measures.

### Scaling up of Plastic Credit Schemes

- (i) **An innovative finance mechanism.** Plastic credits are an innovative finance mechanism enabling companies to invest in the development or expansion of plastic waste management infrastructure. This ensures that any remaining plastic waste in a company's value chain will be properly collected and recycled.<sup>24</sup> Broadly, plastic credits are transferable units that represent plastic collected and recycled from the environment.<sup>25</sup> Typically, one plastic credit equals the collection or recycling of one metric ton of plastic waste. These credits are given as recognition for surpassing the standard rates of plastic collection and recycling that would have occurred without them.

### Box: Lessons from Carbon Finance

**Stimulating private sector funding.** The carbon credit market establishes a platform for trading carbon credits and assigning a monetary value to carbon emissions. Carbon credits are traded from sustainable projects that reduce emissions such as energy conservation investments. Insights and models from carbon finance, such as the Clean Development Mechanism (CDM) carbon credits introduced by the Kyoto Protocol, have led to significant investments in reducing methane and greenhouse gases. Initially, the CDM scheme achieved success with the registration of nearly 6,600 projects and the issuance of approximately 1.2 billion tons of carbon dioxide.<sup>a</sup> Although the Kyoto Protocol implementation eventually collapsed after 15 years, the voluntary crediting approach is known to have stimulated substantial private sector funding at the time.<sup>b</sup>

**Carbon credit market challenges.** The effectiveness of the Kyoto market mechanisms was significantly affected by a lack of political commitment and the withdrawal of interest from target countries, which resulted in insufficient demand. This lack of demand led to unreliable prices for CDM credits, undermining their credibility as reliable sources of future revenue. The complexities of these mechanisms, along with challenges in implementing consistent standards and unrealistic information requirements, posed significant difficulties for project developers and regulators (footnote b).

**Systemic change is necessary.** Policymakers can learn valuable lessons from the partially successful international carbon market established by the CDM. These lessons highlight the effectiveness of credit systems in involving businesses, creating awareness, and motivating local action to make a positive impact. However, it is essential to recognize that credit systems alone are not enough to bring about profound and transformative change. In the context of mobilizing finance for the GPT, achieving systemic change requires supportive policies and strong political commitment, such as through comprehensive extended producer responsibility (EPR) systems and other control measures.<sup>c</sup>

<sup>a</sup> K. Kainou. 2022. Collapse of the Clean Development Mechanism Scheme under the Kyoto Protocol and Its Spillover: Consequences of "Carbon Panic." *Centre for Economic Policy Research Vox EU*. 16 March.

<sup>b</sup> World Bank. 2018. *Carbon Markets Under the Kyoto Protocol: Lessons Learned for Building an International Carbon Market Under the Paris Agreement*. Washington, DC.

<sup>c</sup> Ellen Macarthur Foundation. 2016. *The New Plastics Economy: Rethinking the Future of Plastics*. Isle of Wight.

<sup>23</sup> EPR Indonesia. *The Legal Framework in Indonesia*. EPR in Indonesian Law.

<sup>24</sup> Verra. 2023. *Five Things You Should Know about Plastic Credits*.

<sup>25</sup> E. Simon and E. Martin. 2021. *Putting the Credible in Plastic Crediting*. WWF. 28 January.



- (ii) **Standardizing methodologies.** ADB can support a plastic credit system that facilitates standardized tracking and accreditation of plastic collection and recycling efforts. These systems allow independent audits to measure the actual reduction of plastic waste. For example, Verra, a carbon credit registry which operates a number of environmental standards, has two types of systems for their plastic credits: Waste Collection Credits for projects that dispose of collected plastic waste in a way that prevents environmental leakage, and Waste Recycling Credits for projects that use recycled plastic as a substitute for virgin plastic (footnote 24). Through the purchase of credits, funds are generated to support collection and recycling projects.<sup>26</sup> Verra’s methodology has already been used in projects across the developing world where financing is most needed, and several projects in Asia have adopted its standards.
- (iii) **Scaling up early plastic credit models.** ADB can scale up early regional plastic credit schemes in line with the GPT goals. Plastic Credit Exchange (PCX) in the Philippines is a plastic offset platform that facilitates crediting post-consumer plastics using the Plastic Pollution Reduction Standard as a verifiable plastic credit and certification system. In Thailand, Second Life, a social enterprise focused on circular plastic waste supply chains, released Verra-certified plastic credits that work to enhance plastic waste collection and recycling in remote coastal and island communities.<sup>27</sup> Revenue from such plastic credits incentivizes waste collection, sorting collected fishing nets for recycling, and training.<sup>28</sup> In Indonesia, Reciki’s Plastic Waste Valorization Project collects, sorts, and mechanically recycles or reuses plastic waste in East Java and Bali.<sup>29</sup> Effectively implementing these early models of credit mechanisms could provide immediate financing support in line with the GPT.
- (iv) **Bridging finance gaps.** Plastic credits have the potential to enhance the effectiveness of EPR schemes. These credits aim to attract investments to establish and expand plastic waste collection and recycling activities. By recognizing plastic credits within national EPR schemes, progress toward regional goals for plastic waste collection and recycling can be accelerated. Companies obligated to comply with EPR requirements can use plastic credits to pay for EPR fees instead. The Philippines provides some insights on the role of credits within EPR frameworks, as crediting allows businesses to meet EPR program requirements. Through credit schemes such as PCX, enterprises are incentivized to develop more

## Efforts for the digitalization of waste management have been ongoing as part of ADB’s technical assistance on plastic pollution reduction.

recycling infrastructure (footnote 21). Plastic credits can thus help bridge the financial gap for governments in managing plastic waste until fully functional EPR schemes are developed, and credit systems can potentially provide an immediate market-based strategy to address solid waste mismanagement and promote circularity.<sup>30</sup>

- (v) **Providing opportunities for poverty alleviation.** Crediting mechanisms can also improve the livelihoods and working conditions of informal waste workers and women. Sales derived from informal waste sector activities create opportunities for poverty alleviation. Thus, the effectiveness of these credit systems is expected to be higher in regions where the informal sector is well-organized and supply chains are formalized.<sup>31</sup> Credit schemes can also be utilized to promote women empowerment and address gender disparities in the informal waste management system (footnote 21). In the Philippines, for example, PCX is supporting Friends of Hope, Inc. (FOH) operate a waste-to-cash initiative called “Aling Tindera” that empowers female microentrepreneurs with resources and training to collect and purchase plastic waste that they can sell to FOH (footnote 21). Overall, plastic credit systems can drive investments in infrastructure aimed at rectifying deficiencies in local waste management and recycling systems (footnote 31).

### Digital and High-Level Technology Solutions for Plastic Waste Management

- (i) **Digital solutions for circular economy.** ADB is committed to supporting digital and high-level technology solutions to enable a circular economy for plastics. These include high-level technology projects that prevent, reduce, collect, recycle, and clean up plastic waste, enhancing the value chain of plastic waste management. As winner of the ADB Innovation Hub’s Healthy Oceans Technology Innovation Challenge in 2022, ADB provided a grant to Alner (formerly Koinpack) for a technology-enabled deposit–return refilling system. Based in Indonesia, Alner allows customers

<sup>26</sup> T. Zinnes. 2021. *Your Roadmap to the Global Plastic Credit Market*. *Plastic Collective*. 19 March.

<sup>27</sup> Verra. 2022. *Verra Issues First Plastic Waste Reduction Credits*. 24 March.

<sup>28</sup> Verra. *Plastic Waste Reduction Standard*. Second Life Thailand.

<sup>29</sup> EPR Indonesia. 2023. *Business Opportunity within the Implementation of EPR Scheme in Indonesia*. 21 February.

<sup>30</sup> United Nations Environment Programme. 2023. *Assessing the Contribution of Plastic Credit Schemes to Reducing Plastics Pollution and Improving Recycling*. Working Paper–Executive Summary. Nairobi.

<sup>31</sup> Ellen Macarthur Foundation. 2016. *The New Plastics Economy: Rethinking the Future of Plastics*. Isle of Wight.

to buy their preferred brands in reusable bottles instead of single-use sachets.<sup>32</sup> The grant is intended to scale up their technology and boost capacity through the expansion of standard reusable package designs and software development.

- (ii) **Technology road maps to reduce plastic pollution.** ADB can support digital road maps to improve the digitalization of the plastic waste management system. Efforts for the digitalization of waste management have been ongoing as part of ADB's technical assistance on plastic pollution reduction. The initiative includes screening and testing digital solutions, establishing data governance protocols, and creating a Plastic Management Open Data Platform. Another solution being explored is an app-based blockchain system that captures and verifies recycled plastic volumes from the informal sector to the remanufacturer. This initiative is also connected to plastic credits and involves the use of community and MSME apps to support plastic credits and compliance activities in preparation for the implementation of control measures under the GPT.

## ADB's Financing Role

**Supporting a finance system for the Global Plastics Treaty implementation.** ADB can support the development of finance systems that will implement core elements of the GPT. The GPT presents opportunities to promote waste management approaches, including EPR, plastic credits, and digital solutions. These tools offer flexibility in meeting country obligations to address plastic pollution and can also be integrated as voluntary initiatives as a starting point. Recognizing the need to access further financing, these mechanisms are key to mobilizing funds in developing countries. Multilateral development banks will be instrumental in attracting investments to address plastic pollution that aligns with global, regional, and national goals.<sup>33</sup>

**Upholding safeguards.** ADB must ensure environmental and social safeguards are upheld as GPT obligations are implemented. This is particularly relevant to alleviating working conditions in

ADB operations can assist in the identification, preparation, and implementation of government and private sector actions and investments aimed at reducing marine plastic pollution under the GPT.

the informal sector, improving livelihoods, and reducing poverty. Robust EPR systems and plastic credits linked with digital solutions can create further opportunities to uplift the informal sector with appropriate social safeguards in place. This will support the GPT's vision of a just transition (footnote 33).

## Building the Next Generation of Investments through Sovereign and Private Sector Lending

### Supporting the development of governance frameworks.

Sovereign lending plays a vital role in the successful implementation of GPT. As countries aim to comply with the GPT's requirements and develop NAPs, they are likely to establish governance systems requiring policy and institutional reform. To fulfill their obligations, ADB can support governments to establish enabling frameworks for the GPT implementation. For example, policy-based and sectoral loans may be necessary to spur action on specific policies such as EPR and new or revised national standards or regulations for plastics in accord with the GPT.

**Leveraging ADB's financing facilities.** ADB's existing financing facilities can provide project preparation support through technical assistance, aligning with green and blue project criteria, and pooling public and private sector funds. DMCs will need to access financing to meet their GPT obligations, which may involve creating national-level management plans. ADB can leverage its initiatives like the Blue Southeast Asia (SEA) Finance Hub, Blue Pacific Finance Hub, the ASEAN Catalytic Green Finance Facility, and SME BlueImpact Asia to facilitate compliance with the GPT's requirements, without precluding further mechanisms that may be tapped by DMCs.

**Attracting private sector investment.** ADB can leverage the GPT to attract more private sector loans. Private sector investment plays a critical role in addressing plastic pollution. However, it is currently difficult to attract investment due to the lack of viable business cases and incentives. ADB operations can assist in the identification, preparation, and implementation of government and private sector actions and investments aimed at reducing marine plastic pollution under the GPT (footnote 33).

**Blue loans toward circular economy.** Investments in the private sector can be supported through blue loans. ADB has issued several blue loans to support the expansion of polyethylene terephthalate (PET) recycling capacity, including Indorama Ventures Group (IVG) for PET recycling expansion in India, Indonesia, the Philippines, and Thailand.<sup>34</sup> This aims to promote a circular economy for recycled PET and implement industry best practices in ADB's DMCs. A loan was also approved to PT ALBA Tridi Plastics Recycling Indonesia, an ALBA Group Asia company, to establish a PET recycling facility in Central Java, showing ADB's

<sup>32</sup> Alner. <https://www.alner.id/>.

<sup>33</sup> Verra. *The Role of Plastic Credit Finance in the Global Plastic Treaty*.

<sup>34</sup> ADB. 2020. *ADB, Indorama Ventures Sign \$100 Million Blue Loan to Boost Recycling, Reduce Ocean Plastic Waste*. News release. 24 November.

commitment to increasing financing in the sector.<sup>35</sup> Such loans also contribute to the goals of ADB's Action Plan for Healthy Oceans and Sustainable Blue Economies.

**Enhancing criteria for investments.** Private sector project assessment criteria and environmental due diligence must be enhanced to prepare for GPT implementation. Projects must have appropriate standards that incorporate environmental and social safeguard requirements and activities that effectively mitigate climate impacts and social risks across the plastic value chain. ADB's Ocean Finance Framework could provide operational direction in this regard, as it outlines a typology of blue economy sectors alongside limitations and boundaries. The framework also covers pollution control and circular economy projects and provides specific guidance on ADB criteria for investments.<sup>36</sup>

**Harmonizing finance standards.** ADB and other multilateral partners can consider developing a methodology for finance that aligns with the requirements of GPT. Currently, there are no standardized and institutionalized frameworks for policy tools and financing mechanisms such as EPR and plastic credits, as well as plastic waste management solutions such as digitization. There is an opportunity for ADB to work with partners to harmonize standards for finance, capacity building, and other means of implementation toward the GPT's goals.

## CONCLUSION

To address the escalating problem of plastic pollution and its contribution to climate change, decisive action must be taken at every stage of the plastic life cycle. This responsibility extends to all sectors of society, including national governments, civil society, consumers, businesses, and the informal sector across the plastic value chain.

However, while the costs and consequences of plastic pollution and climate change are borne by all, their impacts disproportionately affect individuals in the most impoverished countries, many of which are in Asia and the Pacific. This not only undermines global climate goals but also exacerbates inequalities in marginalized communities, which bear the brunt of the problem. Supporting investments toward the Paris Agreement and GPT goals would facilitate an inclusive transition of the informal sectors of society and contribute to poverty alleviation.

Sustainable finance is key to facilitating policy reform, development projects, and technologies to advance circular economy solutions, implementing the GPT, and addressing climate change. For Asia and the Pacific, ADB stands ready to support investments toward a just transition for all and achieve global, regional, and national climate and plastic pollution reduction ambitions.

<sup>35</sup> ADB. 2023. *ADB Signs \$44.2 Million Blue Loan with ALBA to Reduce Ocean Plastic Waste in Indonesia*. News release. 6 June.

<sup>36</sup> M. Walsh, D. Robertson, and A. Mehta. 2020. *The Role of Ocean Finance in Transitioning to a Blue Economy in Asia and the Pacific*. *Development Asia*. 8 June.

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Asian Development Bank  
6 ADB Avenue, Mandaluyong City  
1550 Metro Manila, Philippines  
[www.adb.org](http://www.adb.org)



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