Plastics Treaty Assist Toolkit

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Introduction

The plastic dilemma: a legacy of innovation and pollution

Plastics are among the most widely used materials in a broad variety of products and applications worldwide. They are essential for creating lightweight, durable materials that can improve transportation efficiency, reduce energy consumption, and provide cost-effective solutions across various aspects of daily life. Furthermore, plastics provide sterile packaging in the medical field, can help reduce food spoilage through protective packaging, support advancements in electronics, and play a vital role in the construction, automotive, and renewable energy sectors, driving innovation and sustainability.[1] Both plastic production and consumption have skyrocketed in recent decades, growing from 2 million tonnes in 1950 to 234 million tonnes in 2000, and reaching 435 million tonnes in 2020. This is expected to rise to 736 million tonnes by 2040.[2, 3]

Despite their widespread use in daily life, plastic pollution throughout the entire lifecycle poses risks to human health, biodiversity, climate and the environment. Green House Gases (GHG), harmful chemicals as well as macro- and microplastics are released during fossil fuel extraction, plastic production, recycling, incineration, and landfill decomposition, contributing to air, soil and water pollution. GHG-emissions from plastics account for 4 % of global emissions, with production responsible for 85 % of that total, raw material sourcing for 9 %, and waste management for 6 %.[4, 5] Of the 8.3 billion tonnes of plastic produced so far, 6.3 billion tonnes have become waste. Only 9 % of this waste has been recycled, 12 % incinerated, and the remaining 79 % has ended up in landfills or the environment.[6] It is estimated that 57 % of mismanaged plastic waste is openly burned, while 43 % becomes uncollected debris that can leak into the environment.[7] A lack of proper waste management has contributed to an estimated 152 million tonnes of plastic waste in rivers and oceans. Without urgent policy action, this figure could nearly double to 300 million tonnes by 2040.[8]

Fragmented rules, global consequences: the pathway towards a global plastics treaty

In the past two decades, global efforts to reduce plastic pollution have significantly increased. At least 129 countries have passed laws addressing various aspects of plastic use and waste management.[9] More than 1,400 laws have been enacted worldwide, at regional, national and local levels, to tackle plastic pollution.[10]

One major trend in these policies is the reduction of single-use plastics (SUPs), particularly through bans and fees, with a notable focus on single-use plastic bag bans. Economic tools like taxes and fees are often used alongside these measures. Extended Producer Responsibility (EPR) programs are also gaining traction globally.[11, 12] However, implementation of these policies is

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lagging in many areas, and policies addressing plastic leakage and microplastics remain limited. Furthermore, there is a need to strengthen the integration of a comprehensive lifecycle approaches into policy for greater effectiveness.[13]

So far, these fragmented actions have been insufficient to resolve the global plastic pollution crisis. Therefore, in March 2022 the UN Environment Assembly (UNEA) adopted Resolution 5/14, signalling countries' commitment to work through an intergovernmental negotiating committee (INC) towards an international legally binding instrument (ILBI) to combat plastic pollution along the full lifecycle of plastics.[14] The INC discussions have focused on several key measures, such as setting global targets for sustainable plastic production, regulating harmful chemicals and problematic plastics, designing products for more circularity, promoting sustainable alternatives, improving waste management and recycling as well as ensuring a just transition.

The GIZ plastics treaty assist toolkit (PTAT)

The PTAT equips policymakers and key stakeholders with the knowledge and practical tools needed to implement measures supporting the ambitious provisions under discussion in the INC. It presents information and examples on strategic frameworks, regulatory approaches and upstream and downstream interventions, organised across four focus areas and ten thematic sections.

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HOW TO USE THIS TOOLKIT

This Toolkit is structed into 4 chapters and 10 sub-sections:

a Setting the framework
- **a1** National Plans
- **a2** Baselines and Monitoring
- **a3** Finance
- **a4** Just Transition

b Addressing plastic production
- **b1** Chemicals and Polymers of Concern
- **b2** Problematic, Unnecessary and Avoidable Plastics

c Rethinking design and use of plastic products
- **c1** Product Design, Composition and Performance
- **c2** Alternative Products and Systems

d End-of-life management
- **d1** Waste Management
- **d2** Existing Plastic Pollution

The sections within the PTAT chapters provide content and onward links that target the following learning objectives.

1. **Introduction:** Understand why the specific topic is addressed in the Plastics Treaty discussions.
2. **Measures:** Familiarise with common policy and other measures that can be considered to tackle plastic pollution.
3. **Cases:** Profiling example cases to inform and guide understanding, analysis, and decisions.
4. **Tools:** Onward resources that help in assessing, implementing, and monitoring the effectiveness of measures that tackle plastic pollution.

While measures presented in chapter a (sections a1 – 4) follow their own individual logic, measures presented chapters b – d (sections b, c, d 1 – 2) are organised in five recurring **measure categories** that can be brought forward into the policy mix. Countries can combine these different measures to address their specific policy goals and ambitions.

Regulatory Measures

Economic and Fiscal Instruments

Collaboration and Voluntary Agreements

Awareness, Education and Behaviour change

Services and Infrastructure

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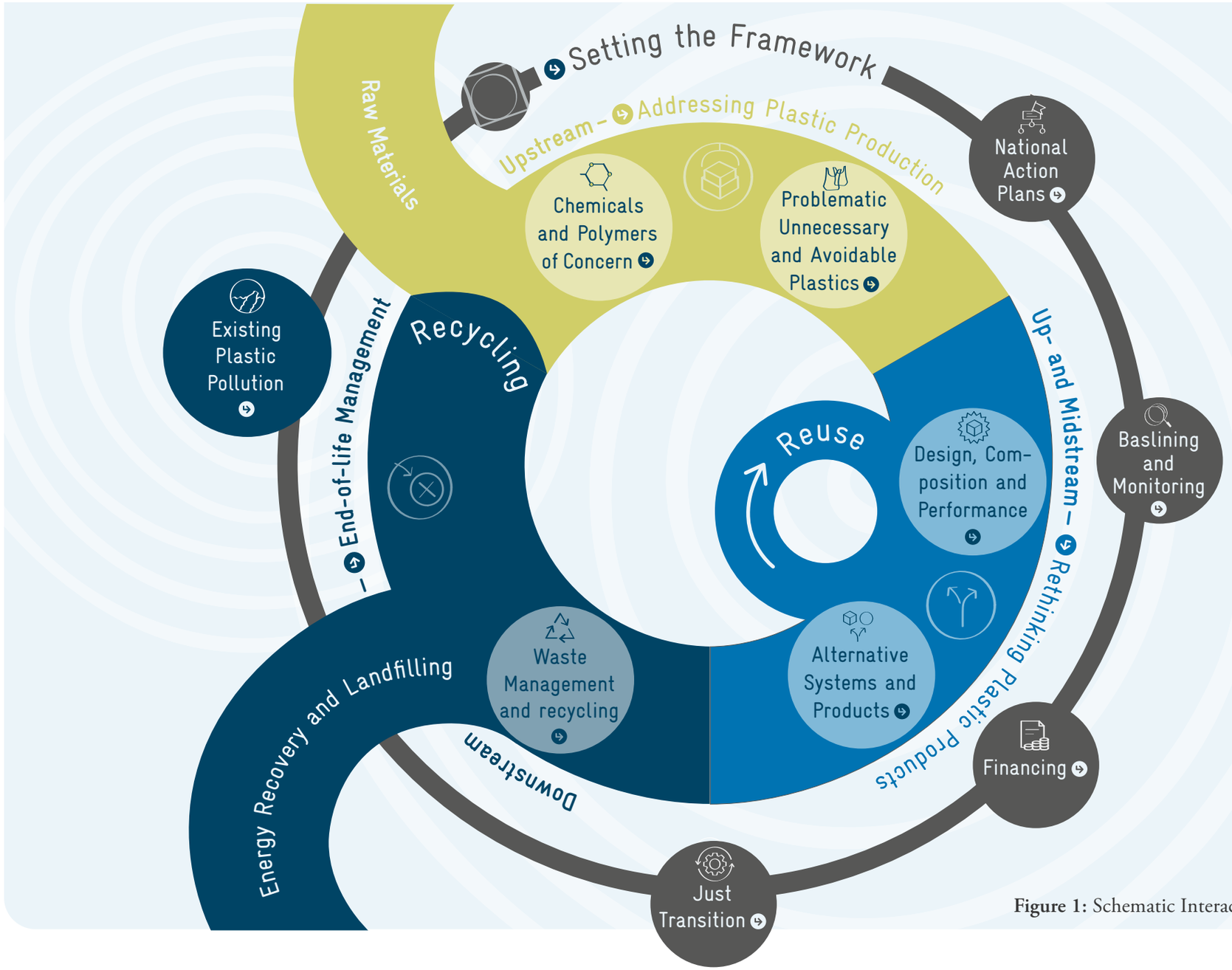

Figure 1: Schematic Interactiv Cycle of this Toolkit

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Further Reading:

- GIZ (2023): Towards Clean Oceans: Reducing Plastic Pollution through Circular Economy – Learning Experiences of GIZ and its partners
- GIZ (2023): Circular Solutions Finder – Proven Approaches to Address Key Circular Economy Challenges
- NegotiateAI: Smart Document Analysis Tool for the Plastic Treaty Negotiations
- Global Plastic Laws (n.d.): Database and Resource Library focused on plastic legislation around the world.
- WWF (n.d.): Plastic Smart Guide for Cities
- UNEP. (n.d.). Law and plastics toolkit.
- International Institute for Sustainable Development. (2025). A guide to the global agreement to end plastic pollution.

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2 **Geyer, R., Jambeck, J. R., & Law, K. L. (2017).** Production, use, and fate of all plastics ever made. *Science advances, 3*(7), e1700782, **https://doi.org/10.1126/sciadv.1700782**

3 **OECD (2024).** Policy Scenarios for Eliminating Plastic Pollution by 2040, *OECD Publishing, Paris,* **https://doi.org/10.1787/76400890-en**

4 **United Nations Framework Convention on Climate Change (UNFCCC) (2024).** A New Plastics Economy is Needed to Protect the Climate. *UN Climate Change News.* Retrieved June 10, 2025, from **https://unfccc.int/news/a-new-plastics-economy-is-needed-to-protect-the-climate**

5 GRID-Arendal (2024). Climate Impacts of Plastics: Global actions to stem climate change and end plastic pollution. *GRID-Arendal.* **https://gridarendal-website-live.s3.amazonaws.com/production/documents/:s_document/1076/original/ClimateImpactsOfPlastics.pdf?1712740463**

6 See endnote 2.

7 **Cottom J.W., Cook, E., and Velis C.A (2024).** A local-to-global emissions inventory of macroplastic pollution. *Nature, 633,* 101 – 108. **https://doi.org/10.1038/s41586-024-07758-6**

8 See endnote 3.

9 **Karasik, R., Bering, J., Griffin, M., Diana, Z., Laspada, C., Schachter, J., Wang, Y., Pickle, A., Virdin, J. (2022).** Annual Trends in Plastics Policy: A Brief. *Duke University.* **https://hdl.handle.net/10161/24492**

10 **Global Plastic Laws. (n.d.).** Global Plastic Laws Database. Retrieved June 10, 2025, from **https://www.globalplasticlaws.org/map**

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11 See endnote 9.

12 **Virdin, J. , Karasik, R., Vegh, T., Pickle, A., Diana, Z., Rittschof, D., Bering, J., Caldas, J., (2020).** Responses to the Global Plastic Pollution Problem: The Plastics Policy Inventory. *Duke University.* **https://hdl.handle.net/10161/21347**

13 See endnote 12.

14 **United Nations Environment Assembly (UNEA). (2022).** End plastic pollution: Towards an international legally binding instrument (UNEP/EA.5/RES.14). United Nations. **https://digitallibrary.un.org/record/3999257?v=pdf**

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Setting the Framework

National Plans or National Action Plans (NAPs) offer a structured framework to support decision-makers in setting objectives, implementing policies, assigning responsibilities, and allocating resources to address specific policy challenges. They are commonly used as key tools to translate global commitments from multilateral agreements into concrete national strategies. NAPs enable countries to assess their specific challenges and capacities, set priorities, and define clear timelines for implementation. Additionally, they function as instruments to promote transparency and accountability at both national and international levels.[1]

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INSTITUTIONAL ARRANGEMENTS, ACTIONABLE TARGETS AND MEASURES | see case 1 | see case 2 | see tool 1

NAPs generally include key policy measures backed by legislative, regulatory, or voluntary tools. They describe the institutional arrangements needed for implementation, such as the creation of dedicated structures like task forces or working groups. These arrangements help improve coordination and streamline decision-making across government agencies.

The measures outlined in NAPs are typically broken down into specific, actionable steps, grouped by priority area. Common themes include waste prevention and reduction, the promotion of reuse, and the development and adoption of alternatives and substitutes to conventional plastic products. Research and innovation throughout the plastics life cycle are also key areas of focus. A clear financial framework is also essential, involving the allocation of national resources and the mobilisation of external funding and private sector investments.

In addition to government-led efforts, NAPs often encourage voluntary and collaborative initiatives with the private sector. These partnerships span the entire plastics value chain and can provide valuable support for research, development, and implementation of circular economy solutions.

BASELINES, MONITORING AND EVALUATION

Establishing baselines and a robust monitoring framework is vital to track progress. This includes the systematic collection, analysis, and reporting of data across the plastics value chain, covering aspects such as production, trade, consumption, waste generation, littering, and environmental pollution. Regular monitoring helps evaluate the effectiveness of implemented policies and investments, informs necessary adjustments, and ensures that national targets remain realistic and achievable.

STAKEHOLDER ENGAGEMENT

The active involvement of key stakeholders during the preparation and revision of NAPs enhances their quality and feasibility. Private sector actors, civil society organisations, and representatives of the informal recycling sector all contribute valuable perspectives. Their participation ensures that the plan is inclusive, socially just, and grounded in practical realities.

CAPACITY BUILDING

To ensure effective implementation, NAPs often include targeted capacity-building efforts. These may consist of training programmes for relevant authorities and the strengthening of technical and operational capacities within institutions. Mechanisms for improved inter-agency cooperation are frequently established to support coordinated delivery.

INTERNATIONAL COOPERATION AND PARTNERSHIPS

Exchanging technical expertise and sharing data within and between countries helps build on successful experiences. Multi-stakeholder platforms such as the Global Partnership on Plastic Pollution and Marine Litter (GPML) and the Global Plastic Action Partnership (GPAP) bring government, private sector and civil society together under a unified platform which can support the mobilisation of funding and technical support. | see case 3 Aligning policies, mechanisms, and standards through transnational cooperation also contributes to creating more consistent market conditions for manufacturers and importers. | see case 4

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a Setting the Framework

b Addressing Plastic Production

c Rethinking Design and Use of Plastic Products

d End-of-Life Management

a1 NATIONAL PLANS | a2 BASELINING AND MONITORING | a3 FINANCING | a4 JUST TRANSITION

↳ a1.1 INTRODUCTION ↳ a1.2 MEASURES **a1.3 CASES** ↳ a1.4 TOOLS ↳ a1.5 REFERENCES

CASE 1 **NATIONAL ACTION PLAN ON MARINE LITTER, PHILIPPINES**

The National Plan of Action on Marine Litter was adopted by the Government of the Philippines in 2021. It acknowledges the need for more coordinated and unified efforts among stakeholders to address marine litter. The plan serves as a strategic blueprint to strengthen existing initiatives in resource and waste management, while also addressing the issue of waste leakage into aquatic environments. Its overarching goal is to achieve zero waste in Philippine waters by 2040. The plan sets out ten key strategies to guide implementation:[2]

- Establish science and evidence-based baseline information on marine litter.
- Mainstream circular economy and sustainable consumption and production initiatives.
- Enhance recovery and recycling coverage and markets.
- Prevent leakage from collected or disposed waste.
- Reduce maritime sources of marine litter.
- Manage litter that already exists in the riverine and marine environments.
- Enhance policy support and enforcement for marine litter prevention and management.
- Develop and implement strategic and targeted social marketing and communications campaigns using various media.
- Enable sufficient and cost-effective financing and other institutional resource requirements for the implementation of the Action Plan.
- Strengthen local government unit capacities and local-level implementation of the Action Plan.

CASE 2 **NATIONAL ACTION PLAN ON MARINE LITTER, VIET NAM IN DECEMBER 2019, VIET NAM ADOPTED ITS NATIONAL**

Action Plan for the Management of Marine Plastic Litter by 2030. The plan sets out a comprehensive approach to eliminating plastic pollution from both land-based and ocean-based sources, positioning Viet Nam as a regional leader in addressing marine plastic litter. It outlines specific targets, including a 75 % reduction in marine litter, 100 % collection of lost or discarded fishing gear, and the prevention of single-use plastics and non-biodegradable plastic bags. The plan also promotes nationwide clean-up campaigns and establishes a monitoring system for marine plastic debris, with a particular focus on tourist areas – aiming for 100 % of these locations to be plastic-free by 2030.[3]

The NAP outlines five key areas of action:

- raising public awareness and promoting education,
- improving plastic waste management from coastal and ocean-based activities,
- reducing plastic litter at the source,
- strengthening international cooperation, and
- advancing scientific research and investigation.

CASE 3 **THE GLOBAL PLASTIC ACTION PARTNERSHIP (GPAP) AND THE NATIONAL PLASTIC ACTION PARTNERSHIP (NPAP)**

Model by World Economic Forum The Global Plastic Action Partnership (GPAP), hosted by the World Economic Forum, is a multi-stakeholder platform designed to help countries transition from linear economic models to closed-loop circular systems, thereby reducing the global impact of plastic pollution. At the national level, GPAP is implemented through National Plastic Action Partnerships (NPAPs), which serve as country-specific secretariats. These partnerships engage national governments, businesses, and other stakeholders involved in waste management and the circular plastics economy.

NPAPs provide collaborative platforms to catalyse initiatives, attract funding, and scale up in-country efforts to tackle plastic waste and pollution. Initially piloted in Viet Nam, Indonesia, and Ghana, the network had expanded to 25 national partnerships by the end of 2024. Each NPAP is uniquely structured to reflect local conditions, including governance frameworks and value chain dynamics.[4]

A core function of NPAPs is the development of National Action Roadmaps – evidence-based strategies that guide countries in setting and implementing targets for plastic waste reduction and circularity. The roadmap process typically involves four key steps:[5]

- **Establishing baselines:** Comprehensive assessments are conducted to map national plastic flows and identify major leakage points.
- **Engaging stakeholders:** A broad range of actors – such as policymakers, business leaders, civil society organisations, and waste sector representatives – are brought together to align on priorities and commitments.
- **Setting targets and milestones:** Clear, measurable objectives are defined to reduce plastic pollution and increase recycling and reuse rates.
- **Mobilising and aligning investment and implementation support:** Financial resources are identified and secured to develop waste management infrastructure and advance circular economy solutions that support the achievement of national targets.

a1 NATIONAL PLANS | a2 BASELINING AND MONITORING | a3 FINANCING | a4 JUST TRANSITION

↳ a1.1 INTRODUCTION ↳ a1.2 MEASURES **a1.3 CASES** ↳ a1.4 TOOLS ↳ a1.5 REFERENCES

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CASE 4 **TRANSNATIONAL AND REGIONAL ACTION PLANS**

Transnational and regional marine litter action plans can support national governments in aligning their NAPs with regional and global frameworks. Examples of existing transnational action plans include:

- UN Environment (2018): Western Indian Ocean Regional Action Plan on Marine Litter
- COBSEA (2018): COBSEA Regional Action Plan on Marine Litter 2019 (RAP MALI)
- HELCOM (2021): Baltic Sea Action Plan
- Barcelona Convention (2021): Regional Plan on Marine Litter Management in the Mediterranean
- OSPAR (2022): OSPAR's Second Regional Action Plan for the Prevention and Management of Marine Litter in the North-East Atlantic (RAP ML 2)
- G20 (2017): G20 Action Plan on Marine Litter

TOOL 1 GUIDANCE AND RESOURCES FOR DEVELOPING NATIONAL ACTION PLANS ON PLASTIC AND MARINE LITTER

There is a growing catalogue of resources and guidelines to assist national governments in developing their own NAPs. A selection of guidelines is presented in **Table 1:**

GPML (2019): **Guidelines for the Development of Action Plans on Marine Litter**	Provide a structured framework for developing national action plans. Emphasise evidence-based strategies, stakeholder engagement, and policy integration.
University of Portsmouth (2024): **Seven Building Blocks for a successful National Action Plan to address plastic pollution**	Identifies challenges faced by NAPs under previous environmental treaties. Offers recommendations to enhance NAP effectiveness under the Global Plastics Treaty.
World Bank (2024): **Navigating Plastic Management: Tools for Government Action Planning**	Outlines four key steps for action planning: · Analyse the scale and context of plastic pollution. · Assess and prioritise solutions; set targets. · Determine financial requirements. · Implement actions and monitor progress. Recommends combining appropriate tools for each step.
International Maritime Organisation (2023): **Guidance Document on Developing a National Action Plan on Sea-Based Marine Plastic Litter**	Provide a structured methodology for preparing NAPs. Highlight essential steps and considerations for comprehensive strategies.
UNEP (2018): **Combating Marine Plastic Litter and Microplastics**	Evaluates the effectiveness of international, regional, and sub-regional governance approaches related to marine litter.

G20 (2023): **G20 Report on Actions against Marine Plastic Litter**	Assesses actions taken under the G20 framework. Includes best practices for addressing marine plastic litter
SPREP (2018): **Regulating plastics in Pacific Island Countries – A Guide for policymakers and legislative drafters**	Summarises national-level plastic policy approaches in Pacific Island Countries.
UNFCCC (2012): **LDC Expert Group Technical Guidelines for the national adaptation plan process**	Offer an adaptable, iterative approach for developing NAPs. Include four flexible components: A. Groundwork and gap analysis B. Preparatory elements C. Implementation strategies D. Reporting, monitoring, and review

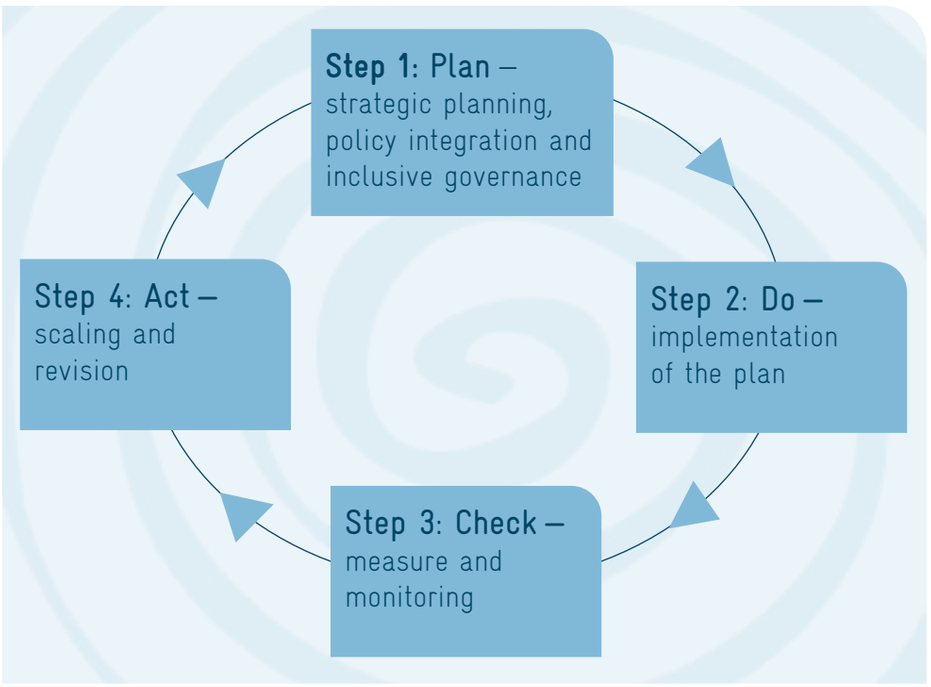

Figure 2: Schematic PDCA Cycle for Policy Measures and Action Planning

Figure 2 aligns recommended steps from NAP guidelines with the conceptual framework of the PDCA cycle (Plan – Do – Check – Act). The PDCA cycle is a widely used framework in international management systems such as ISO 9001, ISO 14001, ISO 50001 and the Ecosystem-Based Management System.[6] When applied to NAPs, the PDCA cycle supports governments in developing targeted policies, monitoring progress, and adapting responses to emerging challenges across the plastic lifecycle.

Step 1: Plan – strategic planning, policy integration and inclusive governance

Effective planning begins with identifying key challenges through data and impact assessments. Based on this evidence, strategic goals, targets, and measures are defined. Integrating existing policies and frameworks, along with stakeholder engagement, improves alignment and legitimacy.

Key activities include:

- Establishing a technical steering comittee
- Conducting baseline assessments on plastic production, consumption, and pollution.
- Reviewing and integrating existing policies and international best practices.Assessing economic, social, environmental, and health impacts.
- Defining national priorities, targets, actions, and responsibilities.
- Developing a monitoring and evaluation framework with clear indicators.
- Establishing institutional and financial frameworks for implementation.

Step 2: Do – implementation of the plan

Strategic priorities are translated into concrete actions. Policy measures are rolled out alongside supporting tools such as awareness campaigns. Pilot projects can be used to test selected approaches before wider application.

Key activities include:

- Enacting regulations and voluntary initiatives.
- Launching support measures and public awareness campaigns.
- Allowing for policy adjustments based on early outcomes and feedback.

Step 3: Check – Measure and Monitoring

Regular monitoring ensures that progress is measured and informs decision-making. Evaluation against baselines and ongoing stakeholder input supports learning and continuous improvement.

Key activities include:

- Conducting regular assessments against baseline data.
- Sharing results and comparing progress with regional and international benchmarks.

Step 4: Act – Scaling and Revision

Lessons learned are used to refine strategies and improve future implementation. Successful actions can be scaled, and underperforming ones revised.

Key activities include:

- Revising strategies based on evaluation outcomes.
- Strengthening governance and institutional arrangements.
- Enhancing regional and international collaboration.

Further Reading:

- → GPML (n.d.): Knowledge Library National Action Plans | UNEP GPML Digital Platform
- → Common Seas & University of Portsmouth (2024): Delivering an effective Global Plastics Treaty through coordinated national action
- → IUCN, CIEL & WCEL (2023): National Implementation Plans and National Action Plans: Key Elements to Consider in the Context of a Treaty to End Plastic Pollution
- → Global Plastics Policy Centre (2025). Insights paper: Effective national planning to coordinate action on plastic pollution by the National Planning Working Group for Plastics Action

1 **March, A., Nieminen, L., Arora, H., Walker, T.R., Shejuti, S. M., Tsouza, A., Winton S. (2023).** Effectiveness of national action plans | Global Plastics Treaty Policy Brief. *Global Plastics Policy Centre and Dalhousie University.* **https://plasticspolicy.port.ac.uk/research/national-action-plans**

2 **Philippine Department of Environment and Natural Resources (DENR). (2021).** Philippines National Plan of Action for the Prevention, Reduction, and Management of Marine Litter. **https://seaknowledgebank.net/e-library/philippines-national-plan-action-prevention-reduction-and-management-marine-litter**

3 **Vietnamese Ministry of Natural Resources and Environment (MONRE). (2020).** National Action Plan for Management of Marine Plastic Litter By 2030. **https://www.undp.org/vietnam/publications/national-action-plan-management-marine-plastic-litter-2030**

4 **World Economic Forum. (2025).** 25 Countries Unite in the Fight Against Plastic Pollution. **https://www.weforum.org/press/2025/01/25-countries-unite-in-the-fight-against-plastic-pollution/**

5 **World Economic Forum. (2021).** Global Plastic Action Partnership Shaping a circular economy for plastics – from source to sea. **https://www3.weforum.org/docs/WEF_FOA_GPAP.pdf**

6 **Sarda, R., O'Higgins, T., Cormier, R., Diedrich, A., Tintoré, J. (2014).** A proposed ecosystem-based management system for marine waters: linking the theory of environmental policy to the practice of environmental management. *Ecology and Society* 19(4):51. **http://dx.doi.org/10.5751/ES-07055-190451**

Creating national inventories and baselines for plastics is key to making informed decisions. Baselines provide policymakers with a clear understanding of the sources and extent of plastic pollution, helping them identify problem areas, set realistic targets, and prioritize effective actions. Once baselines and targets are in place, regular monitoring becomes essential to assess progress, fine-tune strategies, and adjust measures as needed.

Effective baselining and monitoring of plastics require a systematic approach to data collection, analysis, and reporting, tailored to the local context. This includes gathering data from both upstream activities (such as extraction, production, and distribution) and downstream processes like waste management and recycling. It is important to recognize that pollution can occur at any stage in the plastic lifecycle.

The impact of policies can be measured through both qualitative and quantitative methods, particularly by tracking plastic leakage. However, establishing a comprehensive evaluation system requires resources, which requires alignment of monitoring efforts with available capabilities. Understanding how plastics enter the environment is vital for developing targeted interventions, and ongoing monitoring can help refine these strategies while tracking overall progress.

A successful monitoring framework should include clear indicators and practical methods for accurate, high-quality data collection. It is important to balance the data requirements with local capabilities and available resources. Building national databases that cover the entire plastic lifecycle is essential for understanding how plastics flow over time. While data can be sourced from various stakeholders, such as national agencies, producers, retailers, waste operators, and others, many data gaps still exist, especially in low-income and underserved regions.

Developing national baselines involves collecting existing data on plastic flows across the entire plastic lifecycle. Indicators should ideally be disaggregated by polymer type (e.g. PET), product category (e.g. bottles), and associated emissions. Although various tools exist to assess the sources and occurrence of plastic pollution, quantifying how much plastic enters the environment remains a persistent challenge. | see case 6 | see case 7 | see tool 2 | see tool 4

TRACKING PLASTIC PRODUCTION | see tool 3

Plastic production can be monitored using manufacturing statistics. However, reliable data on upstream production is often lacking. Available figures are frequently expressed in monetary terms, whereas mass-based data would provide a more accurate basis for planning and interventions. Production can be categorised using International Standard Industrial Classification (ISIC) or Central Product Classification (CPC) codes. Key indicators include total plastic production and a breakdown by product and polymer types. In the absence of official statistics, national production estimates may be derived from manufacturing capacity combined with import figures.

ASSESSING IMPORTS AND EXPORTS

Trade data offers insights into the flow of plastics into and out of a country. Customs records – based on the Harmonised System (HS) or national nomenclatures – can be used to track plastic goods and raw materials. Like production data, trade statistics are often presented in terms of value, leading to a gap in quantity-based data crucial for environmental planning.

ESTIMATING PLASTIC CONSUMPTION

By combining production and trade data, countries can estimate total plastic consumption, and the volume of plastic placed on the market. Indicators may include total consumption disaggregated by product and polymer type. In the absence of complete datasets, unified modelling methodologies can be applied to generate estimates of national or regional plastic consumption and waste generation.

INCORPORATING CORPORATE DISCLOSURE FRAMEWORKS

Corporate plastic waste disclosure can complement national data systems. Although no universal framework currently exists, many companies voluntarily measure and report their plastic footprints and progress on circular economy goals. These disclosures can inform national interventions and improve transparency.

UTILISING DATA FROM WASTE MANAGEMENT SERVICE PROVIDERS

Data from waste management service providers and facility operators is essential for establishing accurate baselines and monitoring progress. Information on waste collection, sorting, treatment, recycling, and disposal provides critical insights into the quantities and types of plastic waste managed across the country. These data help identify inefficiencies, track improvements over time, and support the design of more effective policy interventions. Integrating operational data into national monitoring systems also enhances transparency and supports evidence-based decision-making.

QUANTIFYING PLASTIC EMISSIONS AND LEAKAGES

Accurate estimates of plastic emissions and leakage pathways are essential for effective intervention planning. Identifying key leakage points – supported by robust data – enables policymakers to design targeted responses and allocate resources efficiently.

IDENTIFYING HOTSPOTS AND ACCUMULATION ZONES

Mapping plastic pollution hotspots supports the optimisation of waste management systems and targeted awareness-raising campaigns. Specialised programmes can be launched to identify and assess accumulation zones. The use of standardised methodologies and data protocols ensures consistency and comparability of results.

MARINE LITTER MONITORING AND STATE OF THE ENVIRONMENT REPORTING

Marine litter monitoring programmes can inform national marine litter baselines and contribute to environmental reporting. While such programmes often focus on sea-based sources and provide limited data on land-based inputs, they remain valuable. Due to the transboundary nature of marine litter, attributing waste to specific countries remains difficult. Nonetheless, several survey methods are available to support data collection.

CITIZEN SCIENCE AS A SUPPLEMENTARY DATA SOURCE

Citizen science, particularly through volunteer beach clean-ups, can help address data gaps at low cost. Although the data quality may not match that of professional surveys, citizen-led monitoring offers wide geographic coverage and long-time series, enabling analyses that might otherwise be unfeasible.[1]

LEVERAGING DIGITAL TOOLS FOR MONITORING

Digital technologies are playing an increasing role in monitoring plastic pollution. Remote sensing tools, such as drones, simple surveillance cameras, and satellite imagery, are being used to track marine litter, detect hotspots, and monitor landfills.[2] Digital platforms can also be developed at the national level to support data collection, sharing, and reporting.

HARMONISING MONITORING APPROACHES

Unified methods for monitoring and reporting are essential for providing consistent and comparable data across different environments. Collaborative efforts can develop guidance and tools to harmonise data collection and reporting. Involving experts and diverse stakeholders through workshops and networking enhances knowledge exchange and broadens participation.

CASE 5 **EU MARINE STRATEGY FRAMEWORK DIRECTIVE**

Under the Marine Strategy Framework Directive (MSFD), EU Member States are legally required to monitor marine litter along their coastlines as part of broader efforts to assess and protect the marine environment. Monitoring focuses on macro litter (items larger than 2.5 cm) and follows standardised protocols developed by the Technical Group on Marine Litter. This includes regular surveys on designated reference beaches, conducted at least four times a year, using harmonised data sheets based on the Joint List of Litter Items. Results are expressed as the number of litter items per 100 metres of coastline. Data are reported through platforms such as EMODnet and Marine LitterWatch, with coordination by the European Environment Agency and the Joint Research Centre.

According to the 2025 EU Coastline Macro Litter Trend Report, the amount of macro litter on EU coastlines decreased by 29 % between the baseline period (2015 – 2016) and the assessment period (2020–2021).[3]

This notable reduction reflects the combined impact of multilateral, national, regional, and citizen-led efforts. It demonstrates the effectiveness of the directive in supporting the achievement of good environmental status – a core objective of the MSFD. The results also provide robust, harmonised data to help Member States define and update national quantitative targets, guiding both current and future measures to reduce marine pollution.

CASE 6 **NATIONAL BASELINE SURVEY ON MARINE LITTER, LEBANON**

To build the scientific foundation for effective marine litter mitigation, Lebanon's Ministry of Environment, with support from the World Bank, conducted a comprehensive national baseline survey in 2021. This was the country's first large-scale, multi-method assessment of marine litter sources, pathways, and hotspots. It combined data collection from terrestrial, beach, and marine environments to provide an integrated understanding of the issue along Lebanon's coastline.

The findings revealed that between 70 % and 88 % of marine litter collected originated from land-based sources, rather than from the sea. Notably, over 95 % of branded litter items were linked to domestic products, confirming the predominantly national origin of the pollution. The survey also identified 73 new uncontrolled waste disposal sites along 14 rivers flowing into the Mediterranean, highlighting both poor waste management and river systems as key pathways for plastic leakage.

Based on these results, the report concluded that tackling marine litter in Lebanon requires upstream interventions. Key recommendations include transitioning from uncontrolled to controlled waste disposal, expanding urban waste collection services, and promoting behaviour change among beachgoers. This case underscores the importance of robust baselines in diagnosing pollution sources, identifying hotspots, and guiding strategic national responses.[4]

CASE 7

ESTABLISHING NATIONAL BASELINES THROUGH THE GPAP FRAMEWORK

National plastic baselines have been developed in over ten countries through the GPAP network, using the National Analysis and Modelling tool (NAM-Tool). This tool is based on the methodology outlined in the Breaking the Plastic Wave Report and aligned with the UNEP & IUCN National Guidance for Plastic Pollution Hotspotting.

The baseline assessments map current flows of plastic municipal solid waste, enabling countries to project future trends and assess progress in advancing plastics circularity. The analysis also identifies capacity and infrastructure gaps, prioritises areas for action, and quantifies plastic leakage into the environment under different scenarios. While data availability and transparency remain common challenges, the baseline process follows a multi-stakeholder approach. Results and projections are validated in-country, ensuring credibility and relevance for national planning.[5]

CASE 8 **DATA GENERATION THROUGH CITIZEN SCIENCE**

Citizen science has emerged as a powerful, low-cost tool for filling data gaps, empowering communities, and guiding policy. By training volunteers and using harmonised protocols, these initiatives ensure regular generation of comparable data while fostering environmental literacy.

East Pacific – Científicos de la Basura

The *Científicos de la Basura* programme mobilised thousands of volunteers along over 12 000 km of coastline across 11 Latin American countries. Participants are trained and follow standardised protocols, enabling robust collection of data on beach litter composition and distribution. This large-scale, cross-border effort not only generates valuable scientific insight but also promotes environmental education and public engagement.[6]

Europe – Plastic Pirates – Go Europe!

Funded by the EU and coordinated by multiple research institutions, Plastic Pirates – Go Europe! began through a collaboration between Kieler Forschungswerkstatt in Germany and Científicos de la Basura.[7] Engaging school classes and youth groups across more than a dozen European countries, participants follow standardised protocols to collect and analyse litter in rivers and coastal areas. The verified data support policy development, scientific literacy, and environmental stewardship among Europe's youth.[8]

Brazil – National Clean-Up Protocol

In Brazil, the Ministry of Environment and GIZ's TerraMar programme organised around 50 clean-up efforts targeting beaches and mangroves. Data collected by volunteer teams were systematised to develop a national monitoring protocol for beaches, riverbanks, and mangroves. This protocol and its accompanying practical guide now support other institutions in organising clean-ups.[9]

Africa – African Litter Monitoring Manual

To standardise data collection across the continent, the Sustainable Seas Trust and regional partners developed the African Litter Monitoring Manual. This resource offers accessible, consistent methods for monitoring litter on land, in waterways, beaches, and mangroves—empowering citizen scientists, communities, and professionals regardless of local capacity.[10]

Australia – AUSMAP

The Australian Microplastic Assessment Project (AUSMAP), led by the Total Environment Centre, engages more than 10 000 volunteers from students, community groups, and councils. Using research-grade, standardised sampling methods, volunteers collect data on microplastic pollution at over 400 sites across coastal and urban environments. The resulting high-resolution hotspot map is publicly accessible and has informed local policies, supported single-use plastic bans, and empowered community action.[11]

CASE 9

ADVANCING UNIFIED MONITORING THROUGH COMMUNITIES OF PRACTICE

Significant progress toward a coordinated, interdisciplinary, and holistic approach to plastic monitoring – across both terrestrial and marine environments – has been made through two Communities of Practice hosted on the **GPML Global Plastics Hub**.

The **Community of Practice on Plastic Monitoring and Assessment Harmonisation** supports harmonisation, interoperability, and data comparability across all stages of the plastic lifecycle, with potential subgroups focusing on plastics in the economy, plastic waste, and plastics in the environment.

Additional Communities of Practice may be established in the future to support other treaty-related obligations and thematic areas.

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The **International Ocean Colour Coordinating Group (IOCCG) Task Force on Remote Sensing of Marine Debris and Litter** brings together experts from academia, industry, government, civil society, non-profit organisations, and space agencies. The Task Force plays a key role in advancing the use of remote sensing technologies for monitoring plastic pollution in aquatic environments.

Through thematic workshops and networking events, the group fosters collaboration and knowledge exchange. A core focus is stakeholder engagement, ensuring that user needs are well understood while clearly communicating the capabilities and limitations of remote sensing as a complementary monitoring tool.

TOOL 2 OVERVIEW OF TOOLS FOR ASSESSING PLASTIC POLLUTION

Monitoring plastic waste streams requires systems that can effectively track and evaluate the generation, collection, recycling, and disposal of plastic waste. A variety of tools are available to support these assessments, each offering different functionalities and applications. Three key studies by GIZ and the World Bank provide detailed analyses of these tools, highlighting their capabilities and potential use cases:

Link:

- GIZ (2022): **Benchmark of Plastic Hotspotting Methodologies**
- World Bank (2024): **Navigating Plastic Management Tools for Government Action Planning**
- World Bank (2024): **Plastic Pollution Assessment Methodologies Suitability Toolkit (PLAST)**

Here we highlight 3 different tools that can be used at the regional and global, national and municipal level:

Global and Regional Level:

Spatio-temporal quantification of Plastic pollution Origins and Transportation model tool (SPOT)

SPOT is a fully integrated, GIS-based modelling tool designed to identify plastic pollution hotspots worldwide. It combines measured municipal-scale activity data with socio-economic indicators to estimate missing data through quantile regression random forest machine learning. These estimates feed into a probabilistic material flow analysis model that traces the movement of plastic waste across the globe – from the point of generation through diverse waste systems.

SPOT Model

Spatio-temporal quantification of plasticpollution origins and transportation

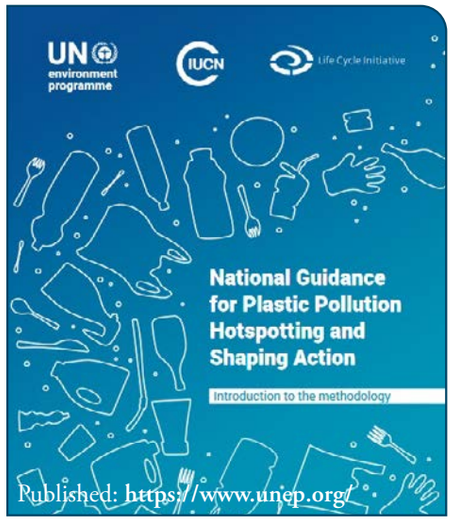
The model estimates plastic waste emissions from five system components across 60,000 municipalities. After emissions are calculated, SPOT maps plastic movement at raster resolution, considering environmental variables such as wind speed, surface runoff, land use, terrain, and river networks. It also accounts for the physical properties of different plastic items, enabling detailed and location-specific modelling of plastic leakage pathways.

National level:

National Guidance for Plastic Pollution Hotspotting and Shaping Action

The National Guidance for Plastic Pollution Hotspotting and Shaping Action, developed by UNEP and IUCN in 2022, offers a comprehensive framework to identify plastic pollution hotspots and support evidence-based policy development. The tool enables users to gather data, conduct detailed analyses, and design targeted policy measures to reduce plastic leakage across sectors and geographic regions.

The Guidance comprises three main components:



- A methodological report providing an overview and a quick reference guide
- Nine technical modules in PowerPoint format, outlining methods for scoping, data collection, and modelling.
- Spreadsheet-based tools to facilitate data entry, analysis, and visualisation of results.

The methodology has been piloted in countries including Kenya, Mozambique, Viet Nam, and Spain, demonstrating its practical value in shaping national action plans and informing targeted interventions. Pilot reports and toolkits are publicly available for download.

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Municipal Level:

Waste Flow Diagram (WFD) – A Rapid Assessment Tool for Plastic Leakage at Municipal Level

The WFD, developed in 2020 by the University of Leeds, Eawag-Sandec, Wasteaware, and GIZ, is a low-cost, rapid assessment tool designed to estimate plastic leakage into the environment – especially in low- and middle-income cities. It provides a clear visualisation of municipal solid waste (MSW) flows, identifying both sources and pathways of plastic pollution. The tool combines material flow analysis with observation-based data collection to deliver actionable insights.

Since its launch, the WFD has been applied in over 150 cities and is adaptable for national-level use. Recent updates include integration of climate emissions data from open burning. The tool is accessible through a dedicated website and online portal offering case studies, training materials, a measures catalogue, and a simulation tool for national scenarios.

The WFD is designed to align with other tools such as the SDG 11.6.1 Waste Wise Cities Tool (WaCT) and contributes to monitoring SDG indicators 11.6.1 (controlled waste management), 12.5.1 (recycling rates), and 14.1 (marine pollution). Through an API, it enables data exchange with WaCT and can feed into the AI-based SPOT model for global macroplastic emissions.

Link:

- WFD: Website
- WFD: Online Data Portal

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TOOL 3 **RECOTRACE – PLASTIC RECYCLING TRACKING SYSTEM IN EUROPE**

RecoTrace is an online data collection system developed by PolyREC, a pan-European non-profit association representing the plastics industry. It is designed to track the movement of primary plastic polymers and recycled materials throughout the plastics value chain in Europe. The system monitors both the volume of plastics recycled and how recycled materials are subsequently used.

RecoTrace provides several key benefits for companies in the European plastics sector:

- It enables transparent tracking of progress toward circularity goals.
- It supports reporting towards the Circular Plastics Alliance target of using 10 million tonnes of recycled plastics in Europe by 2025.
- It helps companies monitor compliance with national recycling targets, both mandatory and voluntary.

To ensure data reliability, users are encouraged to certify reported volumes through approved schemes such as EuCertPlast or RecyClass. The system captures detailed information across the recycling chain, including inputs and outputs at both recycler and converter levels.

Link:

- **RecoTrace:** User Tools

TOOL 4 KEY PERFORMANCE INDICATORS FOR MONITORING PLASTICS ACROSS THE LIFECYCLE

Effective management of plastic production and waste is essential to addressing environmental challenges. Key Performance Indicators (KPIs) are crucial for assessing the impact and effectiveness of policy measures across the plastics lifecycle—from production and consumption to disposal and environmental leakage.

The table below presents a selection of KPIs covering areas such as plastic production volumes, waste generation, recycling rates, and their relevance to marine litter and circular economy goals. While some of these indicators are already in use within existing monitoring systems, others have been proposed by expert groups, such as the GPML Community of Practice on Data Harmonisation, to guide future monitoring and reporting efforts.

KPI	Typical Units	Data source
Plastic primary production		
Plastic production	Kt/year	Data from producers, Data submitted to national and regional authorities and Industry Compliance Schemes, import/export statistics, secondary data from relevant reports: Data Source Examples: **GPML:** Data Hub **OECD:** Data Explorer **Plastics Europe:** Market Data **UC Santa/Barbara:** Global Plastic Policy AI Tool
Total plastic imported/exported (further categories for breakdown: plastics in primary/intermediate forms, final/intermediate plastic goods)	$/year Kt/year	UN Comtrade, Custom Data, HS Codes, Data Source Example: **UNCTADstat:** Spotlight on selected plastic trade trends **GPML:** Data Hub

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KPI	Typical Units	Data source
Plastic consumption		
Total plastic consumption	Kt/year	Retail sales data, industry reports Data Source Examples: **Plasteax: Platform for plastic environmental analytics (to be purchased)**
Plastic consumption per industry type/sector based on ICIS classification	Kt/year	National data sets, Retail sales data, industry reports Data Source Example: **Plasteax: Platform for plastic environmental analytics (to be purchased)**
Plastic imported/exported (by sector)	Kt/year	UN Comtrade, Custom Data, HS Codes
Plastic products in primary forms	Kt/year	National data sets
Semi-finished plastic products	Kt/year	National data sets
Finished plastic products (100 % plastics)	Kt/year	National data sets
Plastic embedded in plastic-containing products	Kt/year	UNITAR Statistical Guideline (upcoming)
Plastic waste		
Plastic waste generation (from MSW/industry sector)	Kt/year kg/person/day	Data from producers, data submitted to national authorities Data Examples: **Waste Wise Cities: WaCT Data Portal**

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KPI	Typical Units	Data source
Plastic waste		
Plastic waste composition in MSW	%	Waste Composition Surveys Data Examples: **Waste Wise Cities:** WaCT Data Portal **World Bank:** What a Waste database
Plastic packaging waste produced	Kt/year kg/person/day	National Authorities, Industry Compliance Schemes Data Example: **EUROSTAT:** EU Packaging Waste Data Set
Plastic waste collection	Kt/year Percentage of households receiving collection services (formal/informal collection services)	Data from MSW operators reporting to national authorities Data Examples: **Waste Wise Cities:** WaCT Data Portal **GPML:** Data Hub **GIZ:** Waste Flow Diagram (also for informal collection) National statistics
Recycled plastic quantities	Kt/year	Recycling plants reporting to National Authorities Data Example: **EUROSTAT:** EU Packaging Waste Data Set
Recovered plastic quantities (Waste-to-Energy)	Kt/year	Recovery plants reporting to National Authorities, Industry Compliance Schemes, data from producers
Plastic to land disposal (including open dumps)	Kt/year	Landfills reporting to national authorities

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KPI	Typical Units	Data source
Plastic waste		
Plastic waste exports and imports	Kt/year	Customs and Competent Authorities Data Source Example: **UNCTADstat: Spotlight on selected plastic trade trends**
Environmental plastic pollution		
Plastic emission/leakage into different fates, such as water, land, drains and burned	Kt plastic/year t/ person/year	Leakage assessment data and modulations Data Tool Examples: **GIZ: Waste Flow Diagram** **Earth Day: Plastic Pollution Calculator** **University of Leeds: SPOT Tool**
GHG emissions from plastic production	Mt CO^2-eq	National Statistical Agencies
Shoreline macro-litter	Beaches: Items/area (e.g. m^2) or items/transect (e.g. 100 m) Sediment: Items/surface area (e.g. m^2) or items/ mass of sediment (e.g. kg)	Visual surveys on defined stretches of coastline (e.g. 100 m) Sieving of sand/sediment samples Categorise items by material, use, and size Examples of Existing Guidelines: **GESAMP: Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean** **OSPAR-CEMP: Guidelines for marine monitoring and assessment of beach litter** **HELCOM: Guidelines for monitoring beach litter** Data Source Examples: **EMODnet: European Marine Litter Database** **AWI: Litterbase**

KPI	Typical Units	Data source
Environmental plastic pollution		
Water surfaces and columns	Floating Macro-Litter: Items/area (e.g. km^2) Micro-Litter: Items/area (e.g. km^2) or items/volume (e.g. m^3 or l)	Visual surveys from ships, Manta trawls, Bongo nets or other net and filter systems Examples of Existing Guidelines: **GESAMP: Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean** Data Source Examples: **AWI: Litterbase** **NOAA: Marine Microplastics Database**
Litter ingested by marine animals	Number of items per individual Mass per individual Mass by individual weight	Survey on the biota, sectioning of cadavers of animals which are commonly found in the area to guarantee supply of adequate samples Examples of Existing Guidelines: **GESAMP: Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean** **European Commission: Guidance on Monitoring of Marine Litter in European Seas** **OSPAR-CEMP: Guidelines for Monitoring and Assessment of marine litter ingested by sea turtles** Data Source Example: **AWI: Litterbase**

KPI	Typical Units	Data source
Environmental plastic pollution		
Individuals adversely affected by litter	No. of entangled individuals % of population affected Mortality Impaired physio-logical functions (e.g. metabolic rates, enzyme activity)	Visual surveys, stranding data, laboratory research Examples of Existing Guidelines: **GESAMP: Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean** **European Commission: Guidance on Monitoring of Marine Litter in European Seas**

Further Reading:

- → UNEP (2021): **Understanding the State of the Ocean: A Global Manual on Measuring SDG 14.1.1, SDG 14.2.1 and SDG 14.5.1**
- → UNEP (2022): **Practical guidance for the development of an inventories of plastic waste**
- → GIZ (2023): **Advances in remote sensing of plastic waste**
- → PREVENT Waste Alliance (2023): **Discussion Paper: Corporate Plastic Waste Disclosures: Towards a Universally Accepted Framework**
- → PREVENT Waste Alliance (2024): **Improved Litter Monitoring with Data Interoperability**
- → UNSW Sidney (2024): **Global Plastics Data Tracker**

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1 **Haarr, M. L., Pantalos, M., Hartviksen, M. K., & Gressetvold, M. (2020).** Citizen science data indicate a reduction in beach litter in the Lofoten archipelago in the Norwegian Sea. *Marine Pollution Bulletin,* 153, 111000. **https://doi.org/10.1016/j.marpolbul.2020.111000**

2 **GIZ. (2023).** Advances in remote sensing of plastic waste. **https://www.giz.de/de/downloads/giz-2023-en-advances-in-remote-sensing-of-plastic-waste.pdf**

3 **EU Joint Research Centre. (2025).** Marine litter on the EU coastline down by almost one-third. *European Commission.* **https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/marine-litter-eu-coastline-down-almost-one-third-2025-02-04_en**

4 **World Bank. (2021).** Marine Litter Baseline in Lebanon 2021 (English). **http://documents.worldbank.org/curated/en/099062323113010114**

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6 **Thiel, M., et al. (2023).** Citizen scientists study beach litter along 12,000 km of the East Pacific coast: A baseline for the International Plastic Treaty. *Marine Pollution Bulletin.* 196. 115481. **https://doi.org/10.1016/j.marpolbul.2023.115481**

7 **Bundesministerium für Bildung und Forschung (BMBF). (2019).** Plastikpiraten – Plastik in der Umwelt. **https://bmbf-plastik.de/sites/default/files/2019-05/Poster%20Plastikpiraten%20Plastik%20in%20der%20Umwelt%2004-04-19.pdf**

8 **European Commission, CINEA. (2024).** Plastic Pirates – Empowering Citizen Science to Tackle Plastic Pollution. **https://cinea.ec.europa.eu/featured-projects/plasticpirates-empowering-citizen-science-tackle-plastic-pollution_en**

9 **Ministério do Meio Ambiente. (2019).** Roteiro prático para organização de mutirões de limpeza de praias, rios e mangues. *Secretaria de Qualidade Ambiental, Departamento de Gestão Ambiental Territorial.* **https://www.gov.br/mma/pt-br/acesso-a-informacao/acoes-e-programas/programa-projetos-acoes-obras-atividades/agendaambientalurbana/combate-ao-lixo-no-mar/roteiro-pratico-mutiroes-de-limpeza-de-praias.pdf**

10 **Sustainable Seas Trust. (2023).** African Litter Monitoring Manual. 2nd Edition. **https://sst.org.za/wp-content/uploads/2023/11/African-Litter-Monitoring-Manual_2nd-Edition_FINAL.pdf**

11 **AUSMAP. (2024).** Australian Microplastic Assessment Project Impact Report 2024. **https://www.ausmap.org/_files/ugd/c61656_e19e61941ac94b9fa84ebec36f802b95.pdf?index=true**

Shifting from a linear to a circular plastics economy requires the redirection of financial flows and substantial investment in circular materials, infrastructure, and systems.[1] Current private investment in plastics circularity averages just $32 billion per year – well below the estimated $1 trillion needed annually to reduce mismanaged plastic waste by 90% by 2040.[2, 3] Although emerging economies are among the most affected by plastic pollution, they receive only 6% of global investment in circularity, underscoring the need for more targeted financial support.[4]

Implementing treaty commitments and national action plan measures will demand significant financial resources from both public and private sectors. Public finance allocation must be justified against competing national priorities, particularly in resource-constrained contexts. All stages of the plastic lifecycle require funding for capital investment, operations, and maintenance. Underfunding often results in inadequate infrastructure, weak service delivery, and poor environmental outcomes.

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This chapter focuses on public sector action and highlights measures that governments can take to mobilise and allocate financial resources. While private finance is addressed primarily in relation to public interventions – such as Extended Producer Responsibility (EPR), blended finance, or concessional finance – more detailed guidance on private capital (e.g. loans, equity) can be found in the two-part PREVENT Waste Alliance publication "Financing Circularity".

Although not a core focus of this Toolkit, international and bilateral funding sources exist and may support governments and stakeholders in designing and implementing plastic pollution measures.

PUBLIC FINANCE

Redirecting Subsidies from Linear to Circular Systems

The global plastics industry, particularly the production of primary plastic polymers, currently benefits from significant public subsidies, which are estimated at over $30 billion annually. These subsidies are delivered through various channels, including capital-related support (grants, concessional loans, loan guarantees), feedstock subsidies (e.g. tax credits, rebates, or exemptions), and energy-related incentives for production. Without such support, the cost of primary polymers is estimated to increase by 10%.[5]

To promote a transition to circular solutions, it is essential that these subsidies be systematically reviewed, removed where misaligned, and redirected toward circular plastics infrastructure, innovation, and systems.

Public Incentives for Circular Solutions

In addition to redirecting subsidies, governments can use a range of financial and regulatory instruments to stimulate circular innovation and investment. These may include:

- Preferential loan conditions or concessional financing for projects that contribute to reduction, recycling, or reuse.
- Circularity criteria in public procurement, requiring suppliers to meet minimum standards for recycled content, product durability, reparability, or take-back schemes. This can create stable demand for circular products and services.
- Tax incentives such as accelerated depreciation, reduced taxes, or tax credits for circular business models or investments in circular infrastructure.
- Inclusion in national green taxonomies, which helps define circular economy investments as eligible for green finance, facilitating access to both public and private capital.

Such targeted incentives support innovation, job creation, and long-term cost savings in the transition to a circular plastics economy.

PRIVATE SECTOR CONTRIBUTIONS ENABLED BY PUBLIC POLICY

Waste Management and Product-Specific Fees

Municipal waste management fees play a key role in funding waste system operations, including collection, recycling, and disposal. Fee structures can be adjusted to create incentives for households and businesses to reduce waste generation or improve waste sorting. Pay-As-You-Throw (PAYT) systems, for example, charge based on the volume or weight of waste generated. | see case 41

In addition, tourism-related municipal fees can help cover the seasonal surges in waste generation, earmarked specifically to address waste Product-specific levies, such as charges on PUAs and SUPs, can also be introduced. These can not only generate revenue waste management but also discourage the consumption of non-essential or problematic plastic items.

Extended Producer Responsibility (EPR) | see tool 5

EPR is a policy mechanism that shifts the responsibility for end-of-life product management from municipalities to producers. There are several forms of EPR:

- Financial EPR requires producers to cover waste management costs, typically by paying fees to Producer Responsibility Organisations (PROs). These fees are then transferred to municipalities to fund relevant services. It is important to note that these fees are not taxes as they directly fund operational costs.

- Operational EPR goes further, with PROs assuming responsibility not just for financing, but also for organising and delivering waste management services.

Furthermore, eco-modulated fees are often integrated into EPR systems to incentivise better product design. Products that are more recyclable or less harmful to the environment are subject to lower fees.

Successful implementation of EPR ultimately depends on a strong legal framework that defines roles, targets (e.g. for recycling or prevention), and enforcement mechanisms. Evidence shows that mandatory EPR schemes are generally more effective than voluntary ones due to stronger monitoring and reduced free riding by non-compliant producers.[6]

Deposit Refund Systems (DRS) | see case 10

As a specific form of EPR, DRS aim to improve collection rates of targeted products such as PET bottles. Consumers pay a deposit at the point of sale, which is refunded when the item is returned. These systems encourage reuse and recycling, reduce littering, and ensure high-quality material recovery. As with other EPR schemes, DRSs are financed by producers, typically through handling fees. However, operational costs may be offset by unclaimed deposits, cost savings from reusable containers, and revenues from selling high-quality recycled materials.[7]

Credit Schemes

Plastic credits are market-based instruments that represent a specific amount of plastic waste that has been collected, recycled, or otherwise responsibly managed. Companies, particularly in the fast-moving consumer goods sector, can purchase these credits to contribute to certified waste management projects. While plastic credits offer potential to mobilise private finance, they currently lack standardised definitions and are mostly voluntary and unregulated. Criticisms include concerns about transparency, additionality, and greenwashing.[8, 9, 10] Governments considering including plastic credits into policy instruments should establish clear rules for

their use and ensure that potential claims are credible, verifiable, and not undermine other regulatory obligations, such as EPR schemes and reduction targets.

Carbon credits offer established mechanisms for mobilising financial resources to support GHG reductions from MSW projects. Each carbon credit represents one tonne of carbon dioxide equivalent in reduced or avoided emissions. Although, most carbon credit projects in the MSW-sector focus mainly on methane mitigation from organic fractions of waste, general improvements of the waste collection and treatment sector can also have positive side effects on reducing environmental pollution from plastic waste. Furthermore, it is important to consider potential risks, such as claims about avoided upstream emissions that cannot be adequately verified or that are based on vague predictions scenarios, which could undermine the credibility and effectiveness of such certificate schemes.

Stakeholder consultations further underscore that results-based finance instruments, such as credit-based finance schemes, should be viewed primarily as short- to medium-term enablers, rather than long-term funding solutions.[11]

BLENDED FINANCE – BRIDGING PUBLIC AND PRIVATE CAPITAL

Circulate Capital: Mobilising Investment for Plastics Circularity

Blended and Concessional Finance Instruments |see case 11 | see case 13 | see tool 6

Mobilising private capital is essential to address the significant investment needs of plastic pollution prevention. Blended finance offers an effective approach by using public funds to attract private investment and direct capital towards priority areas aligned with public policy goals. Public contributions are typically structured to absorb part of the financial risk, thereby making investments more appealing to private actors through mechanisms such as co-financing, loan guarantees, or concessional terms.

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Public financial institutions, such as national development banks, can offer concessional loans, extended grace periods, and lower interest rates to targeted sectors. They may also provide financing to those without an established credit history. In some cases, default guarantees are issued to reduce risk for private investors, without directly subsidising them.

Blended finance helps unlock funding for proje ise be seen as too risky or unprofitable, especially in early-stage or underserved markets.

Climate Bonds Initiative – Waste Management Criteria

Thematic Bonds | see case 12 | see tool 7

Governments, financial institutions, municipalities, and corporations can issue thematic bonds, such as green bonds, blue bonds, or sustainability-linked bonds, to raise capital for clearly defined environmental objectives. These instruments can be used to finance plastic waste prevention, investment in circular infrastructure, development of recycling technologies, and promotion of reuse systems.

Green bonds are well-suited to support circular economy projects. They attract institutional and philanthropic capital by offering investors both financial returns and verifiable environmental benefits. Bond proceeds are earmarked for projects with measurable outcomes, thereby enhancing transparency and accountability. Green bonds also help governments and companies diversify funding sources and demonstrate commitment to sustainability targets.

By explicitly linking funding to performance indicators, green bonds can also improve project quality and encourage better planning and monitoring. Furthermore, issuing green bonds may reduce borrowing costs over time, especially as markets increasingly favour climate-aligned investments. In this way, thematic bonds not only unlock capital but also reinforce long-term structural shifts towards circular and low-carbon economies.

CASE 10 **DRS FOR BEVERAGE CONTAINERS, GERMANY**

Germany operates one of the most advanced DRS globally, comprising two distinct components: a reusable container system and a single-use deposit system. Both are supported either directly or indirectly by the German Packaging Act, which places responsibility on producers and distributors to ensure the collection and proper disposal of packaging waste, thereby promoting the development of operational EPR systems.

Many producers and distributors meet their obligations by using reusable glass or plastic beverage containers and participating in long-established, voluntary deposit systems. For single-use beverage containers the Act explicitly mandates participation in a nationwide deposit refund system.

Under the current regulatory framework:

- Deposits for refillable containers are not fixed by law but typically range from €0.08 to €0.15 per bottle and €1.50 per crate and are fully refundable upon return.
- Deposits for single-use beverage containers are legally set at €0.25, also refundable upon return.

Both systems are considered financially sustainable and serve as distinct forms of EPR. The reusable system supports long-term circularity by reducing material demand (containers may be reused up to 50 times) and by promoting standardised, pooled designs over custom packaging.[12] The mandatory single-use system, in contrast, generates a significant part of its revenue from unclaimed deposits and the sale of high-quality recyclates, supporting system viability without burdening public budgets.[13]

Germany's dual approach is widely regarded as a global benchmark, achieving return rates of up to 98% for eligible single-use beverage containers.[14] This high performance reflects the system's well-established infrastructure, strong legal backing, and consumer familiarity with deposit-based incentives.

CASE 11 **CIRCULATE CAPITAL: MOBILISING INVESTMENT FOR PLASTICS CIRCULARITY**

Circulate Capital is a venture capital firm dedicated to tackling the ocean plastic crisis by investing in circular economy solutions across low- and middle-income countries. The firm manages two key funds that mobilise both public and private capital to support scalable innovations in waste management and plastics circularity.

- **Circulate Capital Ocean Fund I**
  Launched in 2019, this $100+ million fund supports solutions to plastic waste and promotes circular economy models in South and Southeast Asia. It was established in partnership with leading multinational corporations, including PepsiCo, Danone, The Coca-Cola Company, Dow, and Unilever. To de-risk the fund and attract private investment, the United States International Development Finance Corporation, in partnership with USAID, provided a 50% default guarantee for loans, up to $35 million.
- **Circulate Capital Ocean Fund I-B (Disrupt)**
  Launched in 2023, this $60+ million fund targets early-stage, transformative technologies at the intersection of plastics and climate innovation in Latin America and the Caribbean. The Inter-American Development Bank serves as anchor investor with $4 million, while the European Investment Bank has committed $20 million, helping to crowd in additional private capital.

Selected Portfolio Investments

- Lucro Plastecycle (India): Developing post-consumer recycled flexible plastic packaging solutions.
- Recykal (India): Offering digital platforms that connect waste generators, processors, recyclers, and brand owners, improving transparency and efficiency across the value chain.

Circulate Capital's blended finance approach demonstrates how targeted public guarantees and anchor investments can unlock private capital and accelerate circular economy innovation in regions most affected by plastic pollution.

CASE 12 **CITY OF CAPE TOWN: PIONEERING MUNICIPAL GREEN BONDS IN AFRICA**

In 2017, the City of Cape Town became one of the first municipalities in Africa to issue a green bond, marking a significant step in local climate finance.[15] Certified by the Climate Bonds Initiative, this sub-sovereign bond enabled the city to diversify its funding sources and tap into a new class of investors focused on sustainable and climate-aligned investments.

The proceeds were earmarked for climate mitigation and adaptation projects, with a particular focus on upgrading water and wastewater infrastructure. Investments included improvements to municipal reservoirs and the installation of efficient pressure measurement systems to enhance water management.

The bond gained international recognition and was awarded Green Bond of the Year in 2018 by Environmental Finance and the Climate Bonds Initiative. It is widely regarded as a leading example of successful green bond issuance at the municipal level, showcasing how local governments can leverage capital markets to finance climate-resilient infrastructure.

CASE 13 **CARIBBEAN BIODIVERSITY FUND'S FACILITY FOR ADVANCING CIRCULAR ECONOMY – A BLENDED FINANCE VEHICLE**

The **Facility for Advancing Circular Economy** is the latest addition to the Caribbean Biodiversity Fund, specifically established to support marine litter management across Caribbean islands. The Facility was created as a sinking fund by KfW, acting on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

Adopting a circular economy approach, the facility funds initiatives by both public and private sector actors that aim to eliminate waste and pollution, keep materials in use, and restore natural ecosystems. The Caribbean Biodiversity Fund invites project proposals that apply practical circular economy principles to:

- Prevent or reduce waste from entering the marine environment, and
- Remove existing marine litter, with attention to proper post-collection handling and disposal.

Grants range from $400,000 to $2,000,000 per project, awarded through competitive calls for proposals. All projects must include co-financing ("matching") contributions, with required levels varying by applicant type. In addition to environmental impact, the financial viability of proposed activities is a key criterion in the grant evaluation process.

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TOOL 5 PREVENT WASTE ALLIANCE EPR TOOLBOX AND THE GLOBAL ACTION PARTNERSHIP FOR EPR

The PREVENT Waste Alliance **EPR Toolbox** is a practical and comprehensive resource designed to support stakeholders in the development and implementation of EPR systems for packaging. It provides hands-on guidance for setting up and operating EPR schemes, with a strong emphasis on defining roles and responsibilities within a clear legal and regulatory framework.

Key components include detailed insights on:

- Establishing and managing PROs
- Structuring and managing financial flows
- Designing effective regulatory frameworks to ensure robust collection and sorting systems
- Integrating the informal sector to promote inclusive waste management and ensure a just transition

The toolbox is complemented by practical case studies, a set of frequently asked questions, informative videos, and concise factsheets, making it suitable for a wide range of users. This toolbox is part of the broader efforts under the Global Action Partnership for EPR, an international initiative jointly established by GIZ, OECD, UNEP, and WWF and hosted by the PREVENT Waste Alliance. The partnership receives strategic support from the Ellen MacArthur Foundation to promote circular economy principles.

GAP for EPR further offers:

- A helpdesk providing tailored technical assistance to governments through peer exchanges and advisory services
- An active community of practice, enabling stakeholders to connect, exchange knowledge, and share best practices on EPR implementation

Together, these tools and services foster international cooperation and capacity-building for effective EPR policy development.

Link:

- **PREVENT Waste Alliance: EPR Toolbox**
- **Global Action Partnership for EPR: EPR Helpdesk**

TOOL 6 **THE PLASTICS CIRCULARITY INVESTMENT TRACKER – MAPPING PRIVATE CAPITAL FLOWS**

The Plastics Circularity Investment Tracker, developed by The Circulate Initiative in partnership with the International Finance Corporation, monitors private-sector investments in plastics circularity globally from 2018 to 2023. It captures financial flows across the full plastics value chain – from upstream innovations to downstream solutions.

Copied from **https://www.thecirculateinitiative.org**

Tracked investment areas include:

- Materials innovation
- Product redesign and reuse/refill models
- Service infrastructure
- Operational platforms and digital tools
- Collection, recovery, and recycling technologies

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By mapping where capital is already deployed, the Tracker provides governments and policymakers with a clearer picture of investment patterns and financing gaps. It serves as a strategic tool to:

- Identify barriers to circular economy financing
- Inform policy and financial planning
- Support the design of blended finance strategies to attract private capital

As such, the Tracker is a valuable entry point for creating enabling conditions to scale circular solutions and direct investments where they are most needed.

Link:

- The Circulate Initiative: Plastics Circularity Investment Tracker

TOOL 7 CLIMATE BONDS INITIATIVE – WASTE MANAGEMENT CRITERIA

Investor interest in green and climate bonds continues to rise, alongside the demand for credible and transparent labelling. To enhance comparability and mobilise private capital for closing the waste management financing gap, the Climate Bonds Initiative has developed climate mitigation and adaptation criteria for the waste management sector, aligned with the goals of the Paris Agreement. The most recent version of these criteria was launched in 2022, and assets or projects meeting the requirements are eligible for certification under the Climate Bonds Standard.

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The criteria apply to projects and assets involved in the treatment of municipal solid waste and include specific measures for plastic waste management, such as:

- Collection infrastructure, including bins, containers, and logistics systems
- Sorting systems to separate recyclables
- Reuse and recycling, including repair operations and processing into secondary raw materials
- Thermal treatment with energy recovery for residual waste (permitted outside the EU only)

These standards aim to strengthen market integrity, provide assurance to investors, and support the scaling of climate-resilient and circular waste systems.

Link:

- **Climate Bonds Initiative: Waste Management Criteria**

Further Reading:

- → OECD (2021): **The OECD DAC Blended Finance Guidance**
- → Circle Economy (2025): **The circularity gap report finance**
- → PREVENT Waste Alliance (2024): **Guidelines on Minimum Requirements for Plastic Waste Recovery & Crediting Standards.**
- → PREVENT Waste Alliance (2025): **Financing Circularity Part 1 Bridging the Gap between Finance Demand and Supply**
- → PREVENT Waste Alliance (2025): **Financing Circularity Part 2 Guidance to Unlock Finance for Circular Economy Actors**

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- UNEP (2024): Ad hoc Intersessional Open-Ended Expert Group on Finance: Co-Chairs Synthesis Paper
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The principle of a Just Transition emphasises the need to ensure that measures aiming to green the economy are implemented in a way that is as fair and inclusive as possible to everyone concerned. This means creating decent work opportunities and leaving no one behind.[1] While circular and socially responsible business models offer significant environmental, economic and social benefits, their widespread implementation often requires public support.[2] Just Transition processes aim to ensure sectoral diversification, decent working conditions, and livelihood security for affected individuals and businesses.[3]

Marginalised groups – including women, youth, informal workers and waste pickers, must be at the centre of these efforts. Globally, an estimated 15 to 40 million people work in informal recycling and waste picking.[4, 5] In many regions where formal waste systems are absent or ineffective, informal workers recover up to 60 % of waste materials.[6] They make a vital contribution by reintegrating lost resources into the economy,[7] yet remain largely invisible in policy frameworks and are often stigmatised or excluded from formal waste systems.

Many informal waste pickers face unsafe and undignified working conditions. They are exposed to discrimination, physical danger, and social exclusion, and often live near or on dumpsites with limited access to water, sanitation or healthcare. Some earn less than $2 per day and live below the extreme poverty threshold.[8] As new opportunities emerge through national and global measures to prevent plastic pollution, these groups must be included to ensure fair and equitable outcomes.

The gender dimension is particularly significant. Women make up roughly 37 % of the global informal waste workforce,[9] but often face greater obstacles in accessing jobs or securing income during transitions to formal systems. They are more likely to bear unpaid domestic responsibilities and are often limited to low-value, labour-intensive, and more hazardous recycling tasks. Children are also commonly engaged in informal waste collection. Their involvement in waste picking instead of education perpetuates cycles of poverty and restricts opportunities for future generation.

This toolkit highlights practical measures for governments, businesses and civil society to support a Just Transition across the plastics value chain. Particular attention is placed on recognising and including informal workers and waste pickers, ensuring their participation in shaping policies and securing fair and decent work as part of the circular economy transition.

ECONOMIC AND TECHNICAL SUPPORT MEASURES | see case 14 | see tool 8

Economic and technical support measures for businesses and workers are essential to ensure broad acceptance of the transition from linear to circular economic models. Such support can take many forms, including business diversification and workforce reorientation, as well as adjustments in public finance. Redirecting subsidies and adapting funding criteria to favour circular investments are particularly effective tools. In parallel, circular and social enterprises often stand to benefit directly from regulatory measures such as product bans, standards, certifications, and economic incentives aligned with their business models.

FORMAL INTEGRATION AND LEGAL RECOGNITION OF INFORMAL WORKERS | see case 17 | see tool 9 | see tool 11

Establishing legal rights for informal workers and waste pickers, and integrating them into formal systems, is essential to recognise them as legitimate stakeholders in the waste sector. Their meaningful involvement in the planning, design, and decision-making processes for waste management services and infrastructure is key to achieving socially equitable outcomes. The concerns and needs of vulnerable groups and particularly informal workers must be addressed from the outset. Local governments play a vital role by identifying and registering waste pickers within their jurisdictions, issuing official documentation such as identification cards to enable their legal access to recyclable materials and formal markets. At the same time, public regulations like health and safety standards for waste handling must be upheld to ensure safe working conditions for all involved.

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REGISTRATION SYSTEMS AND INCENTIVES | see case 15 | see case 16

Creating registration systems can formalise the role of waste pickers within the plastics value chain. However, many informal workers face barriers such as low literacy, irregular migration status, or mistrust in formal institutions. Involving waste pickers in the design of these systems is key. Incentives such as better access to recyclable materials, eligibility for EPR payments, or access to training and health services, can help increase participation.

PUBLIC-PRIVATE AGREEMENTS AND SOCIAL PROTECTIONS

Service agreements or memoranda of understanding between municipal authorities and waste picker organisations can improve access to underserved communities and help professionalise waste services. These agreements can also secure social protections, healthcare access, and commitments to eliminate child labour. Such collaborations support upward mobility and greater legitimacy for informal workers.

FAIR PAY AND INCLUSIVE EPR/DRS SCHEMES

National standards for fair pay and social protection, when implemented at the local level, can improve working conditions for vulnerable groups like waste pickers. Well-designed EPR and DRS system | see case 18 can also serve as instruments for integrating informal workers into the plastics value chain, ensuring equitable remuneration and formal recognition of their role.[10]

STRENGTHENING ORGANISATIONS AND LOCAL PARTNERSHIPS

Self-organisation of waste pickers into associations or cooperatives can be actively supported by governments. These entities can serve as intermediaries with local authorities, manage service delivery, and ensure compliance with health, safety, and labour standards. Partnering with such organisations can also facilitate outsourcing of municipal waste services to community-based enterprises.

TARGETED SUPPORT AND CAPACITY BUILDING | see tool 10

Support measures can also include capacity building through training and legal assistance, especially for women and underrepresented groups who face additional barriers in accessing formal employment. Supporting the development of cooperatives, small- and micro-enterprises contributes to environmentally sound waste management while enhancing dignity and resilience in the sector. Furthermore, businesses and workers can be supported in their diversification and reorientation.

CASE 14 MOROCCO'S PLASTIC BAG BAN: SUPPORTING INDUSTRY TRANSITION AND LESSONS LEARNED

In 2016, Morocco enacted the "Zero Mika" law, banning the production, import, export, sale, and distribution of most plastic bags. Recognising the need to support affected businesses, the government established a transition fund of approximately €18 million, financed through a tax on plastic goods. The fund aimed to assist manufacturers in shifting to sustainable alternatives. As a result, 25 companies successfully converted their operations, and 19 new businesses focused on alternative products were launched – together creating over 2,600 new jobs in the alternative bag sector. Today, around 250 companies produce reusable bags and containers.[11]

Despite these achievements, the ban faced criticism due to limited industry consultation, a short implementation timeline, and insufficient consumer outreach. These shortcomings led to weak enforcement, particularly in informal markets, and minimal behavioural change. Key lessons from Morocco's experience underscore the importance of inclusive planning, extended transition periods, sustained public awareness campaigns, and strong enforcement mechanisms to ensure long-term success.[12]

CASE 15 WASTE PICKER INTEGRATION GUIDELINES AND REGISTRATION SYSTEM IN SOUTH AFRICA

In South Africa, over 60,000 waste pickers – also referred to as reclaimers – perform critical environmental and economic services by salvaging and sorting recyclables. Despite their contributions, they have historically faced marginalisation, harassment, and exclusion from formal waste management systems.

To address these challenges, the **South African Department of Environment, Forestry and Fisheries** issued the **Waste Picker Integration Guideline** in 2020, including a 7-step process for waste picker integration. | see tool 11 This landmark policy was developed through a participatory, multi-stakeholder process that included waste picker organisations like the African Reclaimers Organisation and the South African Waste Pickers Association.

The guideline emphasized waste picker recognition, integration into formal waste systems, and access to fair compensation under the extended EPR framework.

The COVID-19 pandemic intensified the urgency for a centralised system to reach waste pickers with aid, revealing the shortcomings of past manual, exclusionary registration efforts. As a response, the South Africa Waste Picker Registration System (SAWPRS) was conceived with the help of existing waste picker organisations.

The SAWPRS is an online platform designed to officially register waste pickers who present a valid identification document – regardless of their nationality. Once registered and verified, waste pickers receive SAWPRS ID cards that enhance their recognition, enable access to recyclables, and qualify them for compensation under EPR laws. During its rollout (2021 – 2022), nearly 7,134 waste pickers were registered and verified.

These steps have been instrumental in furthering a just transition for waste pickers in South Africa. By formally recognizing waste pickers and integrating them into national and municipal systems, the SAWPRS challenges systemic exclusion and elevates informal workers' status. The linkage to EPR ensures pickers are compensated for environmental services, contributing to fairer livelihoods and economic resilience. Additionally, the project served as a significant opportunity for capacity building for waste pickers organisations who were central to the SAWPRS design and rollout. Both the African Reclaimers Organisation and the South African Waste Pickers Association received training in campaign management, digital registration, and negotiation for strengthening their long-term organisational capacity.[13]

CASE 16 **INCENTIVISING COASTAL CLEAN-UP THROUGH WASTE VALORISATION AND DIGITAL INCLUSION IN MOZAMBIQUE**

The Blue Credits project, developed by the Mozambican Association for Recycling, is a funding model for coastal pollution clean-up. It assigns or increases the economic value of collected waste and recyclables, offering direct financial incentives for their recovery. Private companies and other stakeholders can support the initiative by purchasing Blue Credits, with a contribution of approximately € 228 funding the removal of one tonne of waste. This approach not only supports environmental goals but also generates measurable social impact.

The project uses the **KOLEKT app** to register waste flows and individual waste pickers. Designed for both basic and smartphones, the app links each user's phone number to their name, ensuring transparency and accountability. Only registered users receive payments, creating a strong incentive for informal waste pickers to register. In doing so, the app serves as a simple yet effective mechanism to formally recognise waste pickers in Mozambique, ensuring their contributions are recorded and valued.[14]

CASE 17 **INCLUSION AND FAIR PAYMENT OF WASTE PICKERS IN BOGOTA, COLOMBIA**

The recognition and inclusion of waste workers in Bogota, Colombia was achieved through a long and arduous process of advocacy and legal action led by the Recycler Association of Bogota (ARB), the city's waste pickers' association. Before this process, waste pickers in Bogota, many of whom were economic migrants or displaced people, faced discrimination, abuse, and even violence in their work. The city's waste management model was focused on landfilling and privatised collection services, completely excluding the informal recycling sector.[15]

The ARB, through strategic legal action and advocacy, was able to transform the perception of waste pickers and secure their recognition as legitimate public service providers in waste management. Key milestones in this process included:

- Since 2003, a series of rulings by Colombia's Constitutional Court upheld the rights of waste pickers and compelled the municipal authorities to adopt affirmative measures to support their participation in waste management.
- In 2012, Decree 564 formally acknowledged waste pickers as providers of services such as waste collection, transport, and recycling. The decree also introduced a payment mechanism to compensate them for their environmental contributions.
- In 2013, the city implemented a system for remunerating waste pickers. By 2014, this scheme had reached 2,300 of the approximately 14,000 waste pickers operating in Bogotá.

The ARB's advocacy efforts were crucial in driving a paradigm shift, leveraging the Colombian constitution's emphasis on protecting basic human rights, including the right to work. The organisation built strategic alliances with the Constitutional Court, other civil society groups, and even some actors in the recycling industry. The process has, however, not been without challenges. Informal recyclers continue to face resistance as involvement of large companies is often favoured during privatisation. Ongoing efforts are needed to ensure the sustainability of the recognition and payment system, as well as to address other issues such as fluctuation in the market prices for recovered materials.[16]

CASE 18

FORMAL INCLUSION OF WASTE PICKERS IN EPR SYSTEMS: LESSONS FROM CHILE AND BRAZIL

Chile's EPR law, enacted in 2016, was one of the first globally to formally integrate informal waste pickers into a regulated EPR system. The law requires waste pickers to be certified and registered, granting them formal recognition as service providers. Certified waste pickers receive preferential access to contracts for collection and sorting, ensuring their participation in municipal tenders and Producer Responsibility Organisations.[17]

Despite this progress, challenges remain in securing fair remuneration, providing training and financial support, and ensuring transparency in scheme implementation. Waste pickers continue to demand a more inclusive role in EPR development and monitoring.[18]

Brazil's 2010 National Solid Waste Policy similarly emphasises the formal integration of waste pickers and a shared responsibility model for packaging waste. A sectoral agreement with packaging companies in 2015 set landfill diversion targets and prioritised cooperatives in waste collection, drop-off centres, and processing systems. It also introduced support measures such as training, equipment provision, awareness campaigns, and guaranteed recyclables purchasing.[19]

While the agreement strengthened many cooperatives, challenges persist, particularly for unaffiliated pickers, who often lack support. Waste picker organisations also point to ongoing inequities in decision-making power and compensation between cooperatives and private companies.[20, 21]

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TOOL 8 ENABLING JUST AND INCLUSIVE CIRCULAR TRANSITIONS - RECOMMENDATIONS FOR BUSINESS, FINANCE, AND POLICY

A report by Yunus Environment Hub and the Bertelsmann Stiftung from 2025 examines how circular social businesses can act as key enablers of a sustainable and inclusive circular economy. While the recommendations are tailored to **Germany's new National Circular Economy Strategy**, they offer broader guidance for advancing just and systemic circular transitions in other contexts as well. The report outlines targeted actions for businesses, investors, and policymakers to help create an enabling environment for circular solutions that deliver both environmental and social value.

Recommendations for Circular Businesses

Circular businesses are encouraged to embed at least three of five systemic impact principles into their models:

- Tackling root causes by addressing the structural drivers of environmental harm, inequality, and exclusion.
- Driving behavioural change through inclusive communication, education, or product design that supports more sustainable choices.
- Enabling accessibility by ensuring that circular solutions are affordable and relevant to diverse social groups and regions.
- Fostering collaboration through partnerships across sectors, regions, and stakeholder groups; and
- Ensuring transparency by openly communicating goals, outcomes, and challenges.

To maintain their mission focus, businesses should establish and regularly update a clearly defined social and environmental mission that is fully embedded in their operations. They are also encouraged to communicate their impact openly and honestly, including challenges and limitations, to strengthen trust and attract like-minded investors and collaborators.

Recommendations for Investors and Funders

The report calls on investors to adopt funding models that support long-term impact, moving beyond conventional, exit-driven mechanisms. Investment decisions should integrate social impact alongside environmental and economic factors to foster truly holistic sustainability. Moreover, funding instruments should include a strong regional dimension, targeting initiatives in rural or underserved areas, where scalable and replicable business models are often overlooked but urgently needed.

Recommendations for Policymakers

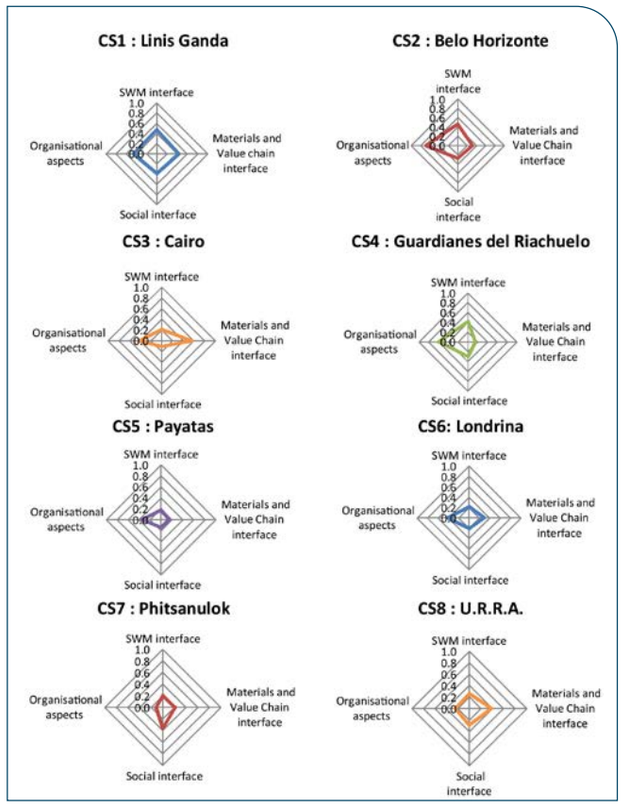
Policymakers are urged to recognise the social dimension as a strategic pillar of circular economy policy. This includes setting measurable targets for inclusion and social innovation and supporting them through tailored funding and infrastructure. Public funding criteria should explicitly reward social value creation, making these contributions more visible and viable. Public procurement processes should also prioritise circularity and social impact by embedding these criteria into tendering and award procedures, helping to create stable demand for circular social enterprises and level the playing field for mission-driven actors.

Link:

- Yunus Environment Hub & Bertelsmann Stiftung: **A Systemic Circular Economy Transition in Germany**

TOOL 9 INTERA FRAMEWORK: GUIDING INCLUSIVE WASTE AND RESOURCE MANAGEMENT

The University of Leeds developed the Integration Radar (InteRa) framework to support the integration of the informal recycling sector into formal waste and resource management systems, particularly in low- and middle-income countries. InteRa offers a structured tool to assess existing interventions and guide the design of inclusive strategies that acknowledge the vital role of informal waste workers.



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At its core, InteRa uses a radar diagram to visualise the scope and balance of integration efforts across four key interfaces:

- Solid Waste Management (SWM) Interface – Focuses on physical aspects such as waste collection, transportation, and disposal.
- Materials and Value Chain Interface – Assesses how waste is processed, transformed, and reintegrated as secondary raw materials.
- Social Interface – Addresses the socio-economic conditions, rights, and well-being of waste pickers.
- Organisational Aspects – Examines governance structures, policies, institutional roles, and regulatory frameworks.

By evaluating each interface, InteRa helps identify strengths and gaps in current integration efforts. Case study applications have shown that the tool is effective in assessing both the depth and breadth of interventions, offering valuable insights for improving the inclusion of informal recyclers in circular economy strategies.

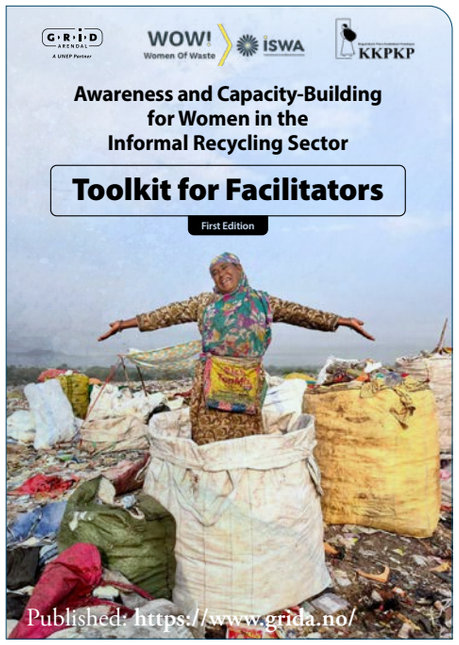
Link:

- University of Leeds: **InteRa Tool**

TOOL 10 **AWARENESS AND CAPACITY-BUILDING FOR WOMEN OF THE INFORMAL RECYCLING SECTOR TOOLKIT FOR FACILITATORS**

GRID-Arendal, in collaboration with strategic partners, has developed a geographically tailored capacity-building Toolkit to facilitate a Just Transition for women in the informal recycling sector, providing opportunities for awareness, empowerment, and capacity enhancement. The Toolkit includes the following guidance and materials.

- Form Circles: Create teams or groups where women in the informal recycling sector can connect, collaborate, and build community.
- Facilitate Activities: Conduct sessions using eight adaptable modules that cater to different geographic, developmental, and interest-based needs, ensuring the Toolkit's relevance across diverse settings.
- Ensure Engagement and Leadership: Apply facilitation methods that keep participants safe, active, and engaged while encouraging them to take on leadership roles.



The resource is designed for organisations and individuals working with women in the informal recycling sector, including waste pickers' associations, NGOs, universities, initiatives, and professional trainers.

Link:

- GRID Arendal: **Awareness and Capacity-building for Women of the Informal Recycling Sector: Toolkit for Facilitators**

TOOL 11 **SOUTH AFRICA'S 7-STEP APPROACH TO WASTE PICKER INTEGRATION**

With the launch of the Waste Picker Integration Guideline, South Africa introduced a structured 7-step process to support municipalities and industry in working collaboratively with waste pickers toward formal integration. Building on this foundation, the Reclaim, Revalue, Reframe training programme strengthened the integration process by providing targeted training, running public awareness campaigns, supporting the pilot rollout of the South African Waste Picker Registration System (SAWPRS), and publishing a set of factsheets for each step in the process.

The seven steps outlined in the guideline are:

1. **Prepare:** Build internal understanding and commitment to integrate waste pickers.
2. **Partner:** Engage and form collaborative relationships with waste pickers and stakeholders.
3. **Plan:** Develop a clear, participatory integration plan with goals and responsibilities
4. **Enable:** Create supportive policies, provide resources, and educate staff and communities
5. **Institutionalise:** Embed integration into official plans, budgets, and performance measures.
6. **Implement:** Carry out the integration plan and monitor progress.
7. **Revise:** Review and update plans and policies based on lessons learned and outcomes.

Link:

- Reclaim, Revalue, Reframe Training Programme: **7 Steps for Waste Picker Integration**

Further Reading:

- PREVENT Waste Alliance (2023): EPR Toolbox Factsheet 08: How can the informal sector get involved in the system?
- UN-Habitat (2023): Leaving no one behind
- EEA (2025): A Just Transition to Circular Economy Exploring current and potential social implications exemplary for the value chains batteries, plastics, and textiles
- ILO (2015): Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204) Workers' Guide
- GIZ (2011): Recovering resources, creating opportunities: Integrating the informal sector into solid waste management
- GIZ (2024): Towards a Sustainable Future: Recommendations for a Just Transition in Waste Management and Circular Economy in the ASEAN Region
- GIZ (2025): Gender in focus: Towards inclusive solutions to plastic pollution
- GIZ (n.d.): Workstream: Collect, systematise and promote the exchange of knowledge and experiences in circular economy to promote transformative processes driven by women (Spanish)
- Yunus Environment Hub, GIZ, IUCN and IUCN WCEL (2024): Just transition and inclusion: overcoming socio-economic barriers and driving a circular transition for a global plastics treaty
- GRID Arendal (2022): A Seat at the Table – The Role of the Informal Recycling Sector in Plastic Pollution Reduction, and Recommended Policy Changes
- WIEGO (2023): A Just Transition for Workers in Informal Employment.pdf
- International Alliance of Waste Pickers (2023): IAWP's Vision for a Just Transition for Waste Pickers under the UN Plastics Treaty
- EIONET (2025): A Just Transition to Circular Economy

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8 Morais, J., Corder, G., Golev, A., Lawson, L., & Ali, S. (2022). Global review of human waste-picking and its contribution to poverty alleviation and a circular economy. Environmental Research Letters, 17(6), 063002. **https://doi.org/10.1088/1748-9326/ac6b49**


a1 NATIONAL PLANS


a2 BASELINING AND MONITORING


a3 FINANCING


a4 JUST TRANSITION

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b

Addressing Plastic Production

Chemicals and polymers of concern refer to polymers or chemical additives that are associated with potential environment and health risks. These substances may exhibit hazardous properties such as toxicity, mutagenicity, endocrine disruption, environmental persistence, or bioaccumulation. Their presence in plastic products raises serious concerns for ecosystems, wildlife, and public health.[1]

Most chemicals of concern are additives intentionally used to enhance plastic properties such as flexibility, durability, colour, or UV resistance. However, risks also arise from non-intentionally added substances, which are chemical residues or by-products that enter the plastics value chain during manufacturing, use, or recycling. These can result in plastic products containing unknown chemical mixtures and concentrations, complicating risk assessment and safety controls.[2]

Substantial evidence has shown that problematic chemical additives can negatively affect human health and the environment, e.g. reproductive disruption, metabolic diseases, and cancer.[3] These substances are often found in everyday items, including food contact materials (FCMs) like water bottles, food containers, and the linings of canned goods.

The plastic production process involves a wide variety of chemical substances, many of which are known to be hazardous, while others lack adequate toxicity data. Transparency across the plastic lifecycle, from production to end-of-life, is essential to identifying and mitigating risks. However, information about the identity, chemical composition, or potential toxicity of these substances is often unavailable. In many countries, plastic manufacturers are not required to disclose this information, limiting public and regulatory oversight.[4]

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The PlastChem Report from 2024 identified more than 16,000 chemicals potentially used in plastic production across diverse sectors. Of these, only 1% are currently considered safe. At least 4,200 chemicals (26 %) are classified as hazardous, and approximately 1,200 (7 %) are considered less hazardous. Alarmingly, 66 % of these substances lack sufficient hazard data.[5] Despite the scale of use, only 128 chemicals are currently regulated under international multilateral environmental agreements such as the Basel, Rotterdam, and Stockholm Conventions,[6] and just 960 substances are subject to national or regional restrictions.[7]

Beyond health and environmental concerns, chemicals of concern can also present a significant barrier to circularity. Plastics containing hazardous substances can contaminate the resulting materials, reintroducing dangerous chemicals into new products.[8, 9] Certain chemicals can also damage recycling infrastructure or result in the generation of hazardous waste, particularly during chemical or solvent-based recycling processes.[10, 11]

REGULATORY MEASURES | see case 19 | see case 20 | see tool 12 | see tool 13 | see tool 14

Bans and Restrictions | see case 21

Regulations can limit or prohibit the manufacture, import, use, or sale of specific hazardous chemicals or polymers. These restrictions should be based on the latest scientific evidence and regularly updated as new information emerges. Where safer alternatives exist, stricter controls can be applied. Transition periods and exemptions may be considered when suitable alternatives are unavailable.

Products containing banned substances produced before the ban may remain in circulation; these "legacy substances" should be prevented from entering recycling streams to avoid reintroducing hazards into the circular economy.[12]

Permissible Concentration Limits | see case 22

Regulations can set concentration thresholds for chemicals in different products and sectors. For example, FCMs typically have stricter limits, with overall and specific migration limits defined to ensure safety.

Eco-Design Standards | see case 23

Eco-design requirements aim to improve product safety, reusability, and recyclability by restricting harmful substances and mandating simpler, safer material compositions. Reducing chemical complexity is critical for effective plastic waste management and achieving a non-toxic circular economy.[13]

Transparency and Disclosure

Increasing transparency through mandatory reporting of chemical substances in plastics is essential. Legal frameworks can require manufacturers and suppliers to disclose substances of concern in a centralised database, applying a "no data, no market" principle like the EU's REACH | see case 20 regulation. Transparency

throughout the value chain, including clear labelling, fluorescent tracers, or bar codes, facilitates proper separation during recycling, reducing contamination and enhancing recycled material quality.[14]

Monitoring and Permitting

Mandatory monitoring of chemicals in recycled materials ensures safety by detecting additives and non-intentionally added substances across the plastic lifecycle. Permitting schemes can regulate chemical use and concentration limits in production, recycling, and waste management, and promote adoption of best available technologies.

COLLABORATION AND VOLUNTARY AGREEMENTS | see case 24

Collaborative platforms and innovation ecosystems foster cross-sector cooperation essential to managing chemicals of concern. By linking academia, industry, and government, these ecosystems accelerate development of safer alternatives and align innovation with environmental and health policy goals.

AWARENESS AND BEHAVIOUR CHANGE

Stakeholder consultations, capacity-building workshops, seminars, and online support tools are vital to ensure industry compliance with new regulations, including safe product labelling and substance reporting. Educating consumers about chemical risks encourages demand for safer alternatives. Clear, comprehensible labelling is critical; without it, transparency efforts may fail. Effective communication strategies should be reinforced through educational programs, targeted media campaigns, and broad public outreach via social media and community channels.

CASE 19

INTERNATIONAL FRAMEWORKS FOR REGULATING CHEMICALS OF CONCERN

Several multilateral environmental agreements (MEAs) regulate known chemicals of concern. These include the Basel Convention (hazardous waste trade), Rotterdam Convention (trade of harmful chemicals), Stockholm Convention (Persistent Organic Pollutants, POPs), Minamata Convention (mercury), and the Montreal Protocol (halogenated substances). For example, the Stockholm Convention mandates controls and phased reductions of POPs such as polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecane (HBCD), which are commonly found in plastics.

Building on these, the newly adopted **Global Framework for Chemicals (GFC)** expands the scope by addressing the entire chemical lifecycle. It aligns with existing MEAs and sets five objectives with 28 sub-targets. Notable connections are in the field of transparency and data availability regarding chemicals in products, including those found in plastics (Target B1, B2, B3), as well as fostering industry action and the promotion of safer alternatives and sustainable approaches throughout the life cycle (Target D1, D2, D4). By incentivising innovation in safer alternatives and resource-efficient production, the GFC provides a critical linkage for achieving potential measures on chemicals of concern in the Plastics Treaty.

However, current MEAs cover only about 6 % of all known chemicals in plastics, leaving approximately 3,600 hazardous chemicals unregulated.[15] Some MEAs, like the Basel and Rotterdam Conventions, regulate only specific lifecycle stages, such as transboundary movement through prior informed consent. To maximise effectiveness, coordination is essential to avoid overlap and ensure mutual reinforcement among these agreements rather than duplication.

CASE 20

EU REACH REGULATION LIMITING CHEMICAL USE

The **REACH Regulation (EC 1907/2006)** is a key EU regulation for protecting human health and the environment from harmful chemicals, taking into account whether safer alternatives are available. REACH stands for **R**egistration, **E**valuation, **A**uthorisation and **R**estriction of **C**hemicals. Its main functions lie in the registration and evaluation of both new and existing chemicals, and in imposing restrictions or bans on hazardous substances.

The following are key components of the EU-REACH regulation:

Article 5 – No Data, No Market

Article 5 of REACH mandates that any chemical substance used in products and manufactured or imported in quantities of ≥1 tonne per year must be registered with the European Chemicals Agency (ECHA). As part of the registration process, a chemical safety assessment is required for substances exceeding 10 tonnes per year. This evaluation includes assessing potential risks to human health and the environment and requires submission of a Chemical Safety Report. The safety assessment helps define exposure scenarios and risk management measures.

The Candidate List

The EU REACH candidate list identifies substances of very high concern (SVHCs) that may be harmful to human health or the environment, such as carcinogens or persistent chemicals. Producers and importers must notify ECHA if a Candidate List substance is present in their articles above 0.1 weight-% and if the substance is present in these relevant articles in quantities totalling over one tonne per year, unless exposure can be excluded, or the substance has already been registered for that use.

Annex XIV – The Authorisation List

Annex XIV of REACH includes SVHCs, which are identified as having serious and often irreversible effects on human health or the environment, such as being carcinogenic, mutagenic, toxic for reproduction, persistent,

bioaccumulative, or of equivalent concern. Products which exceed SVHC concentrations of 0.1 weight-% require authorisation before they can be used or placed on the market. Companies must apply for authorisation via the SCIP (Substances of Concern In articles as such or in complex objects (Products)) | see tool 12 Database and demonstrate either that risks are adequately controlled or that the socio-economic benefits outweigh risks and that no suitable alternatives exist.

Annex XVII – The Restriction List

Annex XVII includes substances that are banned or restricted in specific uses due to their risks to human health or the environment. Unlike Annex XIV, which permits use under authorization, Annex XVII imposes direct restrictions. These may apply broadly or be limited to certain products – for example, phthalates in toys or poly-cyclic aromatic hydrocarbons (PAHs) in rubber materials.

Annex XV – Preparation of Proposals

Annex XV of REACH sets the framework for preparing proposals to regulate hazardous substances. It is used by ECHA or EU Member States to draft dossiers that propose a substance for SVHC identification (Candidate List), Authorization (Annex XIV), or Restriction (Annex XVII). These dossiers must provide scientific evidence on the risks posed by the substance and justify why regulatory action is necessary.

A restriction process can be initiated by an EU member state, ECHA, or the European Commission itself. The procedure can be triggered where they have concerns that a particular substance poses an unacceptably high risk to human health or the environment.

Introduction

a Setting the Framework

b Addressing Plastic Production

c Rethinking Design and Use of Plastic Products

d End-of-Life Management

b1 CHEMICALS AND POLYMERS OF CONCERN

b2 PROBLEMATIC, UNNECESSARY AND AVOIDABLE PLASTICS

↳ b1.1 INTRODUCTION ↳ b1.2 MEASURES **b1.3 CASES** ↳ b1.4 TOOLS ↳ b1.5 REFERENCES

Listing Process under EU-REACH:

Process	Steps
I Phase	Preparation and submission of restriction proposal
II-A Phase	Consultations
II-B Phase	Opinion Development
III Phase	Decision and follow up

Source: European Chemicals Agency, https://echa.europa.eu/restriction-process – ECHA accepts no responsibility and/or liability for any use made of the information, documents or data

CASE 21

EU BAN ON BISPHENOL-A (BPA) IN FCMs

In 2024, the EU issued **Regulation 2024/3190** which prohibits BPA and its salts in the manufacture of FCMs, including plastics, adhesives, coatings, and printing inks. This ban comes in response to extensive scientific evidence showing that BPA poses significant risks to human health, particularly to the immune, reproductive, developmental, and metabolic systems. The regulation updates and replaces previous regulations, including the 2018 ban on BPA in polycarbonate baby bottles, and mandates a phase-out period of 18 months for most products, giving industries time to transition to safer alternatives. Limited exceptions with stringent migration limits will be allowed where no viable alternatives currently exist.

The ban also demonstrates a close relation to the EU REACH regulation, under which BPA has been listed on the SVHC Candidate List since 2017. This listing obliges importers and manufacturers to notify ECHA via the SCIP Database if their products contain BPA above 0.1 weight-%. Additionally, BPA was added to Annex XVII restricting its concentration in thermal paper to 0.02 weight-% and sector-specific regulations for BPA in FCM came in place through the previously mentioned separate regulations.

CASE 22

FOOD CONTACT MATERIAL REGULATION IN INDONESIA

Indonesian Regulation No. 20/2019 on FMCs and Packaging, issued by the National Agency of Drug and Food Control (BPOM), established guidelines to ensure the safety and compliance of materials used in food packaging to protect human health.

The scope of the regulation covers a range of materials including plastics, inks and dyes, paper and paperboard, resins and polymer coatings, metals, ceramics, and glass. It specifies a list of prohibited and authorised chemicals and specifications for the type of materials used as packaging by food and beverage type. It sets strict limits on the migration of substances from packaging into food – typically not exceeding 60 mg/kg or 10 mg/dm² for plastics. It also outlines testing requirements for assessing migration levels, including general and specific migration tests for harmful substances like heavy metals.

The regulation allows the use of recycled materials in food packaging, provided they meet safety standards. Food producers and manufacturers are required to comply with these regulations within a year following its enactment. BPOM is mandated to control and monitor compliance with the regulation, ensuring that FCMs used in packaging meet safety standards and do not pose health risks to consumers. This includes overseeing the testing of materials for migration limits and ensuring that prohibited substances are not present in food packaging.

BPOM conducts pre-market assessments, requiring manufacturers to submit products for evaluation before they can be marketed. Additionally, post-market surveillance is implemented to monitor compliance and address any violations.

CASE 23

ECO-DESIGN STANDARDS AND REQUIREMENTS IN THAILAND

Thailand's Roadmap on Plastic Waste Management 2018 – 2030 underscores the importance of addressing plastic waste at its source. The roadmap seeks to achieve this mainly through preventative measures. This includes bans of certain plastic polymers and products, such as oxo-degradable plastic polymers and expanded polystyrene food containers. It also introduces eco-design standards and requirements as well as plastic packaging mandating enhanced end-of-life options, including recyclability, compostability, or reusability, while also restricting the use of polymers and chemicals of concern. These are key steps for it to achieve its target of a 100 % circularity of plastic waste.

Emphasising bans and mandatory product requirements necessitates strict market surveillance. The legal measures planned encompass mandatory plastic product standards, voluntary design guidelines, sustainable raw material certification systems, and a designated green product list for government procurement. Thailand's longstanding Industrial Standards Framework, established in 1968, is the mechanisms to be used for market surveillance. This is overseen by the Ministry of Industry, with the Thai Industrial Standards Institute serving as the national standards body.

Manufacturers seeking to display the standard mark or product quality certification must undergo a rigorous inspection process to ensure compliance. The marks come in two forms: the General Standard Mark signifying quality for general consumer goods and the Mandatory Standard Mark, required for specific products to meet standards before production, import, or distribution. The Thai Industrial Standards Institute is entrusted with the proactive task of eliminating substandard products from the market. They achieve this through rigorous monitoring of product distribution channels, encompassing both traditional stores and online marketplaces.

CASE 24

THE INTERNATIONAL SUSTAINABLE CHEMISTRY COLLABORATIVE CENTRE (ISC_3)

The **International Sustainable Chemistry Collaborative Centre (ISC_3)** is an international institution founded in 2017 by the German Federal Ministry for the Environment and the Federal Environment Agency. Hosted by GIZ and supported by the Innovation Hub at DECHEMA in Frankfurt, ISC_3 promotes the transition of the chemical sector toward sustainable chemistry and a circular economy. Its mission is to embed sustainability across all stages of product life cycles while fostering behavioural change among all stakeholders.

ISC3 employs a multi-stakeholder approach, engaging policymakers, industry, academia, civil society, and the public. It contributes globally through international chemicals policy, training programmes, advisory services, innovation support, entrepreneurship, and research.

A key initiative of ISC_3 is the **Global Start-up Service**, which supports chemistry-related start-ups at various development stages, from early concepts to established ventures, in fields such as waste management, sustainable energy, and water management. This programme offers tailored assistance including access to international networks, expert mentoring, sector-specific workshops, and participation in the ISC_3 Innovation Challenge. The goal is to help start-ups enhance their sustainability impact and connect with stakeholders and investors, advancing the global agenda for Sustainable Chemistry.

TOOL 12

SCIP DATABASE: ENHANCING TRANSPARENCY ON SUBSTANCES OF VERY HIGH CONCERN (SVHCS) IN PRODUCTS

The SCIP Database is a public resource developed by the European Chemicals Agency (ECHA) to provide information on articles containing substances of very high concern (SVHCs). Established under Article 9(1)(i) of the EU Waste Framework Directive and aligned with REACH Article 33(1), the database aims to enhance transparency throughout the product lifecycle, including disposal and recycling stages.

Since 5 January 2021, suppliers, manufacturers, assemblers, importers, and distributors of articles placed on the EU market that contain SVHCs above 0.1 weight-% are required to notify ECHA. The notification must include details such as the product identity, SVHC identity and concentration, and information on safe use. While non-EU suppliers are not directly obligated under the EU regulation, they are encouraged to provide necessary information to their EU counterparts (e.g. importers) to facilitate compliance.

The SCIP Database serves multiple stakeholders:

- Waste Management Companies: It aids in identifying and managing hazardous substances in waste streams, promoting safer recycling practices.
- Consumers: Upon request, consumers can access information about SVHCs in products, empowering informed purchasing decisions.
- Regulatory Bodies: It supports enforcement of regulations and contributes to policy development aimed at reducing hazardous substances in products.

By centralising SVHC information, the SCIP Database contributes to a circular economy by enabling safer recycling and encouraging the substitution of hazardous substances with safer alternatives.

Link: ECHA: SCIP Database

TOOL 13

CHEMSELECT TOOL FOR SUSTAINABILITY ASSESSMENT OF CHEMICALS AND MIXTURES

The ChemSelect Tool, developed by the German Federal Environment Agency (UBA), is a decision-support tool designed to facilitate the sustainability assessment of chemicals and mixtures. The tool is particularly relevant for industry professionals, researchers, and consultants aiming to compare chemicals based on sustainability criteria or identify potential environmental and health risks. At the core of its functionality is the use of CAS Registry numbers as unique substance identifiers, which users must provide to initiate the evaluation process. Based on this input, ChemSelect automatically retrieves available data on substance classification, physicochemical properties, and environmental toxicity from sources such as the EU REACH candidate list, EU ED list, Sin list, TEDX-Colburn list and GHS hazard statements. Further information with context-specific data, such as details on the substance's application, exposure potential, climate and ozone effects, resource consumption, circularity and supplier responsibility can be added manually by the user if sufficient and valid data is available elsewhere. While ChemSelect provides a structured overview of key sustainability indicators and supports informed decision-making, it is not intended to replace comprehensive life cycle assessments.

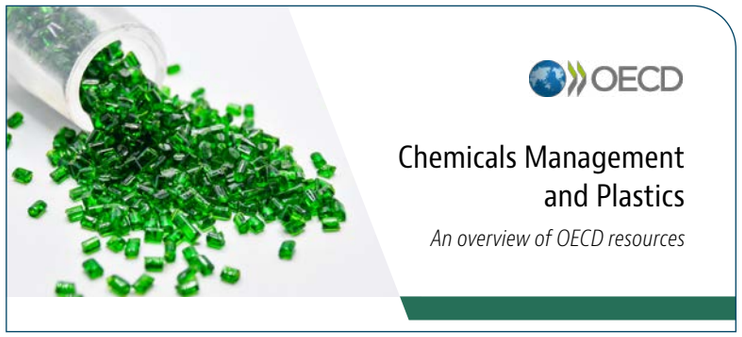
Link: **UBA: ChemSelect Tool**

TOOL 14

OECD RESOURCES AND TOOLBOXES ON CHEMICALS MANAGEMENT AND PLASTIC

The OECD has developed comprehensive guidelines to support the selection of safer chemicals and promote substitution through effective government policies, economic incentives, and third-party tools. Its Substitution and Alternatives Assessment Toolbox (SAAToolbox) compiles over 100 tools and case studies focused on chemical substitution and alternatives assessment. The toolbox provides resources to help users evaluate potential hazards associated with chemicals, materials, processes, and products. It includes tools for exposure assessment, life-cycle

analysis, and consideration of economic and social factors. Additionally, the toolbox offers frameworks, guides, and rating systems from various organisations, accompanied by practical case studies on substitution from manufacturers, academic institutions, NGOs, and government bodies.



Specifically, in the context of plastics, the OECD has developed guidance and case studies to encourage sustainable chemistry thinking when selecting chemicals for the design of more sustainable plastics. This guidance supports better outcomes and a more transparent process by integrating sustainable chemistry principles into the design phase of plastic products

Link:

- OECD: **Risk management, risk reduction and sustainable chemistry**

Further Reading:

- → ISC_3 (2022): **Key Characteristics of Sustainable Chemistry**
- → Australian Department of Climate Change, Energy, the Environment and Water. (n.d.): **Chemicals of concern in plastics**
- → SWITCH-Asia (2024): **Chemicals and Polymers of Concern**
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5 **Wagner, M., Monclús, L., Arp, H. P. H., Groh, K. J., Løseth, M. E., Muncke, J., Wang, Z., Wolf, R., & Zimmermann, L. (2024).** State of the science on plastic chemicals – Identifying and addressing chemicals and polymers of concern. *Zenodo.* **https://doi.org/10.5281/zenodo.10701706**

6 **Secretariat of the Basel, Rotterdam and Stockholm Conventions (2023).** Global governance of plastics and associated chemicals. **https://www.basel.int/Implementation/Plasticwaste/Callforinformation/Globalgovernanceofplasticsandassociatedchemicals/tabid/9378/Default.aspx**

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13 See endnote 5

14 European Commission. (2020): Information flows on substances of concern in products from supply chains to waste operators. *Publications Office of the European Union.* **https://data.europa.eu/doi/10.2873/873130**

15 See endnote 5

The term Problematic, Unnecessary, and Avoidable (PUA) plastics has gained prominence to categorise different groups of plastics that contribute disproportionately to pollution and waste management challenges.

Problematic plastics refer to products which have adverse impacts across the life cycle of the product and include products that are prone to generate emissions and products that contain chemicals or polymers of concern.[1] Many problematic plastics fall into categories such as Single-Use Plastics (SUPs) and sort-lived plastics, high-risk products like fishing gear, microplastics and oxo-degradable plastics.[2, 3, 4] Common examples include single-use plastic bags and food containers, packaging films, bottles, straws, shampoo bottles, and ice cream tubs.

Unnecessary plastics refer to items that serve no essential function.[5] For example, fruits naturally protected by their peel are often needlessly wrapped in plastic.

Avoidable plastics fulfil a function but could be replaced by non-plastic alternatives, alternative designs, or different usage practices.[6] One example are single-use plastic straws, which can be substituted with reusable options made of plastic, wood, or metal.

Many PUA plastics are a significant component of marine litter and pose severe threats to marine ecosystems, biodiversity, human health, tourism, fisheries, and shipping industries.[7, 8] Assessing the necessity of these products, regulating their production, and supporting suitable alternatives are essential steps in tackling plastic pollution.

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REGULATORY MEASURES

Bans and Restrictions | see case 25 | see tool 15

Regulations serve as powerful tools to limit or eliminate the production, import, sale, and use of specific PUA plastics. Complete bans prohibit products from the market, while targeted restrictions limit their use in particular sectors, such as food service. Exemptions and phased implementation periods allow time for businesses and consumers to adjust, especially where alternatives are not yet viable.[9]

Over 60 countries have enacted bans or restrictions on single-use plastics, especially plastic bags and styrofoam products, with many more expected to follow. While comprehensive long-term data remain scarce, evidence suggests these policies reduce consumption substantially; plastic bag bans, for example, have lowered use by 27 % to 100 % in different contexts.[10] Key success factors include robust enforcement, clear regulatory definitions, and ensuring alternatives do not generate new environmental or social harms.[11]

Green Public Procurement

Green public procurement offers public authorities a powerful mechanism to reduce their use of PUA plastics while stimulating demand for sustainable alternatives. Frameworks such as ISO 20400 can guide organisations in embedding sustainability criteria into purchasing decisions.

ECONOMIC AND FISCAL INSTRUMENTS

Taxes and Levies

Economic instruments incentivise producers and consumers to shift away from PUA plastics by altering cost structures. These can include taxes on production, import, or sale of PUA plastics, as well as levies charged

directly to consumers. These tools can increase the competitiveness of sustainable alternatives and generate revenue to support waste management infrastructure, producer transitions, and innovation. | see case 26

ECO-MODULATED FEES

EPR and DRS schemes primarily finance waste collection and recycling. However, they can be designed with eco-modulated fees to encourage producers to adopt reusable or safer materials. Expanding EPR coverage to more PUA plastics can drive innovation and support the development of sustainable products and business models.

COLLABORATION AND VOLUNTARY AGREEMENTS

Voluntary agreements | see case 27 | see case 28 provide flexibility for private sector actors, NGOs, and other stakeholders to identify PUA plastics and implement solutions without the immediate pressure of regulation. Successful voluntary initiatives can set new industry standards and facilitate smoother transitions toward formal regulation by allowing innovation and cost-effective approaches.

AWARENESS AND BEHAVIOUR CHANGE

Public awareness is vital to complement regulatory and economic measures. Informing consumers and producers about the environmental and health risks associated with PUA plastics can shift demand toward safer alternatives and increase compliance with regulations. Effective campaigns use diverse communication channels such as social media, educational programs, television advertisements, and partnerships with schools and NGOs to reach broad audiences and foster community engagement.

CASE 25

EU REGULATIONS ON SUPs AND MICROPLASTICS

The **EU SUP Directive** was introduced in response to mounting evidence of environmental impacts caused by SUP pollution, as Studies showed that the 10 most commonly found SUP items, together with fishing gear, accounted for around 70 % of all marine litter in the EU. By targeting these products, the EU aims to reduce plastic waste, encourage the use of sustainable alternatives, and protect both the environment and public health from pollution. The following SUP products are banned from being placed on the EU market:[12]

- Cotton bud sticks
- Cutlery (forks, knives, spoons, chopsticks)
- Plates
- Straws
- Beverage stirrers
- Balloon sticks
- Food containers made of expanded polystyrene
- Beverage containers and cups made of expanded polystyrene (including their caps and lids)
- All products made from oxo-degradable plastics

In addition, the Directive imposes other measures, such as labeling, design requirements, and EPR on items like plastic bottles, packets and wrappers, wet wipes, sanitary items, cigarette butts, and fishing gear.

In response to increasing concerns over the risks microplastics pose to human health and the environment, the EU adopted **Commission Regulation (EU) 2023/2055**, amending Annex XVII of the REACH regulation. This amendment targets synthetic polymer particles smaller than 5 mm in any dimension, and fibre-like particles under 15 mm in length, which are insoluble, non-degradable, and intentionally added to products by design.

The restriction prohibits the marketing of these microplastics as standalone products (e.g., loose plastic glitter) or in mixtures where their concentration equals or exceeds 0.01 weight %. Covered products include cosmetics, detergents, fertilizers, plant protection products, and synthetic sports field infill.

Following extensive stakeholder consultations, the regulation includes exemptions for certain sectors and uses, along with transitional periods for specific products. These phased restrictions will come into effect between 2027 and 2035, providing companies time to adapt, innovate sustainable alternatives, and enabling Member States to prepare for enforcement.

Once fully implemented, the regulation is expected to prevent the release of 500,000 tonnes of microplastics over 20 years.[13] | see case 20

CASE 26

REGULATING SUPs AND PROMOTING ALTERNATIVES IN SAINT LUCIA

In June 2019, the Government of Saint Lucia enacted a comprehensive ban on the import, use, manufacture, sale, and distribution of styrofoam and SUP food service containers. The policy was developed with a commitment to a just transition, employing life cycle thinking and extensive stakeholder consultations. This inclusive process ensured the selection of sustainable alternatives balanced affordability, environmental impact, and functional performance, while aligning with waste hierarchy principles prioritising waste reduction.

Recognising that sustainable alternatives often carry higher costs than conventional SUP products, Saint Lucia mitigated financial barriers by waiving import duties (typically between 5 % and 20 %) on approved alternatives. This measure aimed to ease the burden on low-income consumers and small businesses and encourage a shift toward sustainable consumption. Such fiscal incentives were integral to achieving policy acceptance and feasibility within the context of a small island developing state where affordability is critical.

To support behaviour change, the government implemented targeted and visual public education campaigns. Video and audio public service announcements proved more effective than traditional news media in raising awareness. The outreach strategy also established SUP drop-off depots and fostered public-private partnerships to co-finance and strengthen awareness efforts.[14]

CASE 27 THE UK PLASTICS PACT AND ITS GLOBAL INFLUENCE

The Plastics Pact Network

The Plastics Pact Network, convened by the Ellen MacArthur Foundation and WRAP, is a global initiative uniting national and regional Plastics Pacts dedicated to eliminating problematic and unnecessary plastics. Launched with the UK Plastics Pact in 2018, the Network has expanded to include 13 pacts worldwide. These pacts bring together businesses, governments, and NGOs to set shared targets and foster innovation in reusable packaging models, improved recycling infrastructure, and optimised plastic design for circularity. Each Pact adapts the core criteria for problematic plastics to reflect local contexts and stakeholder priorities, making the approach both globally coordinated and locally relevant.

The Plastics Pact Network's approach of setting shared yet locally adapted criteria for problematic plastics has proven effective in accelerating the reduction of harmful plastics globally. The UK and South African cases demonstrate the power of multi-stakeholder collaboration, phased implementation, and innovation in developing alternatives.

These pacts illustrate how collective commitment from industry, government, and civil society can drive meaningful systemic change and advance a circular plastics economy.

The UK Plastics Pact

The UK Plastics Pact was the inaugural pact of the Network, launched by WRAP in 2018. It unites organisations responsible for approximately two-thirds of consumer plastic packaging in the UK. The Pact focuses on eliminating problematic and unnecessary plastics, initially targeting eight key items and later expanding to 14 products slated for elimination:[15]

- Disposable plastic cutlery
- Disposable plastic plates and bowls
- Plastic straws
- Cotton buds with plastic stems
- Plastic stirrers
- Household polystyrene packaging
- Oxo-degradable plastic products
- Polyvinyl chloride (PVC) packaging
- Plastic wrapping for multi-sales of tins, bottles, and cartons
- PVC cling film
- Non-compostable fruit/veg stickers
- Non-compostable tea and coffee bags
- Single use, single serving plastic sachets/jiggers in restaurant settings
- Plastic packaging for uncut fresh fruit and vegetables, unless it is demonstrated to reduce food waste

By 2023, the UK Plastics Pact had achieved a 7 % reduction in overall consumer plastic packaging, a 99.8 % reduction in the original eight targeted products, and a 57 % reduction in problematic polystyrene and PVC packaging.[16]

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The South Africa Plastics Pact

Launched in 2021 and led by GreenCape, the South Africa Plastics Pact identified an initial list of 12 problematic plastics adapted to local market conditions:[17]

- oxo degradable plastic,
- PVC bottles, pallet wrap and labels,
- unrecyclable shrink sleeves,
- stickers on fruit and vegetables,
- barrier bags for fruits and vegetables,
- barrier bags at tills, plastic straws,
- plastic stirrers,
- SUP cutlery,
- plates and bowls,
- cotton buds with plastic stems,
- lollipop sticks,
- microbeads in cosmetic

Following consensus on this list, Pact members collaborated on innovation showcases and trials to overcome shared challenges. A key success was the development of a recyclable polyolefin shrink sleeve replacing unrecyclable PVC sleeves used locally.

By 2024, significant progress had been made in reducing problematic plastic items. Over 42 million such items were eliminated, including a 91% drop in straw distribution – 24 million fewer straws since 2020. Barrier bag use fell by 41%, decreasing from 91 million in 2021 to 53 million in 2023. Additionally, there was a 59% reduction in PVC rigid packaging, amounting to 720,000 fewer items than in 2020, and a 78% reduction in plastic cutlery, equating to 13 million fewer items.[18]

CASE 28

THE SINGAPORE PACKAGING AGREEMENT

Launched in 2007, the Singapore Packaging Agreement (SPA) was a collaborative initiative involving the government, industry, and NGOs, aimed at reducing packaging waste. Through collective efforts, signatories achieved a reduction of approximately 62,000 tonnes of packaging waste and savings of around S$150 million. Key measures included refining packaging design to minimise material use, shifting from single-use to reusable containers, and eliminating unnecessary packaging.

After the SPA concluded in 2020, the National Environment Agency partnered with the Singapore Manufacturing Federation in 2021 to launch the Packaging Partnership Programme. This initiative provides companies with access to expert technical support to identify improvement opportunities, monitor and report packaging data, and develop comprehensive 3R (reduce, reuse, recycle) plans.[19]

TOOL 15 APPLYING GLOBAL CRITERIA TO IDENTIFY AND MANAGE PROBLEMATIC PLASTICS: INSIGHTS FROM THE NORDIC COUNCIL OF MINISTERS

The Nordic Council of Ministers has published the Global Criteria to Address Problematic, Unnecessary, and Avoidable Plastic Products, providing a clear framework to guide policy and business action.

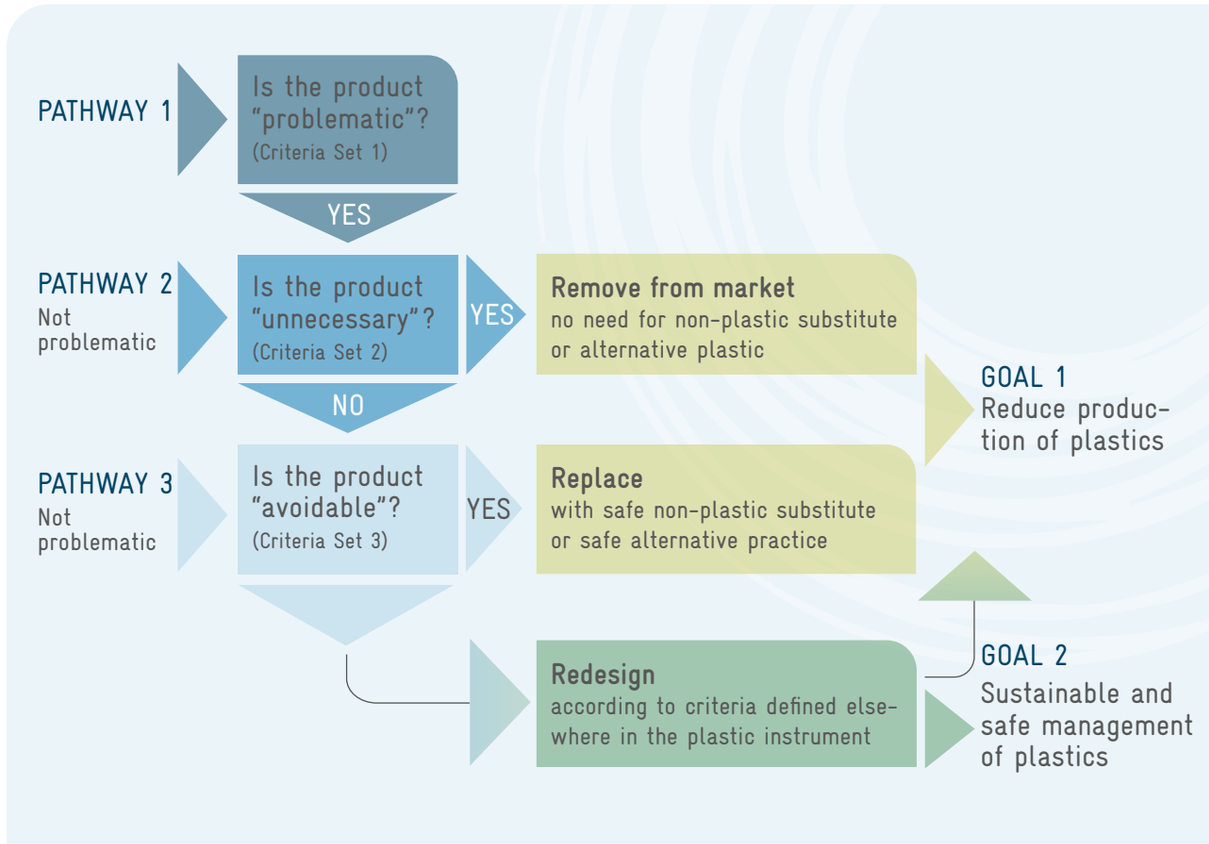

Figure 3: Decision Tree to Determine Actions to Address Problematic, Unnecessary, and Avoidable Plastic Products (Adapted from Nordic Council of Ministers (2024))
This is an adaptation of an original work by the Nordic Council of Ministers. Responsibility for the views and opinions expressed in the adaptation rests solely with its author(s). The views and opinions in this adaptation have not been approved by the Nordic Council of Ministers.

Based on these criteria, the report introduces a simple decision tree (**Figure 3**) to help determine appropriate actions for problematic plastics classified as "unnecessary" or "avoidable" (Pathway 1). Products deemed unnecessary should be targeted for complete removal from the market to reduce plastic waste. For products serving essential functions, the decision tree guides evaluation of whether they can be considered avoidable by exploring available substitutes and alternatives, including non-plastic, reusable options, or changes in use practices. Where no viable alternatives currently exist, fostering redesign and innovation becomes a key priority.

The report also outlines procedures (Pathways 2 and 3) for reviewing products that are not initially classified as problematic, assessing their necessity and avoidability using the same structured approach.

Similar decision tree methodologies have been applied elsewhere, such as in India's voluntary Plastic Pact. However, the Indian criteria for categorising problematic, unnecessary, and avoidable plastics differ from the Nordic Council's framework. Notably, the approach of the Indian Plastic Pact places greater emphasis on a product's recyclability and reusability as central factors in decision-making.[20]

Link:

- Nordic Council of Ministers (2024): **Global criteria to address problematic, unnecessary and avoidable plastic products**

Further Reading:

- → UNEP (2018): **Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations**
- → UNEP (2021): **Addressing Single-Use Plastic Products Pollution using a Life Cycle Approach**
- → Scientists' Coalition for an effective Plastics Treaty (2024): **Policy Brief: The Essential Use Concept for the Global Plastics Treaty**
- → GRID-Arendal & Basel Convention Secretariat (2025): **What Can't We Live Without? Exploring Essential Uses for Single-Use Plastics**
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- → WRAP (n.d.): **The Plastics Pact Network**
- → GRID Arendal (n.d.): **Plastic packaging for food is unnecessary and harmful – Plastic Myths – what can we do?**
- → Food Packaging Forum (n.d.): **Food Packaging Materials and recycling**

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C

Rethinking Design and Use of Plastic Products

While many problematic and avoidable plastic products can be replaced with better suited alternatives, this might not always feasible or environmentally preferable when considering the full lifecycle. Consequently, policies that encourage or mandate the redesign of plastic products are crucial to addressing plastic pollution at its source. Upstream design decisions greatly influence a product's durability, reusability, repairability, and recyclability, which are key determinants of its overall environmental impact.[1]

Adopting circular design principles, such as extending product lifespans and reducing production volumes, can significantly reduce plastic waste generation. This approach prevents leakage of improperly disposed plastics and mitigates health and environmental risks throughout the lifecycle.[2]

However, rethinking product design often faces technical and economic barriers, requiring harmonised measures across the plastics lifecycle to ensure products remain in circulation. Introducing eco-design criteria, reuse standards, and product harmonisation are key strategies to enhance product longevity and quality. Eco-design standards help ensure the safety and feasibility of reuse and recycling while reducing waste that requires end-of-life management.

It is important to note that redesign becomes cost-effective mainly when paired with policies that raise the cost of primary plastics.[3] Moreover, the true repairability, reusability, and recyclability of products depend heavily on the availability of appropriate infrastructure when the product reaches end-of-life.[4]

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REGULATORY MEASURES

Bans and Restrictions

Targeted bans and restrictions PUA plastics and non-circular designs effectively reduce plastic waste and encourage adoption of sustainable alternatives. Such policies often complement eco-design regulations, which focus on minimising material use, extending product life, and improving recyclability.[5]

Eco-Design Standards | see tool 17 | see case 30

Eco-design standards promote reduction, reuse, repairability, recyclability, and minimised emissions throughout product lifecycles. For example, specifying permissible polymer types and limiting complex multi-layer materials can reduce hard-to-recycle waste. To be effective, recyclability criteria must reflect the capabilities of existing waste management infrastructure, ensuring practical and scalable outcomes.[6]

Regulating Planned Obsolescence

Policies addressing planned obsolescence require clear definitions and penalties for designs intended to fail prematurely. They should prohibit restrictive practices, such as contractual clauses or technological barriers, that prevent repair. Mandatory producer responsibilities for repair, including a mandatory access to spare parts, tools, and repair information, empower consumers and independent repair services while encouraging durable product design.[7]

Recycled Content Requirements | see case 30

Setting mandatory minimum recycled content in plastic products reduces demand for virgin materials and associated emissions. Alignment with recycling targets, material standards, and investment in recycling infrastructure is essential to ensure sufficient supply and quality of recycled plastics.

Standards for Recyclable Plastics

Standardising recyclable plastics simplifies sorting, reduces contamination, and enhances recycling efficiency, supporting expansion of recycling capacity at scale.

Transparency and Labelling

Mandatory disclosure of product composition, recyclability, reusability, and repairability throughout the lifecycle enables informed consumer choice and supports proper waste management. Clear, standardised labelling counters misleading environmental claims and aids recyclers in maintaining material quality.

Green Public Procurement

Public procurement policies that prioritise circularity and social impact stimulate demand for sustainable products. Frameworks such as ISO 20400 guide embedding sustainability criteria into tendering and award processes, encouraging suppliers to innovate and meet circular standards.

ECONOMIC AND FISCAL INSTRUMENTS

Tax policies, Levies, and Subsidy Reforms | see case 31

Economic instruments can be used to improve the cost-effectiveness of products that meet eco-design standards, including for reuse. For instance, relative price can be a major consideration for producers in the choice of input material.[8] Instruments that increase the cost of PUA and virgin plastics in relation to alternatives systems and products can increase their use and stimulate investments in increasing the threshold of recycled plastics in new products.

Eco-Modulated EPR Fees | see tool 16

EPR schemes with eco-modulated fees charge producers based on product circularity, rewarding sustainable design and encouraging innovation. Although this adds complexity, it strengthens incentives for durable, repairable, and recyclable products.

VOLUNTARY AGREEMENTS AND MULTI-STAKEHOLDER PARTNERSHIPS

Voluntary agreements can be formed between manufacturers, recyclers, retailers, and government agencies to define shared goals, promote consumer education, and motivate investments in new technologies and innovative products
aligned with circular economy principles. Such agreements are often supported by complementary incentives like grants or tax breaks for research and development. Despite the proliferation of voluntary initiatives, companies participating in the New Plastics Economy Global Commitment currently represent only about 20 % of the global plastic packaging market, leaving a significant portion of the industry outside voluntary circularity commitments.[9] | see case 32 | see case 33

Multi-stakeholder public-private partnerships are also essential in defining national design criteria for plastic products. These collaborative platforms facilitate industry alignment on standards, providing businesses the flexibility to innovate and develop alternatives before regulations become mandatory.

AWARENESS, EDUCATION AND BEHAVIOUR CHANGE

Environmental labelling or eco-labelling schemes

tied to specific plastic design criteria are tools for providing information about the environmental performance or attributes of a product or service through labels or logos. Such labelling schemes can be aligned with ISO 14024, which sets out the principles and procedures for developing environmental labelling programs, including the selection of product categories, environmental criteria, and product function characteristics, as well as the assessment and demonstration of compliance. It also outlines the certification procedures for granting eco-labels.

Digital Product Passports (DPP) | see case 30

can serve as digital records of a product's entire life cycle from material extraction to disposal. For example, a DPP for clothing may specify fabric types, manufacturing processes, and end-of-life disposal options. By standardising data disclosure requirements, DPPs may facilitate reuse, repair, and recycling, supporting the goals of reducing waste and fostering a circular economy.

CASE 29

PVC LABELS BAN FOR BEVERAGE CONTAINERS, SEYCHELLES

In 2013, the government of the Seychelles enacted the **Environment Protection (Beverage Containers and Labels) Regulations**, which require all beverage containers, whether imported, manufactured, distributed, traded, or used, to be made from PET or glass, Labels must be made from paper or PET film, while the use of PVC labels on beverage containers is prohibited. Additionally, any plastic outer packaging used for transporting beverages must be made from PET film.

As a Small Island Developing State (SIDS), Seychelles faces constraints in land availability but generates a high per capita volume of solid waste due to its tourism-driven economy. Although the country currently lacks domestic recycling facilities for PET bottles, it actively collects and exports them for recycling abroad.

CASE 30

ECO-DESIGN REQUIREMENTS IN THE EU SINGLE USE PLASTICS DIRECTIVE AND EU ECO-DESIGN FOR SUSTAINABLE PRODUCTS REGULATION

The **EU SUP Directive** has introduced a range of eco-design requirements for plastic bottles aimed at enhancing the circularity of this ubiquitous packaging material and curbing the growing issue of plastic pollution.

The directive sets ambitious targets for the incorporation of recycled content in new plastic bottles. By 2025, PET bottles must contain at least 25 % recycled plastic. This number will rise to 30 % across all plastic bottle types by 2030. The requirements are designed to stimulate demand for recycled plastics, in turn incentivising the expansion of collection and recycling infrastructure to meet this growing need.

Complementary collection targets are being introduced. By 2025, 77 % of plastic bottles placed in the EU market must be collected for recycling, increasing to 90 % by 2029. Member states are granted flexibility to deploy various measures, such as DRS and/or EPR systems to meet these collection milestones. The recycling targets outlined in the EU's SUP Directive are essential for achieving the minimum recycled content requirements in plastic bottles.

Furthermore, the new **EU Eco-design for Sustainable Products Regulation** introduces a comprehensive framework for setting mandatory sustainability requirements for products placed on the EU market, including products containing plastics and associated chemicals, such as textiles, tyres and paints. Products and components must be designed to improve durability, reliability, repairability, upgradability, and recyclability, and aim to prevent premature obsolescence. The regulation also targets the reduction of hazardous substances in products, requiring disclosure and restriction of chemicals that pose risks to human health or the environment during production, use, or disposal. Additional requirements include the use of recycled content and the provision of a DPP containing information on material composition, recyclability, and the presence of substances of concern.

CASE 31

TAX ON PACKAGING WITHOUT RECYCLED CONTENT IN THE UK

Since April 2022, the United Kingdom has implemented a tax of £200 per tonne on plastic packaging manufactured or imported into the country that contains less than 30 % recycled plastic. The tax applies to packaging where most of the weight is plastic. All companies placing more than 10 tonnes of such packaging on the UK market annually must declare the quantities and pay the tax. The policy aims to create a strong economic incentive for businesses to reduce plastic usage or increase recycled content in their packaging.[10]

Since the tax's introduction, notable shifts in plastic usage and recycling have been observed, including:[11]

- A 12 % reduction in taxable plastic packaging tonnage, reflecting companies' efforts to decrease overall plastic consumption.
- A 6 % increase in plastic packaging meeting or exceeding the 30 % recycled content threshold, rising from 1,293 to 1,371 tonnes, indicating growing compliance to avoid the tax.
- A significant 22 % decrease in plastic packaging imports, likely driven by a shift toward alternative materials or packaging solutions to reduce tax exposure.
- A 6 % decline in revenue from the Plastic Packaging Tax, amounting to approximately £ 268 million in 2023 – 24, down from £ 285 million the previous year – attributable to reduced taxable volumes and higher compliance rates.

CASE 32

VOLUNTARY DESIGN FOR RECYCLING WORKPLAN DEVELOPED BY THE CIRCULAR PLASTICS ALLIANCE

The **Circular Plastics Alliance (CPA)** is a voluntary initiative launched in 2018 by the European Commission to foster collaboration among industry, academia, and public authorities. Its primary goal is to boost the EU market for recycled plastics to 10 million tonnes by 2025, thereby driving the use of recycled plastics across the EU.

With over 330 signatories, the CPA embodies a collective commitment to achieving circularity in the plastics value chain. One of the alliance's cornerstone objectives is to enable "design for recycling"; a strategy to improve the recyclability of collected plastic waste through better product design. The CPA signatories pledge to:

- Develop, update, or revise design-for-recycling guidelines for all plastic products and ensure regular updates to incorporate innovation.
- Actively contribute to updating CEN and industry standards on recyclability to align with technological advancements and market demands.

In 2021, the CPA published its Design-for-Recycling Workplan, a comprehensive document addressing strategies for the five major plastic-using sectors: packaging, agriculture, construction, electronics/electrical equipment, and the automotive sector. The workplan outlines specific approaches tailored to the unique needs of each sector. Additionally, it identifies 26 priority product categories for targeted interventions, which account for over 60 % of all plastic waste in Europe. Interventions concerning these products are expected to deliver significant changes to the recyclability of plastic products.

A major objective of the CPA is to translate design guidelines into European Standards. This effort aligns with the European Strategy for Plastics in a Circular Economy, ensuring that recyclability claims are trustworthy and transparent. The European Commission has further supported this initiative by submitting a standardisation request on plastics recycling and recycled plastics, marking a significant step toward harmonizing design-for-recycling practices across the EU.

CASE 33

THE NEW PLASTICS ECONOMY GLOBAL COMMITMENT ON A CIRCULAR ECONOMY FOR PLASTIC

The New Plastics Economy Global Commitment is a voluntary initiative launched by the Ellen MacArthur Foundation in 2018 in partnership with the UN Environment Programme. The commitment brings together over 1,000 organisations, including businesses responsible for 20 % of all plastic packaging produced globally and more than 50 government signatories.

Signatories to the Global Commitment pledge to the following targets:[12]

- Eliminate problematic or unnecessary plastic packaging by 2025.
- Move from single-use towards reuse models where relevant by 2025.
- Ensure 100 % of plastic packaging is reusable, recyclable, or compostable by 2025.

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- Increase the share of post-consumer recycled content across all plastic packaging by 2025.
- Decrease the use of virgin plastic in packaging by 2025 (for brands and retailers).
- Publicly report progress against these targets every year.

Since its inception, business signatories have stabilised their use of virgin plastics and have more than doubled their share of recycled content.[13] However, recent reports highlight that, while many signatories have outperformed the broader market, others have fallen short of their self-set targets for 2025.[14] Furthermore, the partners of the Global Commitment themselves emphasise the need for binding global policy, as only 20 % of the global plastic packaging market is currently covered by the commitment, and the world remains off track to eliminate plastic waste and pollution by 2025.[15]

TOOL 16

OECD WORKING PAPER ON ECO-MODULATED EPR

The OECD Working Paper on modulated fees for EPR systems discusses the benefits and challenges of adjusting producer fees based on product design to encourage more sustainable practices. It outlines different approaches to fee modulation applied in Belgium, Canada (Quebec), Chile, France, Germany, The Netherlands, Italy, Portugal, Sweden, and United States of America (California). The Paper discusses key issues and considerations for their implementation and puts eco-modulation in EPR in the context of a broader policy framework. Concrete examples for eco-modulated fees related to plastics include a 50 % fee reduction for PE and PP containing at least 50 % recycled material in France and up to 85 % reduced rates for reusable packaging in controlled circuits in Italy.

Link

- OECD: **Modulated fees for Extended Producer Responsibility Schemes**

TOOL 17

PREVENT WASTE ALLIANCE COMMON CRITERIA AND PRACTICAL DESIGN GUIDE TO IMPROVE DESIGN FOR RECYCLING OF PLASTIC PACKAGING

Developed with members of the PREVENT Waste Alliance Circular Design Sub-Working Group, this study identifies key principles and measures to optimise plastic packaging for circularity and recycling:

- Avoid full sleeves or sleeves covering more than 60 % of containers
- Avoid opaque PET and phase out PVC labels
- Ensure components are easily separable during recycling
- Minimise label size and use water-soluble inks and adhesives
- Prioritise mono-materials and simple packaging designs

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- Use removable caps and lids
- Prefer transparent or lightly coloured packaging
- Avoid barriers, additives, or fillers that degrade recycled plastic quality

The study emphasises balancing these design principles with other critical factors, including:

- Product protection requirements that vary by region (e.g., temperature, humidity)
- Alignment with the waste hierarchy to prioritise reduction and reuse
- Compatibility with local waste management infrastructure such as collection, sorting, and recycling systems

A practical eco-design guide is provided, outlining circular design considerations by product category. It features proven real-world solutions such as substituting plastics with alternatives, incorporating recycled content, and improving recyclability. The study also stresses the ongoing need to pilot innovative design approaches to further advance circularity.

Link:

- **PREVENT Waste Alliance: Achieving more circularity in the future global plastics agreement: Common criteria to improve packaging design**

Further Reading:

- GIZ (2021): Design-for-recycling (D4R) – State of play
- EMF (2020): Upstream Innovation: a guide to packaging solutions
- GACERE (2024): GACERE Policy Brief – Circular Design of Plastic
- WRAP (2022): Design guidance for recyclability of household rigid plastic packaging
- EuroCommerce (2023): Circular Talks Toolbox for Circular Packaging in the retail sector
- Scientists' Coalition for an Effective Plastics Treaty (2025): Plastic product design: Core elements
- Quality Infrastructure Council of the Americas (2022): Initiatives and Labels for Plastics for the Circular Economy in Latin America and the Caribbean

1 **Ellen MacArthur Foundation. (2020).** Upstream Innovation: A guide to packaging solutions. **https://www.ellenmacarthurfoundation.org/upstream-innovation/overview**

2 **OECD. (2024).** Policy Scenarios for Eliminating Plastic Pollution by 2040, *OECD Publishing, Paris,* **https://doi.org/10.1787/76400890-en**

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4 **PREVENT Waste Alliance. (2023).** Achieving more circularity in the future global plastics agreement: Common criteria to improve packaging design. **https://prevent-waste.net/wp-content/uploads/2023/05/230207_Prevent_CircularDesignStudie.pdf**

5 **Global Alliance on Circular Economy and Resource Efficiency. (GACERE). (2024).** Circular Design of Plastic Products – Policy Brief. **https://www.unido.org/sites/default/files/unido-publications/2024-04/GACERE%20Policy%20Brief%20-%20Circular%20Design%20of%20Plastic%20Products_0.pdf**

6 **GIZ. (2021).** Design-for-recycling (D4R) – State of play. **https://www.giz.de/de/downloads/2021-06%20Design%20for%20recycling_barrierefrei.pdf**

7 **Leiden-Delft-Erasmus Centre for Sustainability. (2023).** Repair in the circular economy: European legislation, product design and business models. **https://www.leiden-delft-erasmus.nl/uploads/default/attachments/LDE%20Whitepaper%20Repair%20EN_1.pdf**

8 See endnote 2.

9 **Ellen MacArthur Foundation. (2024).** The Global Commitment 2024 Progress Report. **https://content.ellenmacarthurfoundation.org/m/528a7cd095787dec/original/The-Global-Commitment-2024-Progress-Report.pdf**

10 **Gov. UK. (2022).** Introduction of Plastic Packaging Tax from April 2022. Retrieved June 17, 2025, from **https://www.gov.uk/government/publications/introduction-of-plastic-packaging-tax-from-april-2022/introduction-of-plastic-packaging-tax-2021**

11 **BDO UK. (2024).** Plastic packaging tax is working: Receipts fall 6% since last year. Retrieved June 17, 2025 from **https://www.bdo.co.uk/en-gb/news/2024/plastic-packaging-tax-is-working-receipts-fall-6-since-last-year**

12 **Ellen MacArthur Foundation. (2023)**. The Global Commitment Five Years In: Learnings to Accelerate towards a Future Without Plastic Waste or Pollution **https://content.ellenmacarthurfoundation.org/m/11b390e442ce36ba/original/The-Global-Commitment-Five-Years-In.pdf**

13 See endnote 12.

14 **LaRiviere, M. (2024).** CPGs achieved a few 2025 plastics goals early, but they're likely to miss others. *Packaging Dive.* Retrieved June 17, 2025, from **https://www.packagingdive.com/news/ellen-macarthur-foundation-2025-targets-cpgs-miss-achieve/733224/**

15 See endnote 9.

Besides improving product design, the availability and attractiveness of alternative systems and products are crucial to reducing the use of virgin resources and phasing PUA plastics.

Discussions around alternative systems often focus on reuse, refill, and repair systems, which extend product lifetimes by enabling repeated use without significant modification.[1] These approaches aim to minimise waste by reducing the demand for new products. Globally, reuse and refill systems were once widespread before the rise of convenient, disposable plastic packaging in linear economies.[2,3]

Alternative products fall broadly into two categories: alternative plastics and non-plastic substitutes. Alternative plastics typically refer to bioplastics, which include a range of materials that can be biobased and/or biodegradable. | see tool 18 Biodegradable bioplastics can be designed to degrade under specific conditions such as industrial composting, marine environments, soil, or home composting.[4,5] Non-plastic substitutes include other materials like glass, metal, or wood.[6] Both biobased plastics and non-plastic substitutes aim to reduce reliance on conventional fossil fuel-based plastics but come with their own challenges. The sustainability of these alternatives depends on factors such as life-cycle GHG-emissions, environmental impacts, material and service availability, consumer behaviour, and waste processing infrastructure.[7]

Ultimately, successfully shifting toward sustainable alternatives requires a holistic approach involving regulatory frameworks, transparency, consumer education, and robust infrastructure for sorting, collection, and recovery. Without lifecycle thinking and evidence-based policies, there is a risk of simply shifting environmental burdens rather than reducing them.

REGULATORY MEASURES

Bans and Restrictions

Banning or restricting PUA plastics can substantially reduce waste and accelerate the adoption of viable sustainable alternatives and reuse systems. Such regulations often include exemptions for items lacking feasible substitutes or are tailored to specific sectors or applications. It is crucial that bans do not merely shift the problem to other unsustainable alternative and practices. Usual examples include outlawing SUP take-away containers and requiring reusable alternatives to avoid replacing one single use material with another.

Standards and Requirements

Establishing standards and certification schemes for plastic alternatives ensures environmental integrity, transparency, and proper end-of-life treatment. As the range of substitutes grows, evaluating social, economic, and environmental impacts relative to conventional single-use plastics demands a full life-cycle approach, from raw-material extraction to disposal.

Life-cycle assessments (LCAs) offer a means of validating the credentials of alternative systems and products and generally demonstrate that each additional reuse of a product reduces its overall environmental footprint, regardless of material.[8] To be credible, LCAs must adhere to internationally recognised standards (e.g. ISO 14040/44).[9]

see case 34 | see case 35 | see tool 19

Standards for alternative plastics are especially critical for biodegradable materials, where clear definitions and requirements are often lacking.[10] A product should bear a “biodegradable” or “compostable” label only if it satisfies rigorous criteria. These criteria must include a specified degree of biodegradation within a defined timeframe, evidence that any breakdown products are non-toxic, and validation in the precise environment(s) for which the claim is made, whether that be industrial composting facilities, home composting setups, soil, or

marine settings.[11] | see case 36 To ensure clear differentiation, such standards establish quantitative thresholds for categorising materials as biodegradable, industrially compostable, or home-compostable. Widely recognised benchmarks include ASTM D6400 in the United States, EN 13432 in Europe, and ISO 17088 internationally.

Standardising products or parts can enhance viability of reuse and refill systems and enable repairability to reduce waste. For example, many DRS-Systems use standardised and pooled reusable containers that can be exchanged between different manufacturers, which increases the effectiveness of these systems.

Green Public Procurement

Green public procurement can catalyse demand for alternative systems. For instance, implementing zero-SUP policies at public events | see case 40, such as sports fixtures, seasonal markets, concerts, and cultural festivals can offer a test environment for reuse initiatives, raises public awareness, generates market pull for sustainable products, and demonstrates environmental leadership.

ECONOMIC AND FISCAL INSTRUMENTS

Subsidies and Incentives

De-risking private investments in research, innovation, and supporting pilot initiatives for reuse, refill, and repair business models by providing financial and technical assistance through targeted support programmes can enhance the economic attractiveness of sustainable alternatives and to stimulate market uptake. Targeted support programmes | see case 38 can de-risk private investment in research, innovation, and pilot initiatives for reuse, refill, and repair business models by providing financial and technical assistance. Subsidies and tax breaks for companies offering reuse or repair services further lower the cost barrier, encouraging broader adoption and more competitive pricing for circular solutions.

Taxes and Levies

Taxes and levies on PUA plastics impose a financial disincentive, while generating revenue that can be channelled back into circular economy projects, such as expanding reuse infrastructure or improving end-of-life management. When designing such measures, policymakers must ensure that affordable, sustainable alternatives remain accessible, particularly for small businesses and consumers in lower-income communities, where green options can otherwise be prohibitively expensive or simply unavailable[12].

Eco-Modulated Fees

EPR and DRS can also be structured to reward sustainable designs. By obliging producers to fund necessary infrastructure and by setting reuse quotas, these instruments can create direct incentives for refillable and reusable systems. Historically, DRS has focused on glass and plastic beverage bottles, often employing pooled, standardised containers that circulate among multiple producers[13]. Emerging pilots are now extending DRS and EPR mechanisms to other sectors, such as food and cosmetic packaging, with the aim of scaling these models[14].

COLLABORATION AND VOLUNTARY AGREEMENTS

Alternatives and substitutes require innovative business models and innovation to help tackle plastic pollution. Currently, more sustainable options are often inaccessible due to higher prices or lack of availability in lower income areas. This is largely due to low scalability of certain business models. As such, the government has a key role to play in enabling scaling.

Voluntary agreements | see case 27 and collaboration between stakeholders can be key to encouraging businesses to adopt circular models to unleash market opportunities for circular products, services and business models.

Multi-stakeholder agreements can be made between public authorities, private companies, and civil society organisations to enable reuse systems to thrive. For example, some EU countries have introduced public-private collaborations under the form of "Green Deals" which are designed to pilot innovative and sustainable solutions with the aim of addressing regulatory bottlenecks that may prevent the emergence and scaling of these businesses, while enabling the creation of knowledge sharing platforms between stakeholders | see case 39

AWARENESS, EDUCATION AND BEHAVIOUR CHANGE

Environmental Labelling or Eco-Labelling Schemes

Accurate product information on plastic alternatives and substitutes is essential for consumers to understand environmental aspects of alternatives, preventing burden shifts, and maintaining consumer trust in the face of deceptive products. Regulations specifically targeting ambiguous claims and greenwashing reinforce the integrity of environmental messaging for changing behaviours. Offering financial benefits, increased convenience and adequate labelling, alongside information campaigns, encourage a behaviour shift towards more sustainable alternatives. Best practices and guidance documents for both citizens and businesses can support the promotion and uptake of reuse systems by fostering knowledge and understanding of the opportunities of reuse-based product supply systems. | see case 36

Public Awareness

Media campaigns are used to promote consumer behaviour change in favour of sustainable alternatives, reusable products, and reuse systems. These most commonly take the form of digital campaigns through television advertisements, social media posts, documentaries, awareness posters, and roadside banners.

Introduction

a Setting the Framework

b Addressing Plastic Production

c Rethinking Design and Use of Plastic Products

d End-of-Life Management

c1 PRODUCT DESIGN, COMPOSITION AND PERFORMANCE

c2 ALTERNATIVE PRODUCTS AND SYSTEMS

↳ c2.1 INTRODUCTION **c2.2 MEASURES** ↳ c2.3 CASES ↳ c2.4 TOOLS ↳ c2.5 REFERENCES

SERVICES AND INFRASTRUCTURE

Return, Refill and Repair Infrastructure

Scaling sustainable practices hinges on tailored logistics and infrastructure, which differ fundamentally from those of linear systems. Key investments include:

- Return Locations: Reverse-vending machines or depots for deposit-return schemes where consumers can exchange empty packaging for refunds.
- Refill Stations: In-store kiosks allowing shoppers to refill dry goods, cleaning products, and personal-care items using their own reusable containers.
- Repair Services: Workshops and centres that extend the life of electronics, appliances, and other durable goods, many of which contain plastic components.

Equally critical is the infrastructure to manage biodegradable and compostable alternatives alongside organic waste streams. Without compatible collection and treatment facilities, these materials can contaminate conventional recycling or degrade anaerobically in landfills, releasing methane and negating their intended benefits.

Water, Sanitation and Hygiene (WASH) Infrastructure

Improving WASH systems in line with SDG 6, e.g. by installing free public drinking water dispensers or providing tap water of drinking water quality, reduces dependence on single-use water bottles, one of the most used types of plastic packaging.

CASE 34 **LCA ON SINGLE-USE PLASTICS BAGS AND FOOD CONTAINERS AND THEIR ALTERNATIVES IN SINGAPORE**

To support political decisions, the national environmental authority has, commissioned a LCA for common single-use packaging, including carrier bags and containers for food for consumption on site and takeaway, which states to be in accordance with ISO 14040.

The LCA evaluated each product from raw-material extraction through to end-of-life, assuming incineration as Singapore's predominant disposal method and excluding recycling. Functional equivalence was maintained by comparing items that fulfilled the same functional unit, namely carrying an equivalent volume of groceries or meals over a certain timeframe. Key environmental indicators included global-warming potential, water footprint, energy consumption, and land-use change; economic indicators covered full lifecycle costs. The analysis incorporated realistic reuse rates for reusable alternatives, while single-use items were treated as non-reusable.

Results showed that with respect to the functional unit reusable products consistently achieved the lowest overall environmental impact, despite higher water and energy inputs during their use phase. Conventional single-use plastics exhibited the highest greenhouse-gas emissions and energy consumption. Single-use paper and biodegradable options each presented trade-offs, such as elevated water use or substantial land requirements and did not deliver clear environmental advantages. The study concluded that, for Singapore's current waste system, the optimal strategy is to minimise disposable packaging and promote durable, reusable alternatives.[15]

CASE 35 **LCA RESULTS FOR FOUR PILOT PROJECTS DURING THE SUP CHALLENGE IN SOUTHEAST ASIA**

The Incubation Network adopted a "cradle-to-grave" methodology and following the requirements of the ISO 14040/44 standards assessing the environmental impact of a product across its entire life cycle for four solutions piloted during **The PREVENT Waste Alliance Single-Use Plastics Challenge**. Two of studies compared reusable alternatives to current SUP products, while two of the pilots provided single-use non-plastic substitutes.

The objectives of the four LCA studies were to:

- Understand the key factors that drive the negative and positive environmental impacts of SUPs and SUP alternatives.
- Determine how the use of SUP alternatives should be optimised to achieve environmental benefits.
- Identify potential interventions that can support the use of SUP alternatives so that they provide environmental benefits.

Pilots providing reusable and refillable alternatives outperformed SUP options under certain conditions. The most important factor was found to be the number of reuse cycles of the product. For all studies, the number of reuses required to achieve was assessed to be realistic based on actual usage patterns. Additionally, the study highlighted the significant influence of transport on the overall environmental footprint of SUP and reusable containers alike. Optimising transportation routes and reducing the need for long-distance shipping mitigated these impacts.

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Regarding the non-plastic single use substitutes, the study found that they also reduced the environmental impact posed by SUPs. However, for these products it was important to consider the local availability of the raw materials as well as the energy, water, and other resource inputs required during the material extraction stage, as these could potentially lead to environmental trade-offs.

Overall, the LCA highlighted how environmental performance of alternatives varies depending on many different factors at different stages of a product's life cycle including local conditions, logistics, and energy sources. This further emphasises the need for robust LCAs to be conducted within local contexts to adequately inform policy making.[16]

CASE 36

THE EU DIRECTIVE ON EMPOWERING CONSUMERS FOR THE GREEN TRANSITION TO FIGHT AGAINST GREENWASHING AND MISLEADING ENVIRONMENTAL CLAIMS OF ALTERNATIVES TO PLASTIC PRODUCTS

The **EU Directive on Empowering Consumers for the Green Transition** aims to crack down on greenwashing and misleading environmental claims. Closely linked to the issue of plastic pollution and waste management, greenwashing prevents consumers from making informed and sustainable choices.

The Directive prohibits companies from making environmental claims about their products that are not clear, specific, and supported by verifiable evidence. This includes the use vague expressions like "environmentally friendly", "green", or similar statements which give the impression of low environmental impact to the consumer. It prohibits companies from making misleading claims about the biodegradability or compostability of plastic products or packaging. Claims that a plastic product is "climate neutral" or "recyclable" also need to be backed up by credible third-party certification.

By empowering consumers with accurate information, the Directive seeks to incentivise businesses to genuinely improve the environmental performance of their products, rather than engage in greenwashing.

CASE 37

STANDARDISATION PROCESS IN THE EU FOR COMPOSTABLE AND BIODEGRADABLE PRODUCTS

Currently, the harmonised CEN standard EN 13432 sets the minimum requirements for packaging to be considered industrially compostable in the EU. This standard is linked to the EU Directive on Packaging and Packaging Waste (94/62/EC), meaning that packaging meeting the standard is presumed to comply with the Directive's essential requirements for compostability. However, an update to standard EN 13432 has been under consideration in response to criticism of the specified test conditions. This includes concerns about the composting period, which may not accurately reflect the conditions of industrial composting plants in all Member States.[17]

There are no harmonised standards regarding biodegradability under conditions other than industrial composting, such as in soil, home composting, and seawater. The only exception is biodegradable plastic mulch films which are covered by EN 17033. However, a range of national and voluntary private certifications exist (e.g. NF T51-800 in France, AS 5810 in Australia and the private TÜV Austria – OK Biodegradable certification) that could serve as a basis for evaluating such claims.

CASE 38

DRS AND REUSE AS PART OF THE GERMAN PACKAGING ACT

Germany's DRS for reusable bottles dates to the late 1800s, when refillable beverage bottles first appeared as a cost-saving, resource-conserving measure. In the 1960s, a standardised "pool" bottle for beer emerged, allowing bottles to circulate across breweries rather than being tied to a single producer.[18] Participation was initially voluntary, but the 1991 Packaging Ordinance, which was later superseded by the 2019 Packaging Act, mandated that most beverage producers and distributors organise collection and recycling of their packaging, which can be fulfilled by participating in established reuse systems.

An amendment to the Packaging Act in 2023 further requires final sellers of take away food and beverages to offer reusable alternatives for any on-site filled disposable package, regardless of material type.[19] Yet, after two years of implementation, many outlets either fail to provide reusable options or do so only upon customer request.[20]

Notably, a combination of measures, such as the additional introduction of a special local tax for SUPs and municipal grant programmes for the introduction of reusable alternatives in the city of Tübingen has demonstrably increased the usage of reusable packaging in the city of by 400 %.[21] As DRS infrastructure expands to cover a broader range of reusable formats, further growth in refill and reuse is expected.

CASE 39

NETHERLANDS GREEN DEALS

Since 2011, the Dutch government has pioneered the **Green Deals** initiative, fostering collaboration between the government, private companies, civil society organizations, and local and regional authorities to accelerate the transition toward a sustainable economy.

The primary goal of Green Deals is to pilot innovative projects and address non-financial barriers to a circular economy, such as regulatory and administrative hurdles. Each deal clearly defines the initiative's objectives, the actions to be undertaken and the specific contributions of all participants. This structured approach ensures accountability and facilitates the effective implementation of sustainable projects.

While Green Deals do not provide direct financial support, the Dutch government plays a crucial role by:

- Removing Obstacles: Identifying and eliminating regulatory and legislative barriers that hinder sustainable initiatives.
- Offering Experimental Space: Allowing room for pilot projects and innovative experiments to test new concepts.
- Facilitating Networks: Connecting stakeholders across sectors to foster partnerships and knowledge exchange.

This facilitative role aims to create a conducive environment for sustainable innovations to thrive. The Green Deal model can be particularly valuable for the piloting and scaling of businesses promoting reuse by addressing potential regulatory barriers that might prevent scaling of such businesses and improving their competitive advantage.[22]

CASE 40

GREEN PROCUREMENT FOR THE XVI PACIFIC GAMES IN SAMOA

When Samoa was selected to host the 2019 Pacific Games, the government and organisers used the event as an opportunity to promote sustainable practices and reduce single-use plastic waste. Athletes received reusable water bottles, and refill stations were installed for athletes, officials, and spectators throughout the venues. Reusable bags were distributed, food was served in compostable containers, and spectators were encouraged to bring their own reusable water bottles and food containers.[23]

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TOOL 18

INFO BOX ON DIFFERENT TYPES OF BIOPLASTICS

Bioplastics refer to a range of materials which can be biobased or biodegradable or both (**Figure 4**). The terms are often confused in public debates and a high-level of caution is required when promoting bioplastics as alternatives to conventional plastics as their connotations of being bio-based and/or biodegradable can be misleading and could result in regrettable decisions. Therefore, a clear understanding of terminology and distinction between materials is needed:

- Biobased plastics include both conventional non-biodegradable plastics (e.g. Bio-PE, Bio-PP and Bio-PET) as well as biodegradable plastics (e.g. PLA and PHA) made partially or entirely from non-fossil raw materials derived from biological resources.[24] Although, biobased plastics may address certain concerns linked to fossil-based plastics, such as decoupling plastic production from fossil resources and lowering GHG-emissions,[25] they often introduce new concerns such as increased land use, water consumption, eutrophication, and biodiversity loss.[26] Using only agricultural waste and by products as raw materials for biobased plastics can help to mitigate such concerns.
- Biodegradable plastics (e.g. PLA, PHA and PBS) are materials designed to break down fully into natural end products within specified environmental conditions and timeframes. Biodegradable plastics can be biobased but can also derive from fossil-based sources and are further divided into sub-categories, such as industrially and home compostable plastics as well as plastics that degrade in specified natural environments (fresh and salt water, soil).[27] Most of the currently available biodegradable plastics only degrade within a reasonable timeframe in controlled industrial composting facilities.[28] Notably, the use of biodegradable plastics should be carefully assessed, as they are not a simple solution to environmental pollution, are not inherently circular, may disrupt the recycling of conventional plastics if not properly sorted, and require adequate collection and waste management facilities.[29]

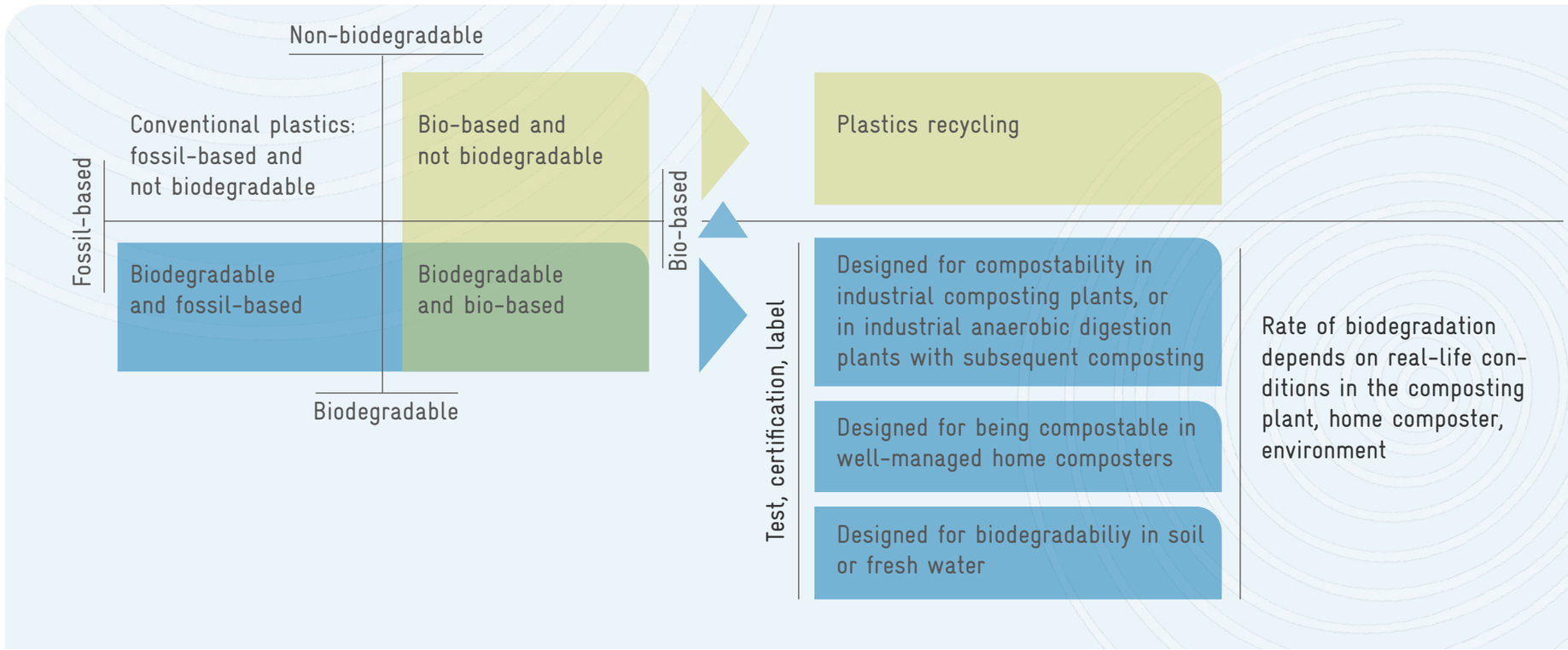

Figure 4: Overview of different categorisations of bioplastics (adapted from European Environmental Agency (2020))

Link:

- **European Environmental Agency: Biodegradable and compostable plastics – challenges and opportunities**

TOOL 19

THE LIFE CYCLE INITIATIVE CRITERIA FOR THE EVALUATION OF LCAs

LCAs can be very effective to ensure informed decision-making for plastic products and their alternatives. They are particularly useful to identify hotspots, defined as the materials or processes in a product's life cycle that have the biggest environmental impact.[30] This aids in focusing policy measures where impacts are greatest. Additionally, LCAs can help avoid burden shifting, where resolving one environmental problem creates others, and ensure alignment with broader goals like the SDGs or national climate targets. However, LCAs are vulnerable to furthering specific interests and there is significant potential for misuse or abuse.

As such, the Life Cycle Initiative have outlined a Four-Point Guidance to help policymakers distinguish between robust science-based LCAs and ill-defined studies that could mislead the early stages of policymaking. According to the guidance, LCAs should meet all the criteria described below to be considered robust and credible:

1. **Adherence to Recognised Standards and Methods:**
   - Is the LCA study compliant with internationally recognised standards such as ISO 14040/14044?
   - Does the study clearly describe its methods and follow established guidance on data quality and impact assessment? (e.g. sensitivity assessments, consistency checks)

2. **Alignment with Policy Objectives:**
   - Does the study's goal and scope fit the policy context?
   - Is the functional unit clearly defined and appropriate?
   - Are the geographic, temporal, and technical contexts relevant to your region or sector?
   - Does it use locally sourced data or adapt international datasets appropriately?
3. **Completeness:**
   - Does the study cover the full life cycle: resource extraction, production, use, and end-of-life stages?
   - Are multiple impact categories assessed (e.g., climate change, water use, human health, biodiversity, resource depletion) and were they selected through a transparent and scientifically rigorous process?
   - Are the system boundaries clearly defined and are the comparisons fair?
4. **Transparency and Review:**
   - Are assumptions, data sources, methods, and uncertainties clearly documented?
   - Has the study undergone independent peer or critical review by LCA and subject-matter experts?
   - Is the review panel free from conflicts of interest and includes diverse perspectives?

Link:

- **UNEP: A policymakers' guide to Life Cycle Assessment**

Further Reading:

- Schneider, H. & Copello, L. (2022): Packaging Reuse vs. Packaging Prevention: Understanding which policy measures best apply
- Ellen MacArthur Foundation (2019): Reuse – rethinking packaging.
- GIZ (2021): Why are biobased and biodegradable plastic not part of the solution to reduce plastic waste?
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- UNEP (2020): Single-use-plastic-bags-and-alternatives-Recommendations-from-LCA-final.pdf
- UNEP (2021): Addressing Single-Use Plastic Products Pollution using a Life Cycle Approach
- UNEP (n.d.): The Life Cycle Initiative
- European Commission – Joint Research Centre (2010): International Reference Life Cycle Data System (ILCD) Handbook – General guide for Life Cycle Assessment
- World Bank (2022): The Plastic Substitution Tradeoff Estimator
- Quality Infrastructure Council of the Americas (2022): Initiatives and Labels for Plastics for the Circular Economy in Latin America and the Caribbean.

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3 **GAIA.** (2024). Life Before Plastic – Demonstrating Traditional Practices of Reuse in Africa. **https://www.no-burn.org/wp-content/uploads/2024/06/gaia-life-before-plastic_ENGLISH.pdf**

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End-of-life management

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Managing plastics at end of life presents a complex, multi-dimensional challenge. Rising consumption has driven waste generation to unprecedented levels. At the same time, the growing diversity and complexity of plastic compositions make recovery and recycling increasingly difficult. In practice, plastic waste management is inseparable from broader municipal solid waste (MSW) systems, involving intertwined service and value chains and multiple stakeholders: public authorities; formal and informal waste collectors and recyclers; plastic producers; and end users.

In many jurisdictions, weak legal, institutional, and financial frameworks compound these difficulties, deterring investment and yielding under-resourced waste management sectors.[1] Creating an enabling environment through clear regulations, strengthened institutional capacity, innovation incentives, and sustainable financing or cost-recovery mechanisms is vital to achieving integrated solid waste management (ISWM) that fully incorporates plastics.

ISWM demands a systems approach, utilising coherent and interconnected services, infrastructure and technologies. The ISWM concept places focus on both the physical/technical and governance aspects of delivering waste and resource management services and facilities.[2]

True ISWM adopts a systems perspective, uniting infrastructure, technology, and governance to deliver coherent waste-and-resource services. There is no single blueprint: globally, a variety of MSW systems have evolved to suit local conditions. Yet common to all is the logistical complexity of collecting and processing every type of plastic product. Without reliable source separation, plastics become entangled with general waste, making recycling difficult, costly, or impossible.[3]

Technologies that are commonly applied for plastics waste management include mechanical sorting and mechanical recovery facilities (MRFs), waste-to-energy and waste incineration facilities, utilisation as refuse-derived fuel and controlled and environmentally sound managed landfills.[4] Each option requires different levels of technical sophistication, investment, and skilled personnel. Emerging processes, such as chemical recycling, offer potential pathways for mixed or hard-to-recycle plastics but remain to be proven at commercial scale and raise concerns about energy consumption and safety standards.[5] | see tool 20

REGULATORY MEASURES

Bans and Restrictions | see case 41

Banning open dumping and burning of MSW can protect public health and improve environmental quality. Such bans prohibit unauthorized waste disposal and uncontrolled combustion. However, eliminating these practices requires more than legislation: it demands reliable collection infrastructure, consistent service provision, vigorous enforcement, and sustained public-awareness campaigns to shift socio-cultural norms.

Landfill bans on un-treated waste fractions compel waste processors to divert materials, particularly plastics, toward recovery and recycling operations. Their success hinges on robust supervision of collection systems: if collected plastic is not traceable, it may end up in unauthorized disposal sites, undermining diversion goals.

Standards and Requirements | see tool 21

Establishing minimum technical standards across all ISWM services, collection, transport, sorting, treatment, and disposal, safeguards public and environmental health. These standards should define:

- Collection Services: Frequency, reliability, source-separation requirements, c
specifications, and worker health and safety protocols.
- Facility Operations: Technical and operational benchmarks for sorting facili
including quality specifications for both sorted plastic feedstock and recycled outputs. |

GIZ (2017): Waste-to-Energy Options in Municipal Solid Waste Management
Holcim & GIZ (2020): Guidelines on Pre- and Co-processing of Waste in Cement Production

A robust licensing and permitting regime can ensure that waste management operators and facilities meet minimum standards and requirements. Licensing of waste management operators transfers duty of care to operators of waste management services. Permits set out operational and environmental standards for waste management facilities.

ECONOMIC AND FISCAL INSTRUMENTS

Diversified MSW Financing

Diversify MSW financing can be considered by authorities to achieve financial sustainability. This can include the deployment of multiple instruments, such as municipal fees, grants, taxes, and private contributions.

Municipal Waste Fees charged to households and businesses constitute the foundation of MSW funding and can be deployed as direct user charges, property-tax levies, or utilities-based surcharges. These fees may consist of fixed charges (a flat rate per billing period regardless of waste volume), variable fees (tiered or per-unit charges based on the general quantity or weight of waste generated), or a combination of both to balance predictable revenue with incentives for waste reduction. In low-income communities, cross-subsidy mechanisms can ensure equitable access to waste collection services.

Pay-As-You-Throw (PAYT) | see case 41 schemes are A special type of variable waste management fees. PAYT charge waste generators based on the specific volume or weight of their residual waste, operationalizing the polluter-pays principle. When paired with effective source separation, PAYT can reduce disposal costs and boost recyclable plastics recovery. The risk of illegal dumping must be mitigated through enforcement and accessible drop-off options.

EPR and DRS

EPR shifts both financial and organisational responsibility for end-of-life management from municipalities to producers. Well-designed EPR schemes fund collection, sorting, and recycling of post-consumer packaging and other products (e.g., textiles, fishing gear). DRS, a subset of EPR, mandates deposits on beverage containers refunded upon return to achieve higher recovery rates for refillable and single-use systems alike.

Plastic-Specific Levies and Credits

Plastic taxes levied on virgin resin, converters, or importers can fund plastic-dedicated recovery systems. Emerging plastic credit schemes allow private entities to purchase credits from certified recovery projects, incentivising collection and recycling of post-consumer plastics.

Performance-Linked Budget Grants

Municipalities can compete for supplemental grants tied to clear performance metrics, such as collection coverage, diversion rates, or recycling targets. Encouraging municipalities to compete for additional top-up funding based on measurable indicators helps to garner and focus efforts from city leaders and departments. | see case 46

Awareness and Behaviour Change

Encouraging behaviour change through the value chain and raising public awareness in plastic waste prevention and management is crucial to improving plastic waste management. Behaviour change rests on providing timely and accurate information to waste generators, backed up by creative messages that catch people's attention. Different approaches to behaviour change are profiled in the behaviour change hierarchy.[6]

Services and Infrastructure

Collection and Sorting Facilities

Separating collection from disposal responsibilities can drive operational improvements and ensure consistent standards. Transferring disposal functions to regional or inter-municipal bodies often delivers economies of scale, professionalises landfill and treatment management, and frees local authorities to focus on collection and recycling services.

Establishing dedicated collection systems for plastic waste is critical to minimise contamination and maximize recovery. Success hinges on sustained public participation. Residents need to be motivated and supported to segregate, store, and deliver plastics for collection. Equally important is continuous monitoring and optimisation of service operators and technical systems to ensure reliability and efficiency.

Material recovery technologies and facilities are required to clean, sort, and prepare plastic waste for reprocessing. In lower-income contexts, labour-intensive sorting often offers greater economic and social benefits than capital-intensive machinery, creating local employment while maintaining cost-effectiveness.

Vigilant cleaning of streets, parks, waterways, and other public areas prevents plastic waste from entering ecosystems. Reliable staffing, equipment, and contingency funds for events or emergencies ensure that litter does not accumulate and trigger the “broken-window” effect – where visible neglect begets further littering and environmental degradation.

Recycling and Waste Treatment Facilities

All collected, sorted and pre-treated plastic waste requires further treatment for recycling and environmental sound management. These treatment steps should be organised in alignment with established waste hierarchies, which prioritise prevention, reuse, and recycling over thermal treatment facilities and disposal. | see tool 20

Plastic waste recycling facilities play a central role in diverting waste from disposal sites towards a circular use. Mechanical recycling currently is the most established approach, converting clean and sorted plastic waste into secondary raw materials. Its effectiveness depends on input quality. Technological improvements in sorting, washing, and extrusion extend its applicability.[7]

Chemical recycling is a collective term for various technical processes that convert plastic waste into its basic chemical components, to be further utilised as chemical feedstock for new plastic materials. Although the technology is still in its early stages and faces challenges relating to cost, energy consumption and environmental impact, it could represent a complementary approach to plastic waste unsuitable for mechanical recycling in the future.[8]

Further application for low-value plastic waste, such as adding mixed plastic waste in asphalt or construction materials, provide a potential low-cost utilisation, but also lead to a possible coth microplastics and chemicals of concern, and extract plastics from a possible circular use in a linear system. |

Energy recovery, through Waste-to-Energy incineration, co-processing in cement kilns, waste to fuel and other thermal methods, provides a controlled option for non-recyclable plastics, | capturing energy while reducing landfill dependence. Modern systems must ensure rigorous emissions controls and energy efficiency to meet environmental standards.

Sanitary landfilling remains a necessary safeguard to prevent open burning and dumping, especially in areas where recycling and recovery infrastructure is currently limited. Properly engineered landfills with leachate and gas management are essential to prevent environmental harm.

Operator Models | see tool 22 | see tool 23

Innovative Service and Operator Models are needed to expand waste services into low-income, informal, and peri-urban communities. Tailored approaches, such as micro-service providers using small motorized or non-motorized vehicles, can extend coverage where traditional collection may not reach. Differentiating service tiers for urban versus rural areas can further enhance cost-effectiveness and responsiveness.

Public-private partnerships (PPPs) offer flexible structures – from service contracts and concessions to fully invested, privately operated facilities – allowing authorities to share risk and leverage private capital. Nonetheless, governments must retain ultimate responsibility for service quality, public health, and environmental protection.

Mandating local authorities to develop and update multi-year waste management plans helps align investment, financing, and service delivery with community needs. | see case 44

CASE 41

LANDFILL RESTRICTIONS AND VARIABLE PAYT FEE SYSTEMS IN GERMANY

In the 1990s, Germany was among the first EU member states to introduce progressive landfill restrictions, alongside measures for segregated waste collection at source. These early policies laid the groundwork for a transition toward a circular economy. By 2005, Germany implemented a complete ban on landfilling waste with total organic carbon content above 3 % or 18 % for mechanical-biologically treated waste, requiring pre-treatment through mechanical-biological treatment.[9] The landfill restrictions became the cornerstone of Germany's waste management success, driving large improvements in material recovery rates and sharply reducing methane emissions from biodegradable waste in landfills. The policy incentivised both public and private sectors to invest in recycling infrastructure, waste sorting systems, and alternative waste processing technologies. The near elimination of landfilling of untreated waste has not only minimised environmental pollution but also enhanced resource efficiency, demonstrating how landfill restrictions can drive systemic change in waste management and circular economy practices.

Furthermore, many municipalities mainly in rural areas and suburbs with single or double-family housing structure introduced variable fee structures that now cover about 30% of the population. The fees in these systems usually depend on the number of containers that were emptied per year or the amount of residual household waste disposed of. While the establishment and operation of variable fee structures can require significant municipal resources, they have been shown to contribute meaningfully to material reuse and recycling objectives for the circular economy as the amount of mixed municipal waste is on average 25% lower when variable fees are applied.[10]

CASE 42

EXTENDING COLLECTION SERVICES WITH A VARIETY OF OPERATOR MODELS IN MAPUTO, MOZAMBIQUE

The Maputo Model represents the case of a large city in a developing country context that has successfully expanded its waste collection coverage to over 90 % of the city. To achieve this, there are five operator models for the collection services applied throughout the city, tailored to specific areas based on delivery location. To extend services to the lowest-income areas of the city, the municipality has implemented a two-step collection service. Micro-enterprises are formally contracted to provide a manual door-to-door service. This waste is subsequently collected by a large private collection company from a block collection point which is accessible for large collection vehicles. This approach allowed for bottom-up provision of services to an area while creating jobs for the local community and allowing for the service to be tailored to the local conditions.[11]

CASE 43

SOLID WASTE MANAGEMENT LEGISLATION IN THE PHILIPPINES

The Philippines have implemented comprehensive solid waste management legislation through two key laws: the Environmental Code (Presidential Decree No. 1152) and the Ecological Solid Waste Management Act of 2000 (Republic Act No. 9003). The Environmental Code established initial policies for waste management, requiring provinces, cities, and municipalities to prepare and implement waste management programs, including environmentally sound landfilling, incineration, and composting.

Building on this foundation, the Ecological Solid Waste Management Act of 2000 (RA 9003) provided a more detailed framework for solid waste management. This law mandates local authorities to develop 10-year solid waste management plans that include:[12]

- Mandatory segregation of waste at the source.
- Collection and transport of solid wastes.
- Recycling programs, including eco-labelling, reclamation, and buy-back centres.

- Establishment of MRFs.
- Proper waste management facilities, prohibiting open dumps and regulating sanitary landfills.

The National Solid Waste Management Commission, assisted by the Department of Environment and Natural Resources, oversees the implementation of these plans. As of May 2023, approximately 79 % of the 10-year solid waste management plans have been approved.[13]

CASE 44

"NO SEGREGATION NO COLLECTION" WASTE MANAGEMENT POLICY IN SAN FERNANDO, THE PHILIPPINES

The City of San Fernando in Pampanga partnered with the Mother Earth Foundation to implement the **Ecological Solid Waste Management Act**. Decentralising waste collection from the city to the smallest and most local administrative "barangay" level has in some locations led to enforcing a "no segregation, no collection" policy and establishing mini-MRFs with financial assistance from the municipality.

This approach has led to significant improvements: the landfill diversion rate increased from 12 % in 2011 to more than 80 % in 2018, reduced annual waste management expenses, and the creation of employment opportunities with fair wages.[14]

CASE 45

CLUSTERS OF MUNICIPALITIES FOR JOINTLY MANAGEMENT OF WASTE DISPOSAL FACILITIES IN THAILAND

Thailand is tackling waste management challenges by encouraging municipalities to work together. This approach focuses on creating clusters where several municipalities can collaborate and jointly manage waste disposal facilities. The central government of Thailand motivates local authorities to group into clusters to manage waste together. Each cluster has a host organisation that can be the biggest municipality in the cluster or the provincial administrative organisation. These hosts need to manage their waste treatment sites.

After the adoption of Cabinet Resolution 16/06/2015 over 700 local administrative organisations were grouped into 324 clusters for waste management in 2018 and this number was further reduced to 262 clusters in 2019. The policy for the establishment of the clusters was formulated in a Guideline for cooperation between local authorities in MSW management.[15]

CASE 46

KOSOVO MUNICIPAL PERFORMANCE GRANT FOR CLEAN ENVIRONMENT

The Municipal Performance Grant-Clean Environment (MGP-CE) is a performance-based grant scheme for the Kosovo municipalities, which was initially established in 2009. Responsible institutions for solid waste service were able to gain performance-based access to capital investments for the development of their integrated solid waste management system. The access criteria and indicators that measure performance have been designed in line with the Kosovo Integrated Waste Management Strategy,[16] which outsets the planned progression of waste management services towards better service standards in line with EU accession requirements.

TOOL 20

WASTE MANAGEMENT HIERARCHIES

Waste hierarchies are used in policy formulation and services/infrastructure planning as a tool that ranks waste management options according to their environmental impact. Globally, different versions of waste hierarchies exist in different contexts, which may differ in scope, definitions and prioritisation. The EU was one of the pioneers of applying a waste hierarchy to shape decision making on systems/technological approaches to ISWM. The European Waste Framework Directive sets the basic concepts and definitions related to waste management, including definitions of waste, recycling and recovery. Article 4 defines the waste hierarchy: prevention, preparing for re-use, recycling, other recovery (e.g., energy recovery), and disposal (**Figure 5**). Following this, preventing waste is the preferred option before recycling and recovery. Sending waste to landfill is considered the last resort.

Link:

- **European Commission: EU Waste Hierarchy**

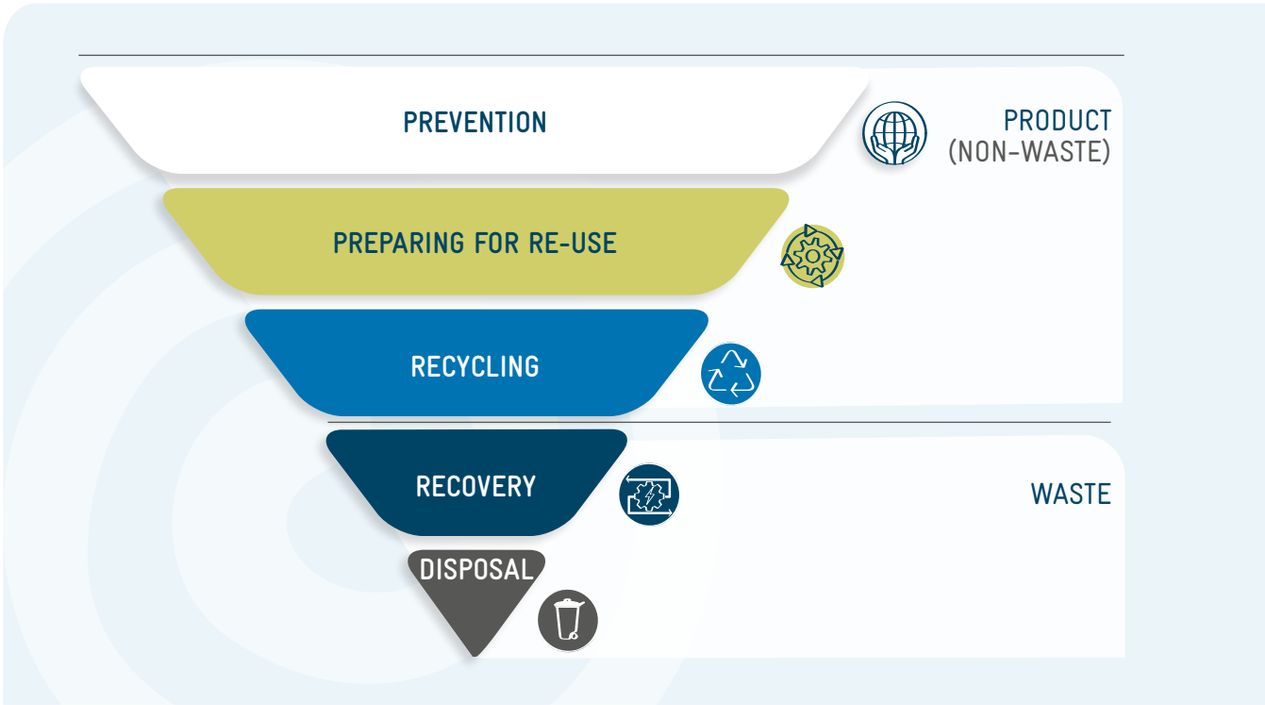


Figure 5:
The Waste Hierarchy defined by the EU (Adapted from: European Commission. (n.d.)) Waste Framework Directive.

TOOL 21

BASEL TECHNICAL GUIDELINES ON THE ENVIRONMENTALLY SOUND MANAGEMENT OF PLASTIC WASTES

The Guidance on the environmentally sound management of plastic wastes was promulgated in the Sixteenth meeting Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal in May 2023. It provides technical guidelines for the identification and environmentally sound management of plastic wastes and for their disposal. Plastic wastes, covered in the guidelines include the following classified entries:

- Entry Y48 in Annex II for all plastic wastes, including mixtures of such wastes that are not classified as hazardous under the Convention's main criteria but still require special consideration due to their potential risks and are subject to the Basel Prior Informed Consent (PIC) procedure
- Entry A3210 in Annex VIII ("List A") for plastic wastes classified as hazardous waste and are subject to the Basel PIC procedure
- Entry B3011 in Annex IX ("List B") for plastic wastes that are presumed to not be hazardous and are not subject to the Basel PIC procedure.

Furthermore, the guidelines cover plastic wastes extracted and/or separated from several other waste streams that have plastic components or consist partially or fully of plastic e.g., wastes collected from households (Y46), waste electrical and electronic equipment (WEEE), waste vehicles, waste cables, waste lead-acid batteries and waste textiles.

Link:

- **Secretariat of the Basel Convention: Technical guidelines on the environmentally sound management of plastic wastes**

TOOL 22

CHARACTERISING CURRENT WASTE MANAGEMENT PERFORMANCE AGAINST THE NINE DEVELOPMENT BANDS AND WACT LADDERS OF CONTROL

The nine development bands (9DBs) framework (**Figure 6**) is a conceptual framework and global theory of waste and development that allows for cities and countries to assess their current situation and target key areas of focus for governance reform and technical system improvement. The 9DBs framework characterises the current position of a city or country's solid waste management system. Cities and countries in early development bands (DB 1 through 4) are characterised by gaps in collection service coverage and incomplete management in controlled recovery and disposal facilities. DB 5 represents the baseline of meeting SDG 11.6.1, universal collection coverage and management in controlled facilities, and DB 6 – 9 represents different typologies of high performing waste (and resource) management systems.

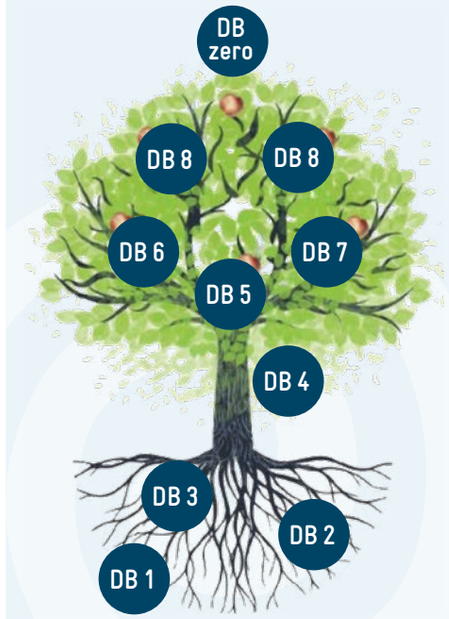


Figure 6: The Nine Development Bands (9DBs) Conceptual Framework (adapted from Whiteman et al, (2021))

The nine development bands use simple, step-by-step "ladders of control" (**Figure 7**), based on facility standards in the UN Habitat WaCT, to help cities track and improve their waste and resource management systems. There

is an incremental pathway from uncontrolled dumping/burning to full environmentally sound management facilities. Rather than treating facility control as a simple yes/no question, the ladders of control enable cities to benchmark their current performance, set realistic goals like achieving "basic control" as an intermediate step, and subsequently move toward "full control" in line with international best practices. By making progress transparent and manageable, these ladders help cities track, communicate, and celebrate each improvement on their journey toward environmental sound waste management and global sustainability standards.

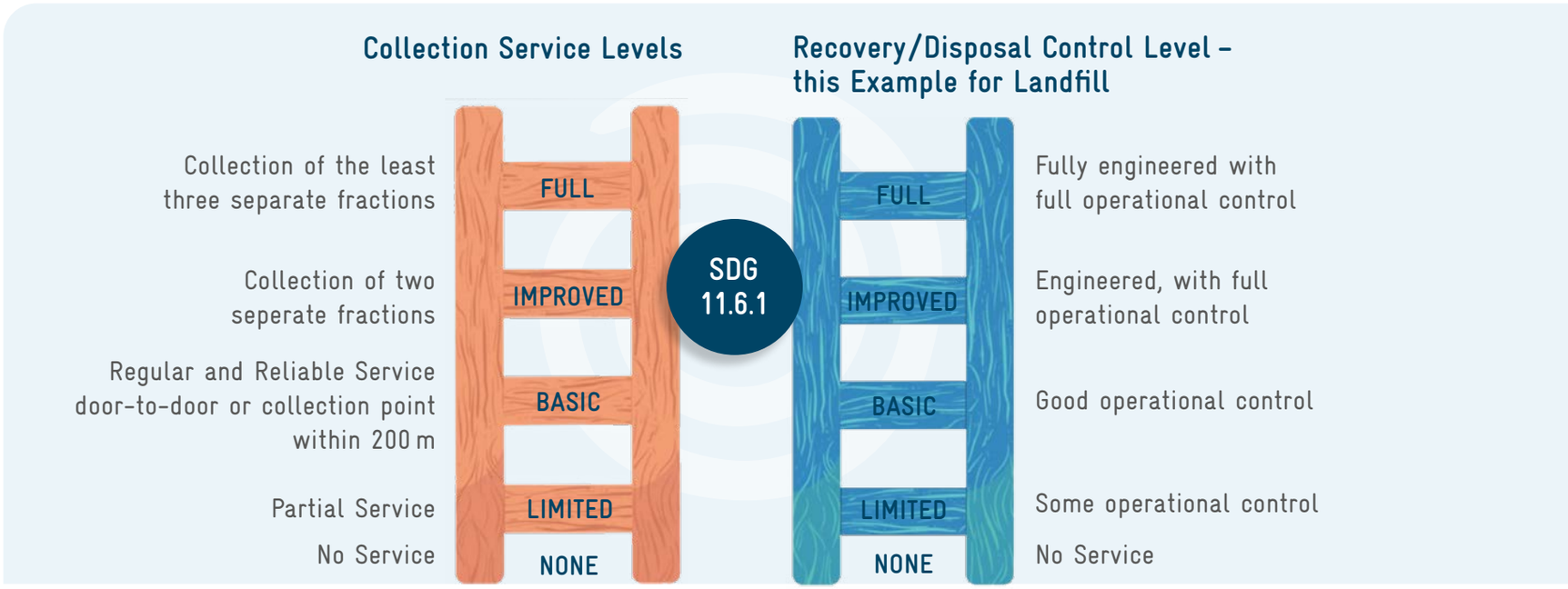


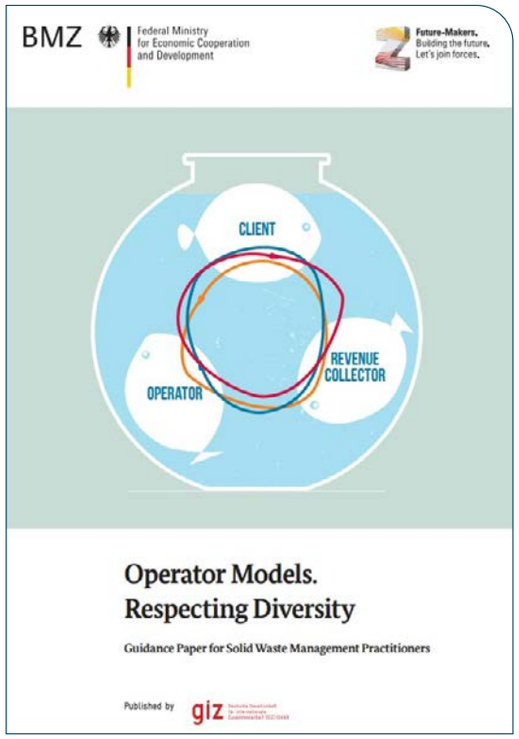
Figure 7: WaCT Collection Service Ladders and Recovery/Disposal Ladders of Control (adapted from Whiteman et. al. (2021, 2025))

Link:

- **Whiteman et al. 2021:** The nine development bands: A conceptual framework and global theory of waste and development **https://journals.sagepub.com/doi/full/10.1177/0734242X211035926**
- **Whiteman et al. 2025: Rethinking waste and resources management for underserved communities**

TOOL 23

GIZ GUIDANCE PAPER ON ISWM OPERATOR MODELS



The Guidance Paper *"Operator Models. Respecting Diversity"* from 2013 provides a structured framework for understanding how waste management services are organised in cities through various operator models. It identifies 42 common models that define the roles and interactions between municipalities (clients), service providers (operators), and revenue collectors, covering key aspects such as ownership, decision-making, financial flows, and contractual arrangements.

Annex B of the report provides the common operator models tool, which was designed to help waste management practitioners analyse existing systems, improve service efficiency, and select the most appropriate model for their local context. Cities can use this tool to benchmark their waste management structures, enhance financial sustainability, and implement more effective service delivery strategies tailored to their specific needs and resources.

Link:

- GIZ: **Operator Models – Guidance Paper for Solid Waste Management Practitioners**

Further Reading:

- UNEP (2024): Global Waste Management Outlook 2024
- UNEP & UNITAR (2013): Guidelines for National Waste Management Strategies
- German Federal Ministry for the Environment (2016): Germany's expertise for an advanced circular economy
- GIZ (2017): Waste-to-Energy Options in Municipal Solid Waste Management
- Holcim & GIZ (2020): Guidelines on Pre- and Co-processing of Waste in Cement Production
- GIZ (2021): Plastic waste for affordable building material – the silver bullet?
- ISWA (2024): Principles and Guidance for Lasting Change
- UN-Habitat (2010): Collection of Municipal Solid Waste in Developing Countries
- World Bank (2021): Bridging the Gap in Solid Waste Management: Governance Requirements for Results
- World Bank (2024): Municipal Solid Waste Cost Calculation Technical Guidelines for Low and Middle-Income Countries.

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2 **Whiteman, A., Webster, M., & Wilson, D. C. (2021).** The nine development bands: A conceptual framework and global theory for waste and development. *Waste Management & Research,* 39(10), 1218–1236. **https://doi.org/10.1177/0734242X211035926**

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4 See endnote 3

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8 See endnote 7

9 **European Environment Agency (EEA). (2022).** Early warning assessment related to the 2025 targets for municipal waste and packaging waste. **https://www.eea.europa.eu/publications/managing-municipal-solid-waste/germany-municipal-waste-management**

10 See endnote 9

11 **Japan International Cooperation Agency. (2023).** The Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo: Maputo Model. **https://openjicareport.jica.go.jp/pdf/12349239_02.pdf**

12 **Republic of the Philippines. (2000).** Ecological Solid Waste Management Act of 2000 (Republic Act No. 9003). **https://www.officialgazette.gov.ph/2001/01/26/republic-act-no-9003/**

13 **Philippines Department of Environment and Natural Resources. (2023).** NSWMC okays solid waste management plans of 54 LGUs. Retrieved June 18, 2025, from **https://denr.gov.ph/news-events/nswmc-okays-solid-waste-management-plans-of-54-lgus/**

14 **GAIA. (2019).** Picking up the baton: Political will key to zero waste. **https://www.no-burn.org/wp-content/uploads/2021/11/San-Fernando.pdf**

15 **Petkanjanapong. P. (2020).** Clustering and Public-Private Partnerships: The Tools of Municipal Solid Waste Management Reformation in Thailand', in Kojima, M. (ed.), Regional Waste Management – Inter-municipal Cooperation and Public and Private Partnership. *ERIA Research Project Report FY2020 no. 12, Jakarta: ERIA*, pp.168 – 183. **Clustering and Public-Private Partnerships: The Tools of Municipal Solid Waste Management Reformation in Thailand**

16 **Republic of Kosovo – Ministry of Local Government Administration. (2024).** Municipal Performance Grant for the fiscal year 2025 based on the performance assessment of fiscal year 2023. **https://helvetas-ks.org/demos3/wp-content/uploads/2024/08/ENG-Rregullat-e-GPK-se-2025.pdf**

According to estimates, 152 million tonnes of plastic waste have already accumulated globally in rivers and oceans. Without ambitious new policy interventions, this cumulative stock of plastic waste is projected to nearly double by 2040, reaching 300 million tonnes.[1]

Plastic waste enters the environment and the ocean from a variety of different pathways during all stages of the plastics lifecycle, from production, to use, all the way through to end-of-life management. Major sources include plastic pellets entering the environment during production or through accidents (e.g. spills), microplastics leakages from use and cleaning of products containing plastics, littering and poor management of waste at collection points, recovery and disposal facilities. The proportion of marine plastic pollution from land- and sea-based sources varies by region and debris type. While most plastic entering the ocean globally is thought to originate from land-based sources, studies of floating debris in accumulation zones like the Great Pacific Garbage Patch show that a significant share comes from sea-based sources, particularly abandoned, lost, or otherwise discarded fishing gear (ALDFG) which has been tied to severe negative impacts on marine ecosystems as well as negative socio-economic impacts on local communities.[2, 3, 4] Plastic pollution in the environment has a range of ecological impacts including entanglement and ingestion by wildlife and causes health and socio-economic impacts on communities.[5, 6] Other elements of existing pollution from the plastics lifecycle cover air pollution by plastic associated chemicals as well as GHG-emissions along the plastics lifecycle.

For plastic that is already present in the environment, clean-up measures can address their potential impacts. Clean-ups can further serve as effective awareness raising tools for the need for proper waste prevention and management practices and can lead to subsequent behaviour change among participants.[7]

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While remediation measures are commonly carried out across the world, their effectiveness can be limited when policies are not aligned, resources are insufficient, or responsibilities among stakeholders unclear. Such challenges can lead to fragmented efforts, duplication or gaps in action, as well as a lack of long-term impact. Moreover, without proper waste management systems in place, it cannot be assured that cleaned-up waste does not simply re-enter the environment.

Thus, effectively addressing legacy plastic pollution requires a combination of efforts and a coordinated approach involving multiple stakeholders. Remediation measures, such as clean-ups, must be part of broader strategy that addresses leakage points, prevents recurrence, and stops plastic pollution at its source.

Introduction

a Setting the Framework

b Addressing Plastic Production

c Rethinking Design and Use of Plastic Products

d End-of-Life Management

d1 WASTE MANAGEMENT AND RECYCLING

d2 EXISTING PLASTIC POLLUTION

↳ d2.1 INTRODUCTION **d2.2 MEASURES** ↳ d2.3 CASES ↳ d2.4 TOOLS ↳ d2.5 REFERENCES

REGULATORY MEASURES

Standards for Clean-Up Measures, Marking and Monitoring

Official standards and requirements regarding safe and environmentally sound clean-up activities and technologies currently do not exist on international or national levels but could be key for identifying appropriate remediation activities and providing guidance on the opportunities, costs, and risks associated with implementing these technologies. However, several toolkits, recommendations and best practices are currently available and can be found under tools and best practices. | see case 47 | see tool 24

Implementing mandatory gear marking requirements for fishing gear facilitates traceability. Vessel identification and owner contact details are required on marked fishing gear to enable the subsequent tracing of lost gear. Being able to identify the vessel responsible for lost gear allows authorities to enforce regulations against improper gear disposal, holding the owner liable.

Determination of non-harmful and achievable target values for Good Environmental Status in different coastal and marine compartments provide a good framework for environmental monitoring for progress. Target values are best defined together with assessment of the presence and impacts of marine litter in the country or region.

ECONOMIC AND FISCAL INSTRUMENTS

Clean-Up related Fees for Selected Products

Special product fees linked to public cleaning expenses | see case 48 can help leverage financial contributions for clean-ups. Public authorities can establish dedicated funding programs specifically for marine litter clean-up efforts and set aside budgetary funds for such services as required. Areas with high concentrations of litter, such as rivers and coastal areas, are often priority targets for clean-up efforts. Sensitive ecosystems like seagrass meadows and mangrove forests also demand particular attention.

Including Clean-Ups to Waste Management Service Contracts

In areas where waste management services are contracted-out, contract-clauses may place responsibility on the operator to remove waste already present in the environment alongside their work to keep the service area clean. Removing existing waste and debris that is scattered in the environment provides a clean slate for new waste management initiatives, including improving and extending collection services and standards at waste management facilities. Relevant actions can include funding for street sweeping which is a crucial part of effective waste management with wide benefits such as stopping drains from blocking and flooding. EPR | see case 48 and plastic credit schemes may also include mechanism to fund or cover the costs of litter clean-up or can be specifically set up (e.g. EPR for fishing gear or credit schemes for ocean bound or ocean retrieved plastics).

Incentives for Litter Retrieval

Marine litter retrieval programs can incentivise recovery of legacy pollution and ALDFG. Mandatory reporting complements such programs. Higher retrieval rates may be achieved by financially compensating operators of vessels to retrieve litter and/or for surrendering old or damaged fishing gear (e.g. through fishing for litter programmes).

COORDINATION AND VOLUNTARY AGREEMENT

Voluntary Initiatives for Clean-Up

Voluntary initiatives can play a vital role in removing plastic debris while also fostering public engagement and raising the profile of national and local environmental efforts. Collaboration with schools, NGOs, and businesses enhances the effectiveness and long-term impact of these programmes, especially when supported by consistent funding for essential supplies and personal protective equipment. Such voluntary and community-led clean-ups are most effective when integrated into broader awareness campaigns and systematic interventions, ensuring proper waste disposal and educating residents about the importance of clean beaches and responsible waste management habits.

Establishing baselines and measuring the social and economic benefits of clean-up activities are crucial for maintaining plastic-free environments and justifying ongoing investment.[8] Additionally, data collected through citizen science during voluntary clean-ups can provide valuable, cost-effective monitoring information, offering broad geographical and temporal coverage that supports more comprehensive analyses.[9] | see case 8

International Collaboration

International initiatives help raise public awareness and foster collective action. World Cleanup Day, Environment Day, | see case 49 and International Coastal Cleanup, for instance, are major internationally recognised initiatives headed by NGOs and international organisations which unite millions of people around the globe to participate environmental and beach clean-ups annually. These provide significant opportunities for national governments and local authorities to leverage the momentum needed for larger-scale community participation and to integrate awareness raising campaigns on sustainable production and consumption, and proper waste management practices.

Multi-stakeholder partnerships can also feed into the setting of international standards and best practice dissemination. For instance, loss of plastic pellets, flakes and powders to the environment from manufacturing processes can be reduced through implementing voluntary programmes. Examples include Operation Clean Sweep, a voluntary programme improving awareness, disseminating best practices and support to industry to prevent plastic pellet losses including during transport. A further example is the Global Ghost Gear Initiative which works with the fishing industry on the development and implementation of best practice frameworks to tackle the impacts of ALDFG.

SERVICES AND INFRASTRUCTURE

Litter Management Infrastructure

ISWM and proper handling of waste collected during clean-ups is key to ensure that this waste does not simply re-enter the environment after the clean-up campaign. This entails addressing any barriers preventing waste from entering proper waste management systems as well as providing regular and reliable waste collection services and controlled recovery and disposal. For marine litter, equipping ports with dedicated fishing gear disposal facilities allows fishermen to properly dispose of their own waste and any ALDFG collected while out at sea. Furthermore, the potential role of informal workers in organised clean-up and waste management efforts can be considered.

Litter Removal Technologies | see tool 24

In recent years, new plastic removal technologies have been developed for collection of plastic and marine litter in rivers and at sea. These include floating river booms and surface sea collection technologies, as well as methods and technologies for collecting submerged marine debris. While these can be effective to collect waste, they are often costly and could without proper application harm existing ecosystems and marine life.[10]

CASE 47

MARINE LITTER DESCRIPTOR FOR GOOD ENVIRONMENTAL STATUS UNDER THE EU MARINE STRATEGY FRAMEWORK DIRECTIVE

The **Marine Strategy Framework Directive** includes marine litter as an indicator for achieving good environmental status in European seas. It specifies that the type and amount of marine litter do not cause harm to the coastal and marine environment. EU Member States are required to assess the composition, quantity and spatial distribution of litter on coastlines, in the water column and on the seafloor. A threshold of 20 pieces of litter per 100 metres of coastline has been set as a benchmark for the good environmental status. Monitoring programmes have shown that the amount of litter varies across different regions, with median values varying considerably. Efforts to reduce marine litter have led to progress in reducing the incidence of certain types of litter, such as single-use plastics and fishing-related items. To support such assessments, the European Commission has developed **guidelines for harmonised monitoring** methods to improve data consistency and comparability across EU countries.

CASE 48

ECONOMIC AND FISCAL TOOLS FOR FUNDING FOR CLEAN-UPS IN EUROPE

Three notable cases from Europe demonstrate different approaches to integrating costs associated with handling existing plastic pollution via regulations on the private sector.

Norwegian Retailers' Environment Fund

The Norwegian Retailers' Environment Fund was established in 2017 in response to the EU's Plastic Bag Directive and requires retailers to contribute a small fee per plastic bag sold instead of paying a government tax. The funds support environmental initiatives, including Cleanup Norway in Time, the world's largest professional clean-up programme.

As of September 2024, the fund has invested $46 million, cleaning over 40 % of Norway's coastline, with a target of 70 % by 2028. The programme focuses on inaccessible, hazardous areas best handled by trained professionals. The fund also prioritises data collection to guide future clean-ups and prevent marine litter at its source.

Netherland's EPR Scheme for Litter Clean-Up

Since 2023, Dutch producers of single-use plastics, such as tobacco filters, food packaging, cups, plastic bags, drink containers, balloons, wet wipes, and fishing gear, must contribute financially to an EPR scheme for the management of litter caused by their products. Producers are also required to raise consumer awareness about proper disposal and submit a plan every three years detailing their efforts to reduce littering.

German Single Use Plastics Fund

Since 2023, the Single Use Plastic Act applies to a range of products, including food containers, beverage cups, plastic bags, and wet wipes.

The legislation targets a reduction of single-use plastics by imposing a fee on producers of such products, paid into a common fund. This fund covers costs associated with cleaning public spaces from littered plastic waste, waste management measures, and awareness campaigns on the consequences of plastic pollution. Companies are required to register with the Federal Environment Agency and collect data on their plastic usage. The rates are determined based on the type and quantity of products placed on the market.

CASE 49

WORLD CLEANUP DAY

World Cleanup Day is a global initiative launched in 2018 by Let's Do It World, an Estonian NGO, with the goal of mobilising people worldwide to participate in clean-up activities. Since its inception, over 100 million people (equivalent to over 1% of the global population) have taken part in clean-up events across the globe. Beyond removing litter from urban areas and natural environments, World Cleanup Day serves to raise awareness about the urgent need to improve waste management systems and promote sustainable production and consumption practices.

On December 8, 2023, the United Nations General Assembly established September 20 as World Cleanup Day on the UN calendar, inviting all UN member states to observe the day through activities aimed at mobilising people to participate in coordinated voluntary action, empowering collaboration, and raising broad awareness of the need to reduce waste pollution. The event is expected to continue to grow in significance and recognition presenting an opportunity to inspire large-scale participation from various to stakeholders. In addition, the **Ocean Conservancy coordinates the International Coastal Cleanup global initiative**, mobilising volunteers across the globe.

CASE 50

FINANCIAL SUPPORT PROGRAMMES FOR REMOVAL OF FISHING GEAR AND OTHER MARINE LITTER

Government-Funded Marine Litter Buyback in South Korea

South Korea operates a government-funded buyback programme that pays fishing crews for marine litter they recover at sea. Fisherfolk receive durable bags to collect fisheries-related debris during their trips. Once they return to port, the local authorities share the disposal costs with the central government.[11] Over five years, this scheme recovered more than 29 000 tonnes of litter, proving both cost-effective for waste collection and a valuable supplementary income for fishermen.[12]

EU-Wide "Fishing for Litter" Initiative

Across the EU, several countries and municipalities have implemented **"Fishing for Litter"** programmes. The programme was originally started in the environmental organization KIMO with the aim to clear the North Sea of litter. Since then, it has been implemented in Belgium, Germany, the U.K., Ireland, Sweden, Norway, Denmark, Italy, Croatia and Spain.[13] Like other programmes, fishermen are given bags to separate litter from their fish catch and the programme covers the costs associated with waste disposal at participating ports. However, fishermen are not compensated directly, and their participation is voluntary.

NGO-Led Waste Removal in Low- and Middle-Income Countries

Non-governmental organisations and social enterprises have replicated this model in low- and middle-income countries. For example, BVRio partners with artisanal fishers in Brazil and Mozambique, paying them to remove waste from coastal waters and mangroves for a few hours each week. Collected debris is weighed and logged via the **KOLEKT waste-management** app before being handed to local recycling cooperatives or sent for controlled landfill disposal.

TOOL 24 SPREP FACTSHEET – PLASTIC REMOVAL TECHNOLOGIES

In 2023, the Secretariat of the Pacific Regional Environment Programme and the Scientists' Coalition for an Effective Plastics Treaty published a factsheet on plastic-removal technologies. The study shows that most removal methods are unselective and pull up plastics alongside natural debris and marine organisms. Many of these technologies are expensive, need high maintenance and can harm biodiversity. The most effective solutions intercept plastics before they reach waterways. Crucially, the factsheet emphasises that plastic pollution must be tackled at its source rather than relying on end-of-pipe removal.

Beach Clean-Up Technologies:

- Manual Collection selectively removes plastics but is inefficient for large-scale cleaning.
- Beach Grooming (Tractors/Robots) sieve or rake sand to remove plastics but destroys habitats, reduces biodiversity, and removes essential organic debris.

Harbour and Coastal Clean-Up Technologies:

- Sea bins/floating traps capture small amounts of plastic (~5.9 g per day) but do also collect and harm many marine organisms (one organism for every four plastics items caught).

River and Estuarine Technologies:

- Floating booms and floating barriers capture floating plastics before they enter the ocean but are ineffective for submerged debris.
- Bubble curtains use air bubbles to push plastics toward collection points, minimising impact on marine life.
- Watercraft clean-up vehicles collect floating waste but are expensive and require constant maintenance.

Ocean Surface Clean-Up Technologies:

- Ocean surface cleanup technologies mostly use nets towed by ships to collect plastics but cause high bycatch mortality and release significant CO_2 emissions. 200 devices running for 130 years would remove only 5 % of the world's floating plastics.

Seafloor Clean-Up Technologies:

- Autonomous underwater vehicles and robotic systems are being developed to remove plastics from the seafloor, but they are expensive, complex, and unlikely to scale efficiently.
- Trawling for plastics, like bottom fishing, causes severe habitat destruction and high bycatch mortality.
- Fishing-for-Litter initiatives encourage fisherfolk to collect plastics caught in their nets, offering a low-cost and community-driven approach.

Link:

- SPREP: **Plastic Removal Technologies 101 – Factsheet**

Further Reading:

→ PROMAR (2021): **Practical guide for organizing and carrying out beach cleanups**

→ CETMAR (2025): **Free LitterAT Toolkit: Towards Litter-Free Coastal Communities**

→ GIZ (2024): **Position Paper Abandoned, Lost or Otherwise Discarded Fishing Gear**

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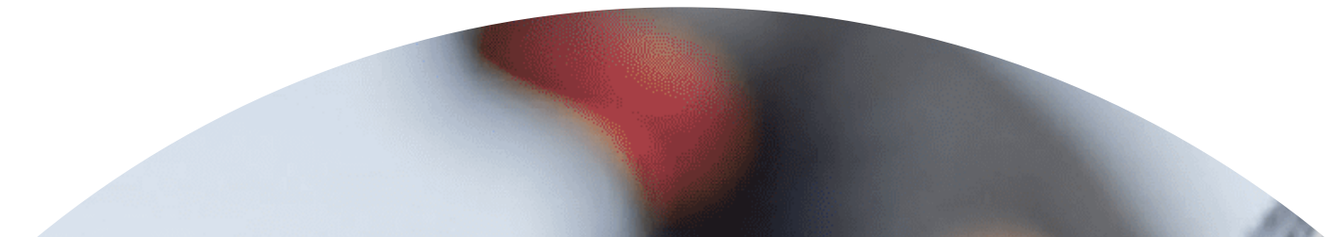

Annex

1 – 12

No\.	Case	Section	Region/Country	Measure Category
1	**National Action Plan on Marine Litter, Philippines**	National Plans	Philippines	—
2	**National Action Plan on Marine Litter, Viet Nam**	National Plans	Viet Nam	—
3	**Global Plastic Action Partnership & National Plastic Action Partnership Model (WEF)**	National Plans	Global/Selected	—
4	**Transnational and Regional Action Plans**	National Plans	Multi-Region	—
5	**EU Marine Strategy Framework Directive**	Baselining and monitoring	EU	—
6	**National Baseline Survey on Marine Litter, Lebanon**	Baselining and monitoring	Lebanon	—
7	**Establishing National Baselines through the GPAP Framework**	Baselining and monitoring	Global/Selected	—
8	**Data Generation through Citizen Science**	Baselining and monitoring	Global/Various	—
9	**Advancing Unified Monitoring through Communities of Practice**	Baselining and monitoring	Global	—
10	**DRS for Beverage Containers, Germany**	Financing	Germany	—
11	**Circulate Capital: Mobilising Investment for Plastics Circularity**	Financing	Global/Asia	—
12	**City of Cape Town: Pioneering Municipal Green Bonds in Africa**	Financing	South Africa	—

No\.	Case	Section	Region/Country	Measure Category
13	Caribbean Biodiversity Fund's Facility for Advancing Circular Economy	Financing	Caribbean	—
14	Morocco's Plastic Bag Ban: Supporting Industry Transition	Just transition	Morocco	—
15	Waste Picker Integration Guidelines and Registration System, South Africa	Just transition	South Africa	—
16	Incentivising Coastal Clean-Up through Waste Valorisation, Mozambique	Just transition	Mozambique	—
17	Inclusion and Fair Payment of Waste Pickers in Bogota, Colombia	Just transition	Colombia	—
18	Formal Inclusion of Waste Pickers in EPR Systems: Chile & Brazil	Just transition	Chile, Brazil	—
19	International Frameworks for Regulating Chemicals of Concern	Chemicals and polymers of concern	International	Regulatory
20	EU REACH Regulation Limiting Chemical Use	Chemicals and polymers of concern	EU	Regulatory
21	EU Ban on Bisphenol-A (BPA)	Chemicals and polymers of concern	EU	Regulatory
22	Comprehensive Food Contact Material Regulation, Indonesia	Chemicals and polymers of concern	Indonesia	Regulatory
23	Eco-Design Standards and Requirements in Thailand	Chemicals and polymers of concern	Thailand	Regulatory

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No\.	Case	Section	Region/Country	Measure Category
24	**International Sustainable Chemistry Collaborative Centre (ISC3)**	Chemicals and polymers of concern	International	Collaboration and voluntary agreements
25	**EU Regulations on Microplastics**	Problematic, unnecessary and avoidable plastics	EU	Regulatory
26	**Regulating SUPs and Promoting Alternatives in Saint Lucia**	Problematic, unnecessary and avoidable plastics	Saint Lucia	Regulatory
27	**The UK Plastics Pact and Its Global Influence**	Problematic, unnecessary and avoidable plastics	UK/Global	Collaboration and voluntary agreements
28	**The Singapore Packaging Agreement**	Problematic, unnecessary and avoidable plastics	Singapore	Regulatory
29	**PVC Labels Ban for Beverage Containers, Seychelles**	Product design, composition and performance	Seychelles	Regulatory
30	**Eco-Design Requirements in the EU SUP Directive & Eco-Design for Sustainable Products Regulation**	Product design, composition and performance	EU	Regulatory
31	**Tax on Packaging Without Recycled Content in the UK**	Product design, composition and performance	UK	Economic and fiscal instruments
32	**Voluntary Design for Recycling Workplan by Circular Plastics Alliance**	Product design, composition and performance	EU	Collaboration and voluntary agreements
33	**New Plastics Economy Global Commitment**	Product design, composition and performance	Global	Collaboration and voluntary agreements
34	**LCA on Single-Use Plastics Bags and Food Containers, Singapore**	Alternative systems and products	Singapore	Standards and requirements

No\.	Case	Section	Region/Country	Measure Category
35	**LCA Results for Four Pilot Projects during the SUP Challenge in Southeast Asia**	Alternative systems and products	Southeast Asia	Awareness
36	**EU Directive on Empowering Consumers for the Green Transition**	Alternative systems and products	EU	Regulatory
37	**Standardisation Process in the EU for Compostable and Biodegradable Products**	Alternative systems and products	EU	Regulatory
38	**DRS and Reuse as Part of the German Packaging Act**	Alternative systems and products	Germany	Regulatory
39	**Netherlands Green Deals**	Alternative systems and products	Netherlands	Regulatory
40	**Green Procurement for the XVI Pacific Games in Samoa**	Alternative systems and products	Samoa	Regulatory
41	**Landfill Restrictions and Variable PAYT Fee Systems in Germany**	Alternative systems and products	Germany	Regulatory
42	**Extending Collection Services with Operator Models in Maputo, Mozambique**	Waste management and recycling	Mozambique	Services and Infrastructure
43	**Solid Waste Management Legislation in the Philippines**	Waste management and recycling	Philippines	Regulatory
44	**"No Segregation No Collection" Waste Management Policy, San Fernando, Philippines**	Waste management and recycling	Philippines	Regulatory
45	**Clusters of Municipalities for Joint Waste Disposal, Thailand**	Waste management and recycling	Thailand	Services and infrastructure

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No\.	Case	Section	Region/Country	Measure Category
46	**Kosovo Municipal Performance Grant for Clean Environment**	Waste management and recycling	Kosovo	Economic and fiscal instruments
47	**Marine Litter Descriptor for Good Environmental Status under EU MSFD**	Existing plastic pollution	EU	Regulatory
48	**Economic and Fiscal Tools for Funding Clean-Ups in Europe**	Existing plastic pollution	Europe	Economic and fiscal instruments
49	**World Cleanup Day**	Existing plastic pollution	Global	Collaboration and voluntary agreements
50	**Financial Support Programmes for Removal of Fishing Gear and Marine Litter**	Existing plastic pollution	Global	Economic and fiscal instruments

No\.	Tool	Section	Tool Category	Measure Category
1	Guidance and Resources for Developing National Action Plans on Plastic and Marine Litter	National Plans	Guideline Overview	—
2	Overview of Tools for Assessing Plastic Pollution	Baselining and monitoring	Tool Overview	—
3	RecoTrace – Plastic Recycling Tracking System in Europe	Baselining and monitoring	Private Sector Tool	—
4	Key Performance Indicators for Monitoring Plastics wcross the Lifecycle	Baselining and monitoring	Guideline Overview	—
5	PREVENT Waste Alliance EPR Toolbox and the Global Action Partnership for EPR	Financing	Tool and Support Framework	—
6	The Plastics Circularity Investment Tracker – Mapping Private Capital Flows	Financing	Tool	—
7	Climate Bonds Initiative – Waste Management Criteria	Financing	Guideline	—
8	Enabling Just and Inclusive Circular Transitions – Recommendations for Business, Finance, and Policy	Just Transition	Guideline	—
9	InteRa Framework: Guiding Inclusive Waste and Resource Management	Just Transition	Tool	—
10	Awareness and Capacity-Building for Women of the Informal Recycling Sector Toolkit for Facilitators	Just Transition	Tool	—
11	South Africa's 7-Step Approach to Waste Picker Integration	Just Transition	Guideline	—
12	SCIP Database: Enhancing Transparency on Substances of Very High Concern (SVHCs) in Products	Chemicals and polymers of concern	Tool	Regulatory

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No\.	Tool	Section	Tool Category	Measure Category
13	ChemSelect Tool for Sustainability Assessment of Chemicals and Mixtures	Chemicals and polymers of concern	Tool	Awareness
14	OECD Resources and Toolboxes on Chemicals Management and Plastic	Chemicals and polymers of concern	Guideline and tool overview	Multiple
15	Applying Global Criteria to Identify and Manage Problematic Plastics: Insights from the Nordic Council of Ministers	Problematic, unnecessary and avoidable plastics	Guideline	Regulatory
16	OECD Working Paper on Eco-Modulated EPR	Product design, composition and performance	Guideline	Financing
17	PREVENT Waste Alliance Common Criteria and Practical Design Guide to Improve Design for Recycling of Plastic Packaging	Product design, composition and performance	Guideline	Regulatory
18	Info Box on Different Types of Bioplastics	Alternative systems and products	Factsheet	Awareness
19	The Life Cycle Initiative Criteria for the Evaluation of LCAs	Alternative systems and products	Guideline	Regulatory
20	Waste Management Hierarchies	Waste management and recycling	Guideline	Regulatory
21	Basel Technical Guidelines on the Environmentally Sound Management of Plastic Wastes	Waste management and recycling	Guideline	Regulatory
22	Characterising Current Waste Management Performance against the Nine Development Bands and WaCT Ladders of Control	Waste management and recycling	Guideline	Services and infrastructure
23	GIZ Guidance Paper on ISWM Operator Models	Waste management and recycling	Guideline	Services and infrastructure
24	SPREP Factsheet – Plastic Removal Technologies	Existing plastic pollution	Factsheet	Services and infrastructure

A – M

ALDFG	Abandoned, Lost, or otherwise Discarded Fishing Gear
ARB	Recycler Association of Bogota
BMZ	German Federal Ministry for Economic Cooperation and Development
BPA	Bisphenol A
BPOM	Indonesian National Agency of Drug and Food Control
CEN	European Committee for Standardisation
CPA	Circular Plastics Alliance
DPP	Digital Product Passport
DRS	Deposit Refund System
ECHA	European Chemicals Agency
EPR	Extended Producer Responsibility
EU	European Union
EU REACH	European Union Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals
FCM	Food Contact Material
GAP for EPR	Global Action Partnership for Extended Producer Responsibility
GFC	Global Framework for Chemicals
GHG	Greenhouse Gas
GIZ	German Corporation for International Cooperation
GPAP	Global Plastic Action Partnership
GPML	Global Partnership on Plastic Pollution and Marine Litter
HS	Harmonized System
INC	Intergovernmental Negotiating Committee
InteRa	Integration Radar
IUCN	International Union for Conservation of Nature
ISC3	International Sustainable Chemistry Collaborative Centre
ISO	International Organisation for Standardization
ISWA	International Solid Waste Association
ISWM	Integrated Sustainable Waste Management
KPI	Key Performance Indicator
LCA	Life Cycle Assessment
MEA	Multilateral Environmental Agreement
MRF	Mechanical Recovery Facility

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d End-of-Life Management

M – W

MSFD	EU Marine Strategy Framework Directive
MSW	Municipal Solid Waste
NAP	National Action Plan
NGO	Non-Governmental Organisation
NPAP	National Plastic Action Partnership
OECD	Organisation for Economic Cooperation and Development
PAYT	Pay-As-You-Throw
PDCA	Plan-Do-Check-Act
PET	Polyethylene terephthalate
POPs	Persistent Organic Pollutants
PRO	Producer Responsibility Organisation
PTAT	Plastics Treaty Assist Toolkit
PUA	Problematic, Unnecessary and Avoidable
PVC	Polyvinyl chloride
SAWPRS	South Africa Waste Picker Registration System
SCIP	Substances of Concern In articles as such or in complex objects (Products)
SDG	Sustainable Development Goal
SIDS	Small Islands Development State
SPA	Singapore Packaging Agreement
SPREP	Secretariat of the Pacific Regional Environment Programme
SPOT	Spatio-temporal quantification of Plastic pollution Origins and Transportation model tool
SUP	Single-Use Plastic
SVHCs	Substances of Very High Concern
SWM	Solid Waste Management
UBA	German Federal Environment Agency
UK	United Kingdom
UN	United Nations
UNEA	United Nations Environment Assembly
UNEP	United Nations Environmental Program
WaCT	Waste Wise Cities Tool
WFD	Waste Flow Diagram
WWF	World Wide Fund for Nature

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