

EPR Toolbox | Extended Producer Responsibility

Training of Trainers (ToT)



About the Extended Producer Responsibility Toolbox

Marine plastic pollution is a significant environmental issue, with approximately 14 million tons of plastic entering oceans annually, threatening ecosystems, tourism and human health.

Extended Producer Responsibility (EPR) is a policy approach aimed at reducing packaging waste and preventing pollution, supporting the transition to a circular economy. This interactive training will provide an introduction to EPR concepts and key components of EPR systems. Additionally, it serves as a practical guide for implementing EPR, with a focus on its application in the Global South.

The 6 EPR toolkit modules

Module 1: Understanding the problem of marine pollution and how Extended Producer Responsibility can help for a Circular Economy

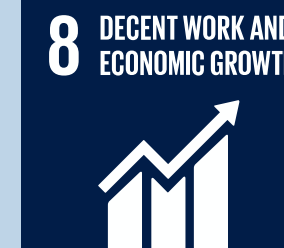
Module 2: Introduction to EPR Basics

Module 3: Design options of EPR systems

Module 4: What are complementary measures to EPR systems and how do they work?

Module 5: Institutional Implementation

Module 6: Case Studies



When to Use the EPR Toolbox?

The EPR Toolbox is designed as a training resource and practical guide for enabling Extended Producer Responsibility (EPR).

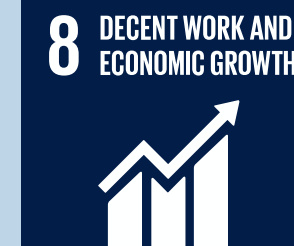
Use this resource to:



- **Understand the challenge** – how marine plastic pollution affects ecosystems, economies, and human health.
- **Learn EPR fundamentals** – key concepts, design options, and complementary measures.
- **Strengthen institutions** – explore governance, monitoring, financing, and stakeholder engagement.
- **Draw lessons from practice** – review case studies from countries implementing EPR.

Who is it for?

- Policymakers and regulators designing or strengthening EPR systems.
- Producer Responsibility Organisations (PROs) and businesses with EPR obligations.
- Trainers, NGOs, and academia conducting Training of Trainers (ToT) and awareness raising.
- Development partners supporting circular economy transitions.



Content | Overview

Module 1: Understanding the problem of marine pollution and how EPR can help for a Circular Economy

- What are consequences of marine plastic pollution?
- How can EPR address these problems?
- Country-Specific information
- Didactics

1

Module 2: Introduction to EPR Basics

- Principles and Essentials of EPR
- Organization of waste management in an EPR scheme
- Preconditions and Needs
- What is not an EPR system?
- Didactics

2

Module 3: Design options of EPR Systems

- EPR Design Options
- Organization of WMS
- Mandatory vs. voluntary system
- Individual vs. collective system
- PRO Design Options
- Didactics

3

Module 4: What are complementary measures to EPR systems and how do they work?

- Regulatory policies
- Economic / market-based instruments
- Information, communication and education
- Didactics

4

Module 5: Institutional Implementation

- Institutional set-up
- Stakeholder engagement and management
- Integration of informal sector
- Financial flows
- Supervision, monitoring and enforcement
- Didactics

5

Module 6: Case Studies

- Global South Context
- Philippines
- Indonesia
- Malaysia
- Dominican Republic
- Kiribati
- Palau
- South Africa
- Germany
- South Korea
- Vanuatu

6



Module 1

**Understanding the Problem of Marine
Pollution and how Extended Producer
Responsibility can help**



Worksheet Beginning Module 1

What do you know about marine litter?

Add everything that comes to your mind when thinking about marine litter

What are the effect of Marine Litter?

Write down the environmental, social and economic effects of marine litter.

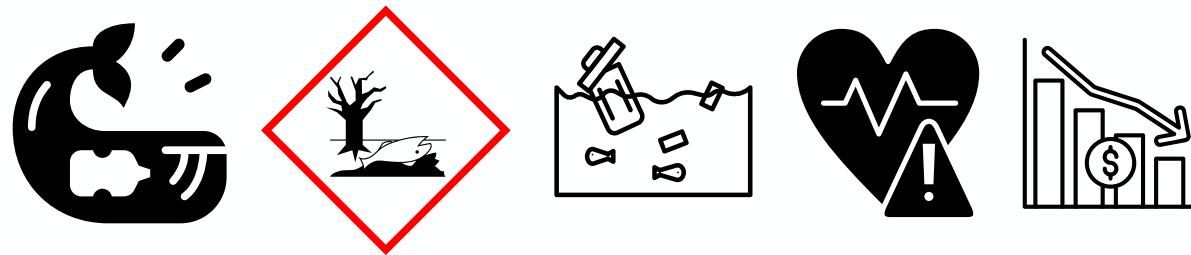
Problems caused by plastic packaging

Write down problems directly connected to plastic pollution in the marine environment.

Background

What do you know about marine litter and its effects? Which problems are caused by (plastic) packaging and its disposal?

Overview of Marine Pollution: Marine plastic pollution is human-made plastic waste in oceans and coastal areas. Its slow degradation and increasing disposal lead to more marine litter, threatening ecosystems, human health, and aquatic life.



Approximately 14 million tons of plastic enter oceans annually, harming marine life and ecosystems. Single-use plastics and poor waste management are key contributors, with billions lacking proper waste services, worsening pollution.

Regional Focus - Caribbean: The Caribbean faces significant challenges due to its reliance on tourism and fishing. Countries like Antigua and Barbuda, Belize, and Saint Lucia have implemented bans on single-use plastics to combat pollution.



Role of EPR in a Circular Economy

How does EPR support a circular economy?

Shift responsibility to consumers

Ignore waste management

Promote disposable products

Encourages sustainable design and recycling

Absenden

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What is a key organizational responsibility in waste management?

Educate the public on proper disposal

Fund Take-Back Programs for recycling

Invest in waste management facilities.

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How can Small Island Developing States (SIDS) improve waste management systems?

Exclude informal workers from waste systems.

Involve informal waste workers in formal systems.

Focus solely on international experts for management.

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Marine Litter – Why we need to act now and how to do it

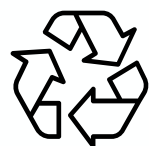


Video Link:

<https://www.youtube.com/watch?v=MAkC7309ILM>



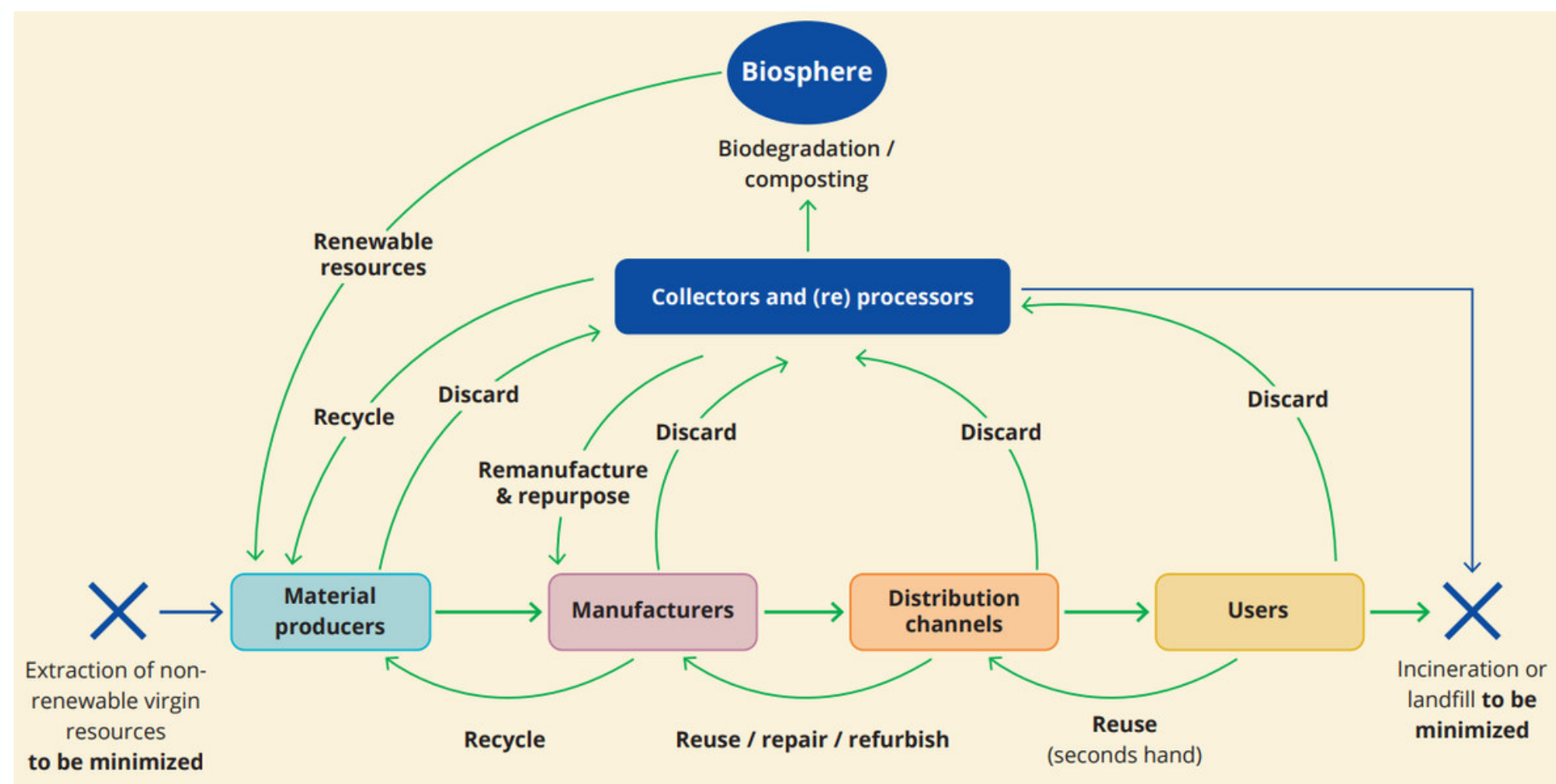
What is Circular Economy (CE)?



Minimize value destruction and encourage value retention or creation across the value chain.



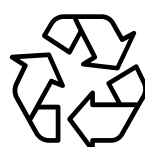
Retention of resource value means conserving resources in as close as possible to their original state



Source: CTI (2023): <https://www.wbcsd.org/contentwbc/download/16345/233646/1>

How can EPR help

EPR plays a crucial role in the Circular Economy because it:



Encourages producers to **create recyclable products and minimise waste.**



Improves waste management through **enhanced collection and recycling infrastructure.**



Engages stakeholders, including governments and businesses, to **foster collaboration in waste management solutions.**

EPR **supports a circular economy by making producers responsible for the entire lifecycle** of their products, encouraging sustainable design, efficient waste management, and increased recycling.

Financial Responsibilities:

- Fund Take-Back Programs for recycling/disposal.
- Support waste management infrastructure improvement.

Organizational Responsibilities:

- Organize and fund waste collection and treatment.
- Invest in waste management facilities.

Informative Responsibilities:

- Educate the public on proper disposal.
- Report waste management data and implement best practices.

Challenges in SIDS

1

There is a **lack of innovation and infrastructure**, with technologies for improving **waste management** either **unavailable or unsuitable**.

2

The **financial resources** required to operate and enhance waste management systems are **extraordinarily high and may even be prohibitively expensive**.

3

Public institutions responsible for statistics and resource management often operate **inefficiently, resulting in poor-quality and inaccurate data acquisition systems**. However, the efficient implementation of EPR programs requires a robust and **reliable data collection system**.

4

Governance, monitoring, and **enforcement capacities** are often **inadequate or entirely lacking**. In many SIDS, foundational systems such as **licensing, certification, or permitting schemes** in the waste management sector, essential for establishing and supporting an effective EPR scheme, are frequently incomplete or absent.



DIDACTICS

Where are we at now?

1. How is the Waste Management System (WMS) in your country?
What are the primary challenges from your stakeholder perspective?
2. What role does your stakeholder group play in advancing Extended Producer Responsibility (EPR) and Circular Economy (CE) initiatives

Country-Specific Background:



Module 1

Worksheet End of Module 1

How is the waste management system in your country?

Write down how developed the infrastructure for waste management in your country is

What roles does your stakeholder group play in supporting EPR and Circular Economy initiatives?

Describe your group responsibilities, influence, and contributions to EPR/CE

What are the primary challenges from your perspective

Focus on the challenges which affect you as a stakeholder.

DIDACTICS

Where are we at now?

EPR can reduce marine pollution by holding producers accountable for their products' lifecycle, encouraging recycling and sustainable design to support a Circular Economy.

Let's check out some more details about EPR in the next modules!



Module 2: Introduction to EPR Basics



Module 2

Introduction to the concept of Extended Producer Responsibility



Definition and components

EPR is a **policy approach** that **assigns producers responsibility** for their products throughout the **entire lifecycle**, including post-consumer stages. The **effectiveness of EPR systems** heavily **depends** on clearly **defined roles and responsibilities** among stakeholders. EPR systems need to be **country-specific and supported by evidence-based knowledge**.



Key Components of EPR:

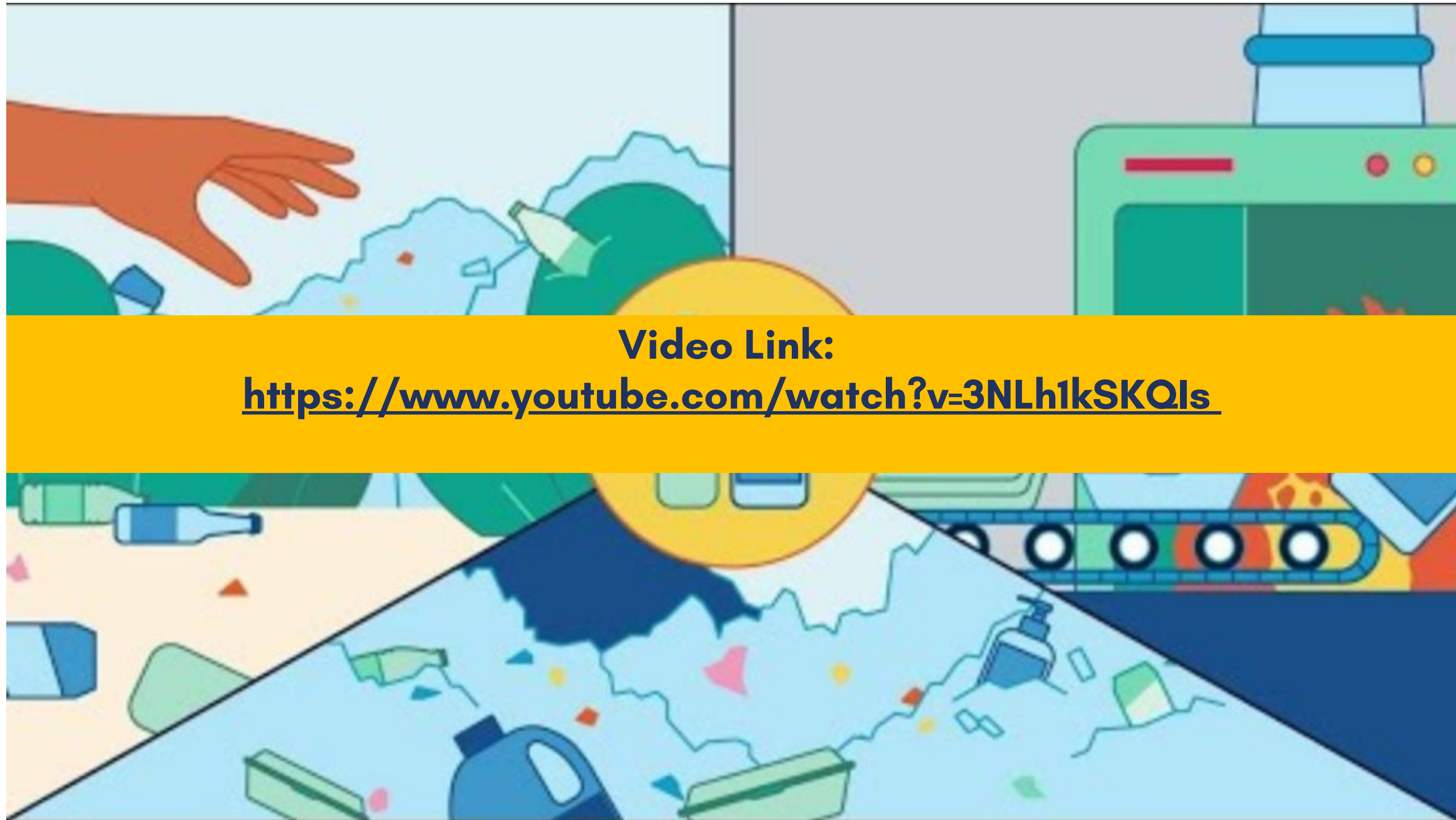
1. **Financial responsibilities** for recycling and waste management infrastructure
2. **Organizational responsibilities** for waste collection and processing
3. **Informative responsibilities** for public awareness and best practices



Role of EPR in Circular Economy:

Promotes **sustainable practices** by incentivizing **recycling-friendly product** designs and **improves waste management** infrastructure to prevent environmental leakage.

What is EPR?



Video Link:

<https://www.youtube.com/watch?v=3NLh1kSKQIs>

Objectives and benefits

Extended Producer Responsibility (EPR) is an environmental policy approach mandating producers to manage their products post-consumer stage, as defined by the OECD in 2016.

Polluter Pays Principle: Shifts responsibility and financial costs of environmental externalities to producers.

Circular Economy Facilitation: Encourages recycling and waste management to support a sustainable economy.



Objectives of EPR:

- Reduce the use of virgin resources
- Prevent waste generation
- Lower the environmental impact of products throughout their lifecycle

Benefits of EPR Systems:

- Reduces landfill waste and pollution
- Creates job opportunities in waste collection and recycling sectors
- Lowers financial burdens on local governments
- Incentivizes eco-design
- Supports the recycling industry
- Enhances tourism

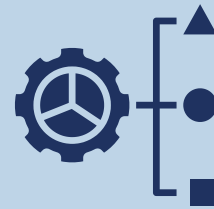
What EPR Is Not:

- **Traditional Waste Collection and Disposal Services** – Managed by municipalities with costs on taxpayers, but can support EPR through collaboration with PROs or shared infrastructure.
- **Voluntary Recycling Programs** – Publicly driven initiatives without mandatory producer responsibility, yet they can complement EPR via collection points and awareness efforts.
- **Deposit-Refund Schemes (DRS)** – Refundable deposit systems run by governments or private entities, but can integrate into EPR by involving producers or targeting specific waste streams.

Principles and Essentials of EPR

Stakeholder responsibilities vary based on:

- Country-specific institutional frameworks
- Types of waste involved
- Structural conditions of the system



Integration with broader policies:

- EPR systems must align with overall waste management strategies
- They should complement circular economy policies



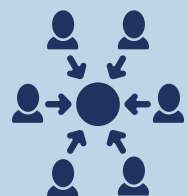
Financing mechanism:

- Producers or importers pay fees when introducing packaged goods into the market
- These fees fund the implementation of the EPR program, covering costs such as administration, enforcement, and waste management infrastructure upgrades



Allocation of responsibilities:

- Typically involves multiple stakeholders, including producers, government agencies, and waste management operators
- Responsibilities may include reporting data, paying fees, and managing waste collection and treatment



Tailor specific waste streams



Identify Waste Characteristics:

- Determine if the waste stream is suitable for EPR. For example, packaging waste, electronic waste, portable batteries, and cars are often introduced to the market by identifiable producers, making them suitable for EPR systems.
- Residual or organic waste, for which no single producer can be held responsible, is generally unsuitable for EPR implementation.



Adapt to Country-Specific Circumstances:

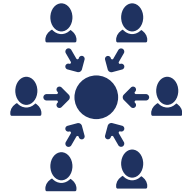
- Consider the institutional landscape, structural conditions, and existing waste management frameworks in the country.
- Ensure integration with broader circular economy and waste management policies.



Define Stakeholder Roles:

- Engage key stakeholders such as producers, importers, distributors, retailers, consumers, waste management companies, local authorities, and government bodies.
- Clearly allocate responsibilities for collection, sorting, recycling, and monitoring based on the specific waste stream.

Challenges in the implementation



- **Organizational Challenges**

Clear allocation of responsibilities among stakeholders.
Integration with existing waste management and circular economy frameworks.



- **Financial Challenges**

Determining appropriate fee structures for producers and importers.
Ensuring stable long-term financing.



- **Implementation Challenges**

Creating a fair system that doesn't impact market competition.
Tailoring EPR systems to specific waste streams and country circumstances.
Integrating informal waste sectors in some countries.



- **Legal and Regulatory Challenges**

Developing and enforcing appropriate legal frameworks.
Effective monitoring and supervision of the EPR system.

Addressing these challenges requires **careful planning, stakeholder engagement, and ongoing evaluation** and adjustment of the EPR system to ensure its effectiveness in achieving environmental and economic goals.



DIDACTICS

Challenges

Country-Specific Adaptation:



Identify Waste Characteristics



Adapt to Country-Specific Circumstances



Define Stakeholders

Worksheet Module 2

Which waste streams are most suitable for an EPR system in your country?

Select waste types that are problematic, high in volume, or valuable for recovery.

Can your country's current system manage these waste streams?

Assess infrastructure, capacity, and enforcement in your context..

Who are the key stakeholders to involve in managing these waste streams?

Identify producers, regulators, collectors, recyclers, and influencers.

What factors could help or hinder implementing EPR for these streams?

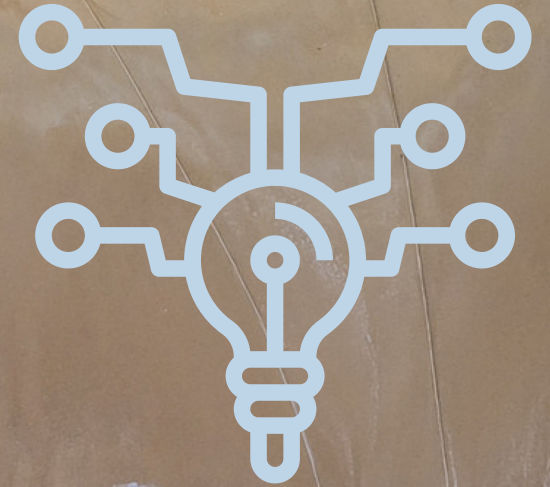
Consider policy gaps, funding, technical limits, and public awareness.

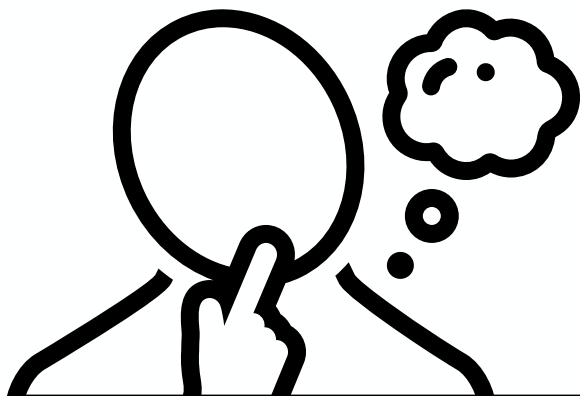


Module

3

Design Options of EPR Systems





Design Options for EPR

What is the most important first step in designing an EPR system?

Clearly defining objectives in regard to product scope, type (mandatory or voluntary, etc.)

Setting targets for waste collection and recycling

Identifying the producers involved

Establishing enforcement mechanisms

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What is the biggest challenge for implementing an EPR system in SIDS?

Lack of stakeholder interest

Geographic isolation and limited infrastructure

Lack of legal frameworks

Low levels of public awareness

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Which stakeholder group is the most critical for the success of an EPR system in SIDS?

Local government

Producers and importers

Waste collection companies

Community groups and NGOs

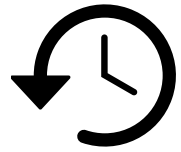
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Organization of waste management in an EPR scheme

Design element	Description	Note
System Scope		
Product definition	The product(s) to be covered by EPR must be clearly defined.	Definitions should include the type of product, categories/sub-categories if appropriate, materials, and type of consumer (e.g., household and/or commercial/business waste).
Producer definition and registration	All affected producers should be registered and treated equally.	All producers should face the same requirements/obligations , whilst not adversely affecting small and medium-sized enterprises (SME).
Mandatory vs. Voluntary	Defines whether the EPR scheme is enforced by law or adopted voluntarily by producers.	Mandatory schemes are legally binding and require compliance, while voluntary schemes are typically industry-led and may offer flexibility in implementation.
Individual vs. collective schemes	Schemes can be either individual producer responsibility (IPR) or collective producer responsibility (CPR).	There may be one single collective scheme or competing schemes. IPR: Individual producers take responsibility for their products – direct link between producer and waste management CPR: Producers join a collective producer responsibility organization (PRO) that takes on the responsibility of all its members. Collective schemes tend to be more efficient and cost-effective (due to pooled resources, economies of scale, etc.)

Product Definition



Historically, EPR schemes have targeted specific product sectors rather than materials like plastics.



EPR schemes have evolved from beverage container deposits in the 1970s to broader packaging and electronic directives by the 2000s.



Legal Framework:

- Must clearly define covered packaging types and materials (e.g., plastics, paper, metals).
- Specify whether all or selected material fractions are included at the start.
- Particularly relevant for regions with limited waste management capacities, like Small Island Developing States (SIDS).

Plastic Waste Focus:

- Often the starting point for EPR, especially in SIDS.
- Schemes should progressively increase market shares for reusable and recyclable plastics.

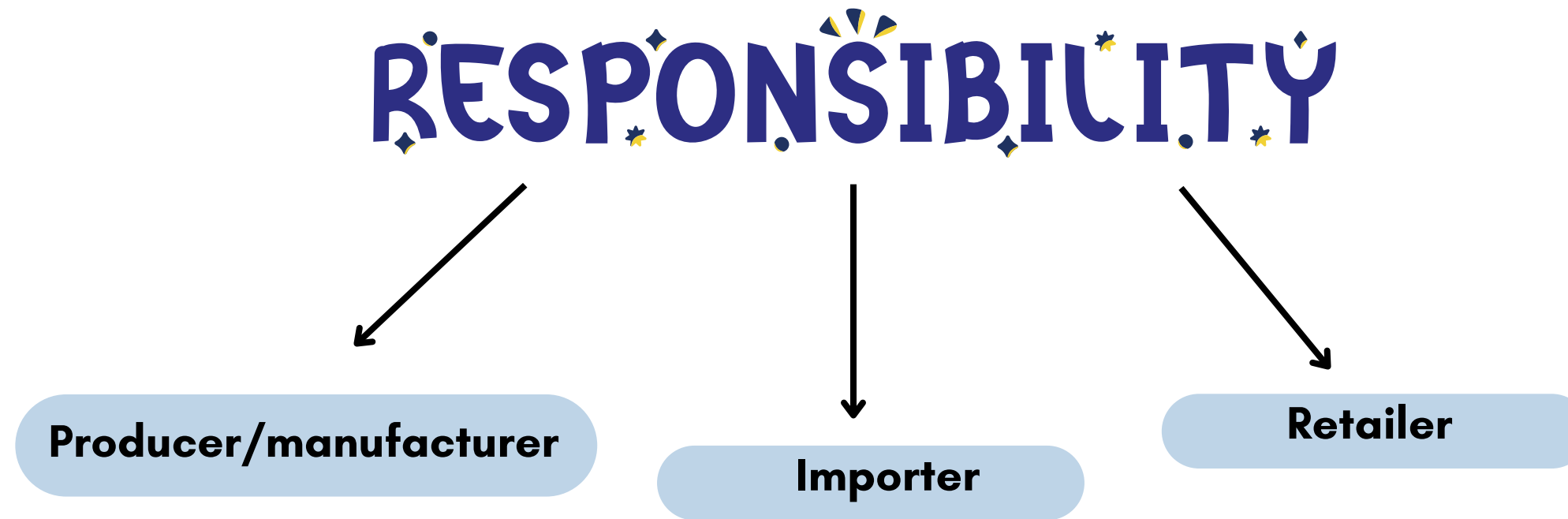
Implication for SIDS

The EPR scheme should initially cover plastic and plastic products that have a positive market value and are easy to recycle and then increase its coverage over time

In view of the limited and often insufficient capacities of existing waste management systems in SIDS, an EPR scheme that initially covers only certain types of plastics and plastic products and then gradually increases its coverage over time is certainly the preferred option. Such an approach also gives more time to gradually expand and upgrade waste management systems while already generating financial resources for the necessary investments. If this approach is chosen in SIDS, it is, however, important to adopt measures that integrate the informal waste workers from the very start of the EPR scheme's operation.



Producer Definition



Producer's (*mostly used as term for all the 3 groups above) Responsibilities:

- Must meet government-set targets and responsibilities.
- Involves establishing and managing EPR schemes, potentially through Producer Responsibility Organisations (PROs).
- Tasks include scheme operations, fee management, and collaboration with waste collectors and processors.

Mandatory vs. Voluntary

Aspects influencing the different systems

Aspect	Mandatory System	Voluntary System
Compliance	All producers required to participate	Participation based on individual interest
Infrastructure	Comprehensive waste management system	Limited and inconsistent coverage
Financial Sustainability	Reliable long-term funding	Uncertain financial stability
Enforcement	Strong legal mechanisms	Weak monitoring and enforcement

Individual versus collective - Background on Producer Responsibility Organization (PRO)

A Producer Responsibility Organization (PRO) is an **entity that manages EPR obligations on behalf of producers** in a collective EPR system. It helps ensure compliance with regulations by organizing collection, recycling, and proper disposal of products.



Collective Systems

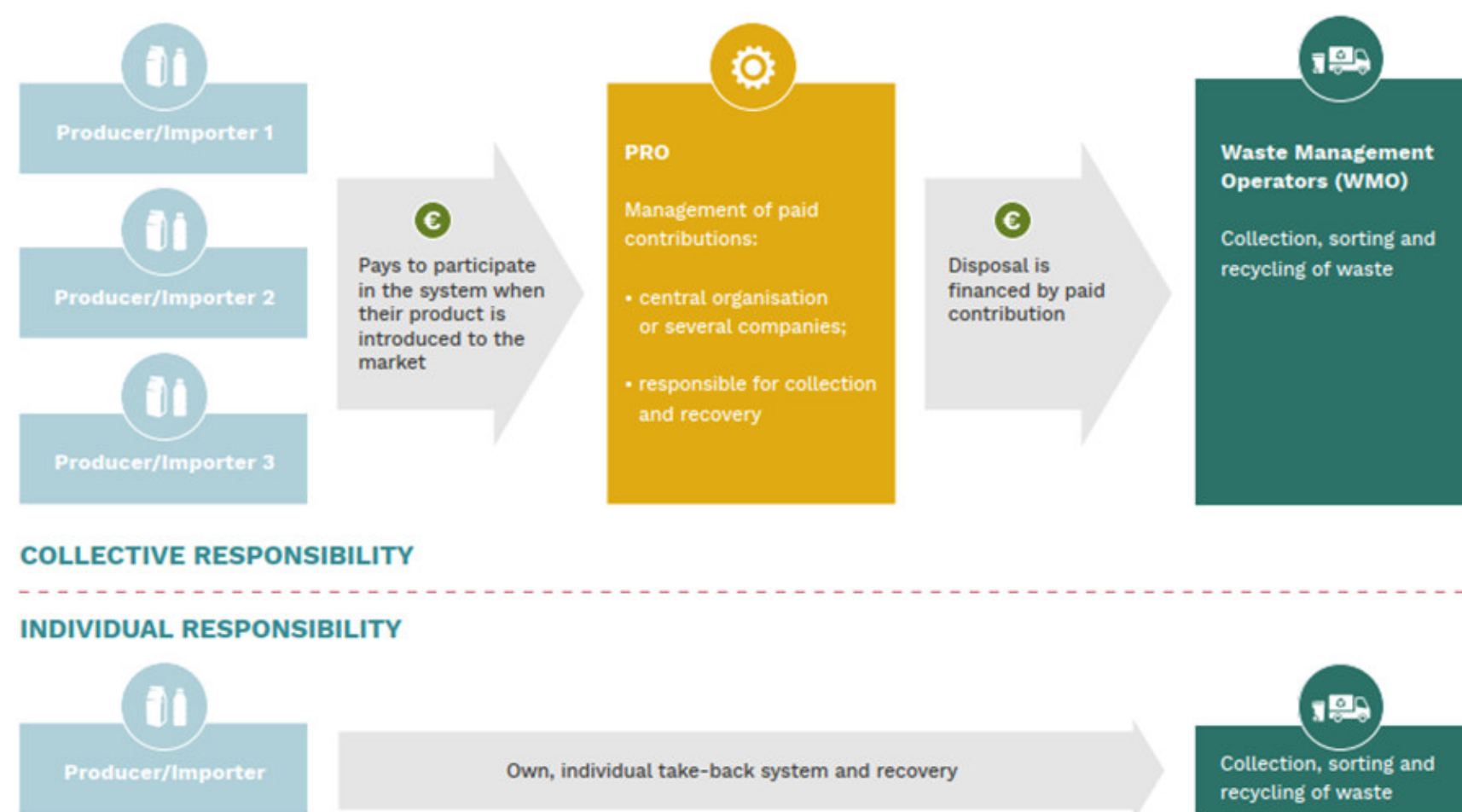
Key Functions of a PRO in EPR:

- Acts as an **intermediary** between producers and waste management
- **Collects fees** from producers for recycling
- **Coordinates waste** collection, sorting, and recycling
- **Ensures compliance** with EPR regulations
- **Promotes eco-design** for recyclable products
- Engages in **public awareness campaigns** for better waste management.

Benefits

- **Efficiency** – **Centralized management** reduces the burden on individual producers.
- **Cost-Effectiveness** – **Shared costs among producers** lower financial strain.
- **Higher Recycling Rates** – Structured collection and processing improve waste recovery.
- **Regulatory Compliance** – Helps businesses **meet legal EPR requirements**.
- **Environmental Impact** – Supports **circular economy** and **reduces landfill waste**.

Individual vs. collective system



Source: Prevent Waste Alliance (2024), https://prevent-waste.net/wp-content/uploads/2024/03/PREVENT-Toolbox-interactivePDF_2024.pdf



Design a Suitable EPR Scheme:

- **Choose between individual or collective EPR schemes** depending on the nature of the waste stream and producer capabilities.

Individual vs. collective system

Comparison between the 2 systems



Individual EPR

- Producers manage waste directly
- Best for industrial packaging waste
- Requires detailed waste tracking



Collective EPR

- Managed by Producer Responsibility Organizations (PROs)
- More efficient for household waste
- Generates economies of scale
- Reduces administrative burden

Practical Example: Nordic Plastic Waste Initiative

- Developing innovative business models for plastic and textile waste
- Aims to create sustainable supply chains
- Exploring region-wide EPR models
- Promoting eco-design through research collaborations

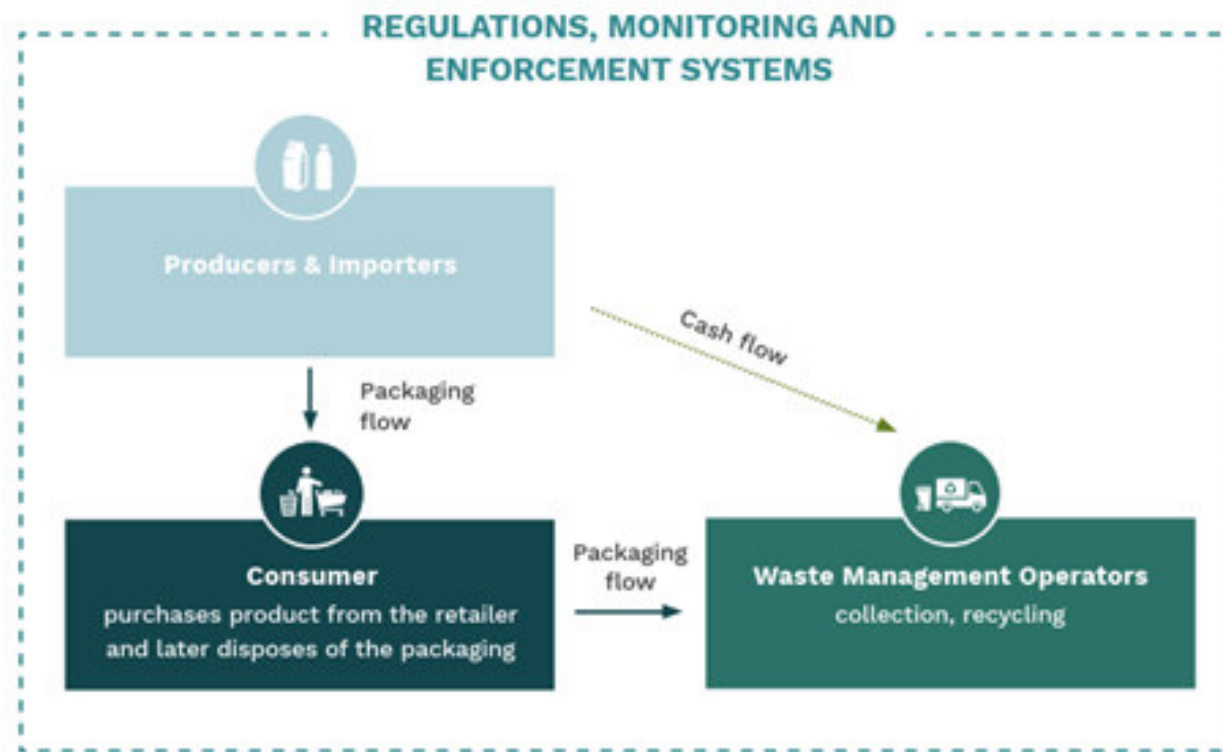
Source: <https://www.norden.org/en/publication/epr-systems-and-new-business-models-0>

Individual vs. collective system

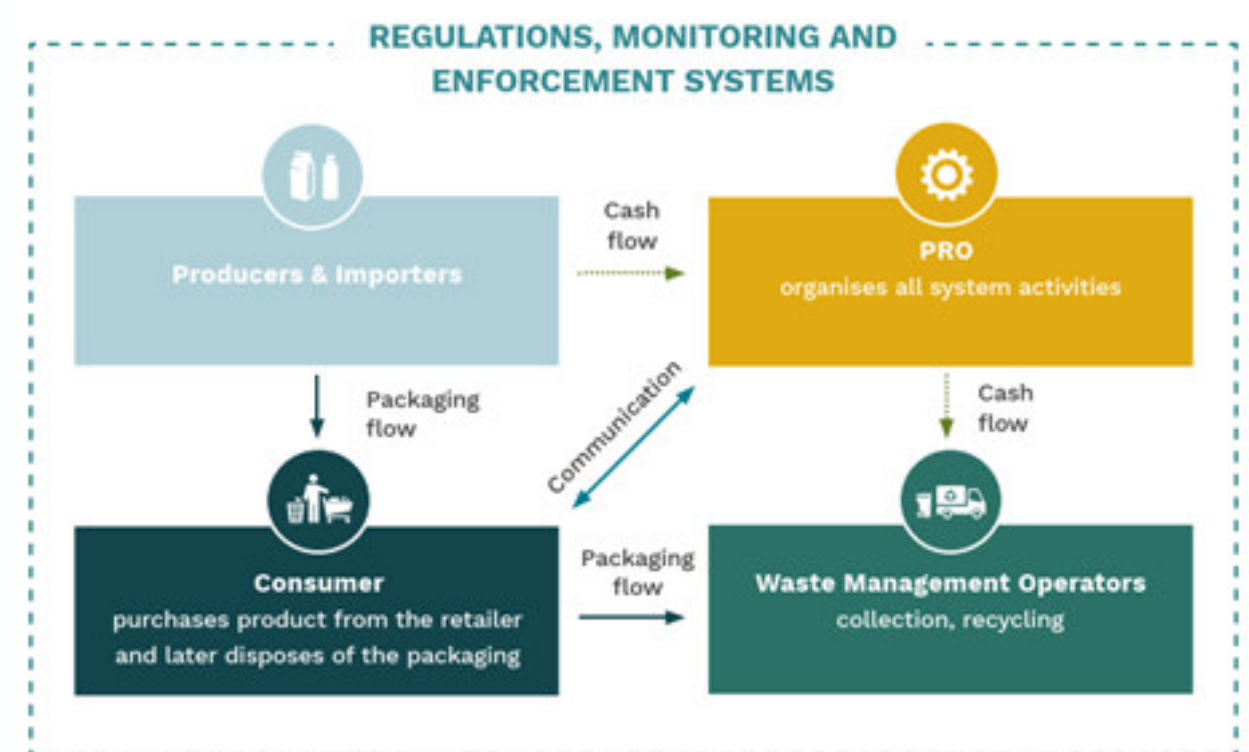
Comparison between the 2 systems



Individual EPR



Collective EPR



Source: Prevent Waste Alliance (2024), https://prevent-waste.net/wp-content/uploads/2024/03/PREVENT-Toolbox-interactivePDF_2024.pdf

How Does A PRO Work?





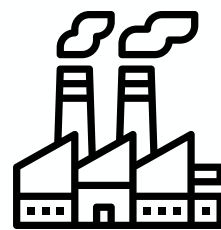
Video Link:
<https://www.youtube.com/watch?v=h0gaP3NVZNM>

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PRO design options: Materials

EPR systems can be designed to cover either **all materials or selected materials**, each approach having distinct advantages and challenges. The choice between all materials or selected materials depends on factors such as:

- Existing waste management infrastructure
- Political and economic feasibility
- Environmental priorities
- Industry readiness and capacity



Aspect	All Materials	Selected Materials
Coverage	Comprehensive waste stream management	Focus on specific priority materials
Implementation	More complex initially	Easier to implement and manage
Environmental Impact	Maximizes overall impact	Addresses most pressing concerns first
Cost	Higher overall system costs	Potentially lower initial costs
Consumer Education	Simpler, uniform approach	May require material-specific education
Material Substitution	Reduces incentives for substitution	May encourage substitution to avoid EPR

PRO design options: Who is part of the PRO?

Industry-led vs. State-led

Aspect	Industry-led	State-led
Management	Producers or PROs	Government agencies or state-owned entities
Expertise	Leverages industry knowledge	May lack specific industry expertise
Innovation	Often more flexible and innovative	May be less efficient or innovative
Alignment with Policy	May prioritize economic interests	Ensures alignment with public policy objectives
Oversight	Requires strong regulatory framework	More direct control and enforcement
Transparency	Potential conflicts of interest	Generally more accountable to the public

Successful EPR systems balance government oversight with industry management, leveraging government-set frameworks and targets alongside industry expertise for implementation and accountability.

PRO design options: Economic Models

EPR systems can be structured as either monopolistic (single and non-profit) or competitive (multiple and for-profit) models.

Monopolistic (Non-Profit) vs Competitive (For-Profit)

Key Considerations

- **Cost Efficiency:** Competitive models may lead to lower costs due to market forces, while monopolistic models may benefit from economies of scale.
- **Innovation:** Competitive models often drive more innovation, while monopolistic models may focus on standardisation.
- **Oversight:** Monopolistic models are generally easier to regulate and monitor.
- **Coverage:** Competitive models may lead to cherry-picking profitable areas, while monopolistic models ensure uniform coverage.

The choice between these models depends on the specific context, goals, and existing infrastructure of the implementing country or region. Both approaches have been successfully implemented in various EPR systems worldwide.

With or without PRO?

PROs can be highly effective when well-regulated and transparent, but challenges like monopolization, high costs, weak enforcement, and lack of informal sector inclusion must be addressed for a fair implementation.



Collective Systems

Challenges of PROs in EPR

-  **Monopoly Risk** – A single PRO can increase costs & limit innovation.
-  **Weak Enforcement** – Poor regulation leads to inefficiencies & waste underreporting.
-  **High Costs** – Small businesses may struggle with PRO fees.
-  **Exclusion of Informal Sector** – Job losses for waste workers.
-  **Ineffective Waste Management** – Focus on compliance over real impact.
-  **Greenwashing** – Companies may appear eco-friendly without real action.

Solution: **Strong regulation & inclusion of all stakeholders** for
an effective system.

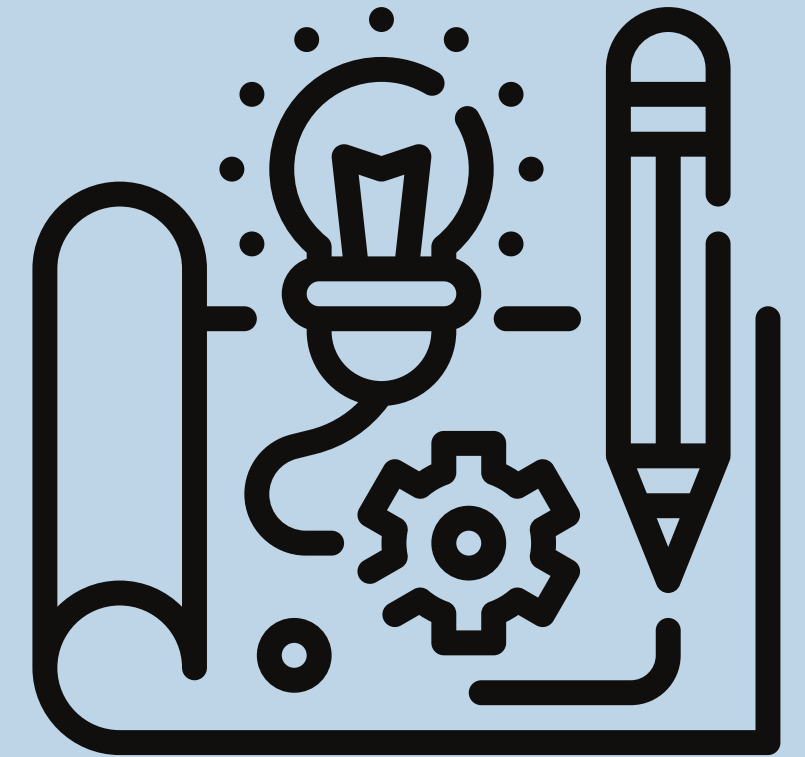


DIDACTICS

Policy Prototyping Exercise: Design Options

Country-Specific Adaptation:

1. Mandatory or voluntary EPR system, why?
2. All materials or selected materials? (Focus could be on plastics)
3. Individual or Collective EPR?
4. How does the interaction between different stakeholders in your EPR system look like - Develop a graphic and present!
5. Main question: Who are the key stakeholders, and what are their roles in the EPR system?



Module

3

Worksheet Module 3

Designing a Pilot EPR Scheme for a SIDS Context

STEP 1 – DEFINE THE SCOPE

Which packaging waste stream will it target?

- ☐ Plastic bottles
- ☐ Beverage cartons
- ☐ Other: _____

Country / Island / Region: _____

STEP 4 – SYSTEM FEATURES

Briefly describe unique features of your EPR system design.

Monitoring system: _____

Role of PRO (if any): _____

Other key features: _____

STEP 1 – STAKEHOLDER MAPPING

Draw or list all the key stakeholders involved.

Use arrows to show their connections.

- Producers / Importers
- Government bodies
- Waste collectors
- Recyclers
- Retailers
- Consumers
- PRO (if applicable)

STEP 3 – DEFINE THE SCOPE

Show how the system is funded and how materials move through it.

- Who pays fees?
- Who collects them?
- How are funds used?
- Are subsidies or incentives included?

STEP 5 – PREPARE YOUR PITCH

Prepare to present your EPR system in 2 minutes. Use this space to outline key points:



Module

4

What are the complementary measures to EPR systems and how do they work?

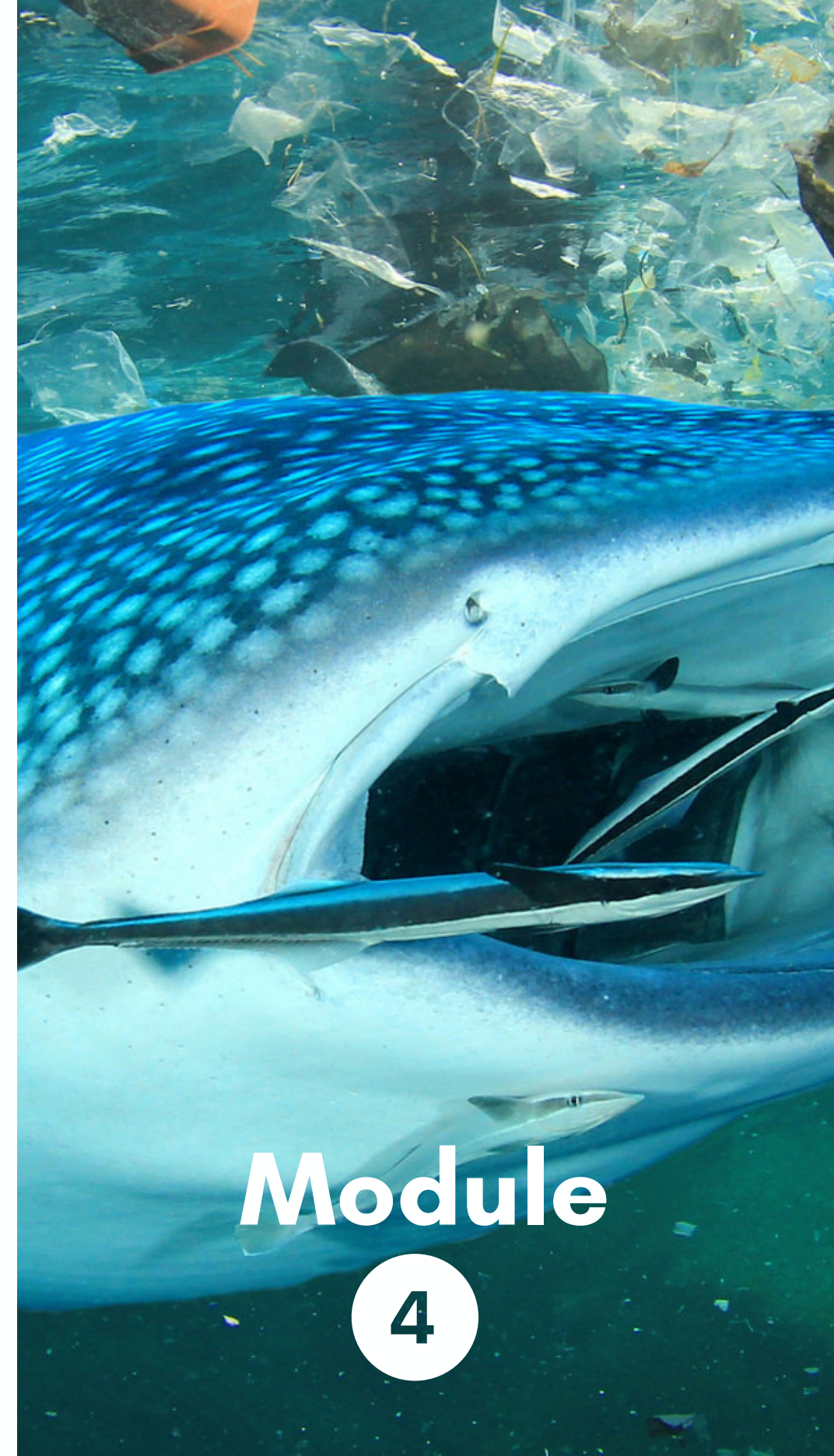


INTRO QUESTIONS

What are complementary and already existing policies or supporting measures?

1. Recap – Let's think again about the status quo in your country: Which policies, initiatives, voluntary measures, regulations are in place and do already support the development of an EPR system?
2. Which gaps exist?

Country-Specific Background:



Module

4

Worksheet Beginning of Module 4

Recap: What policies or measures in your country currently support EPR?

Briefly note the limitations or barriers from your stakeholder perspective.

Are there any supporting instruments like deposit refund schemes?

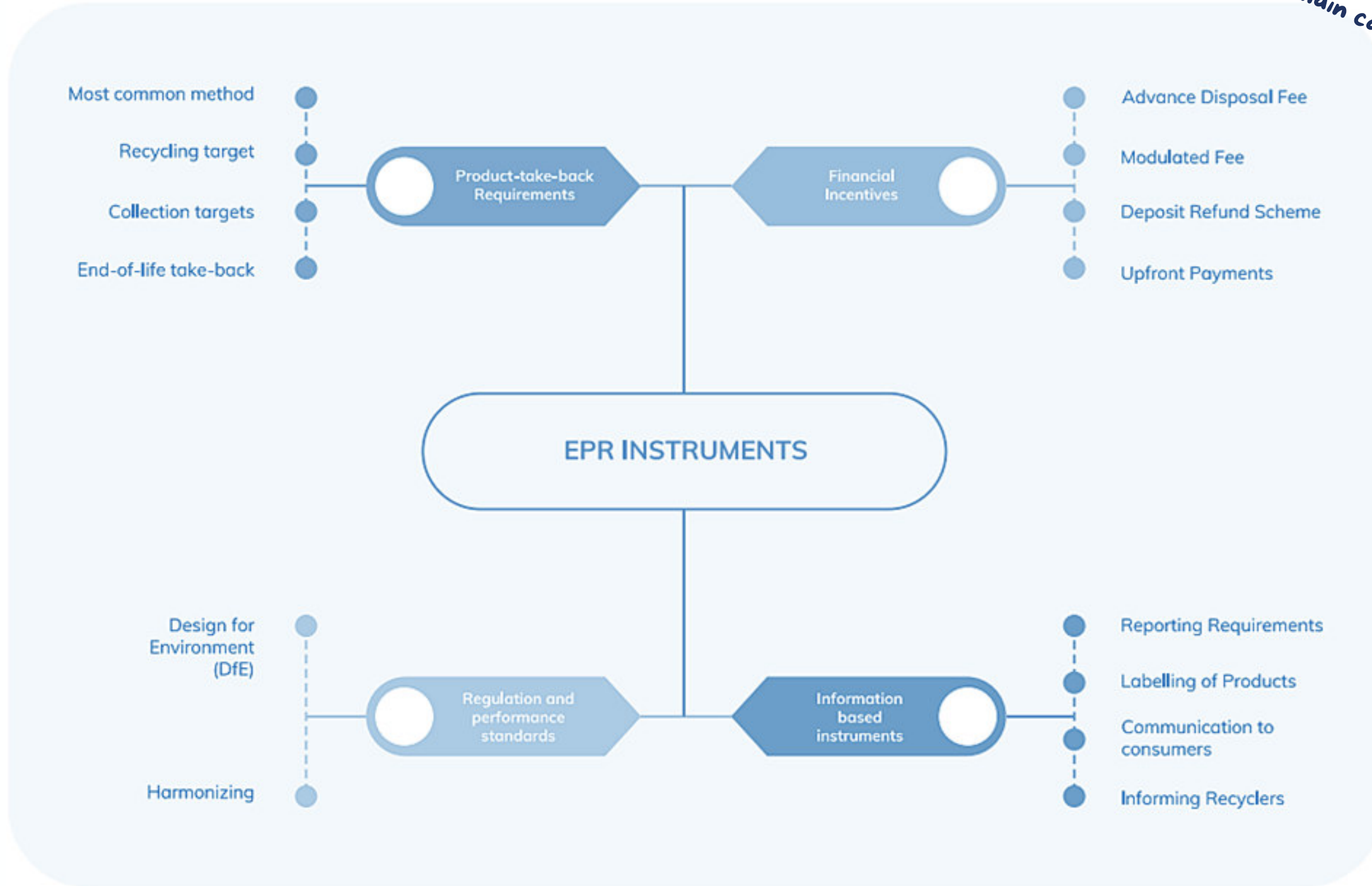
Mention if such tools exist and how they help.

What gaps or missing elements are there?

Identify what's still needed to improve the system.

Regulatory policies and supporting instruments

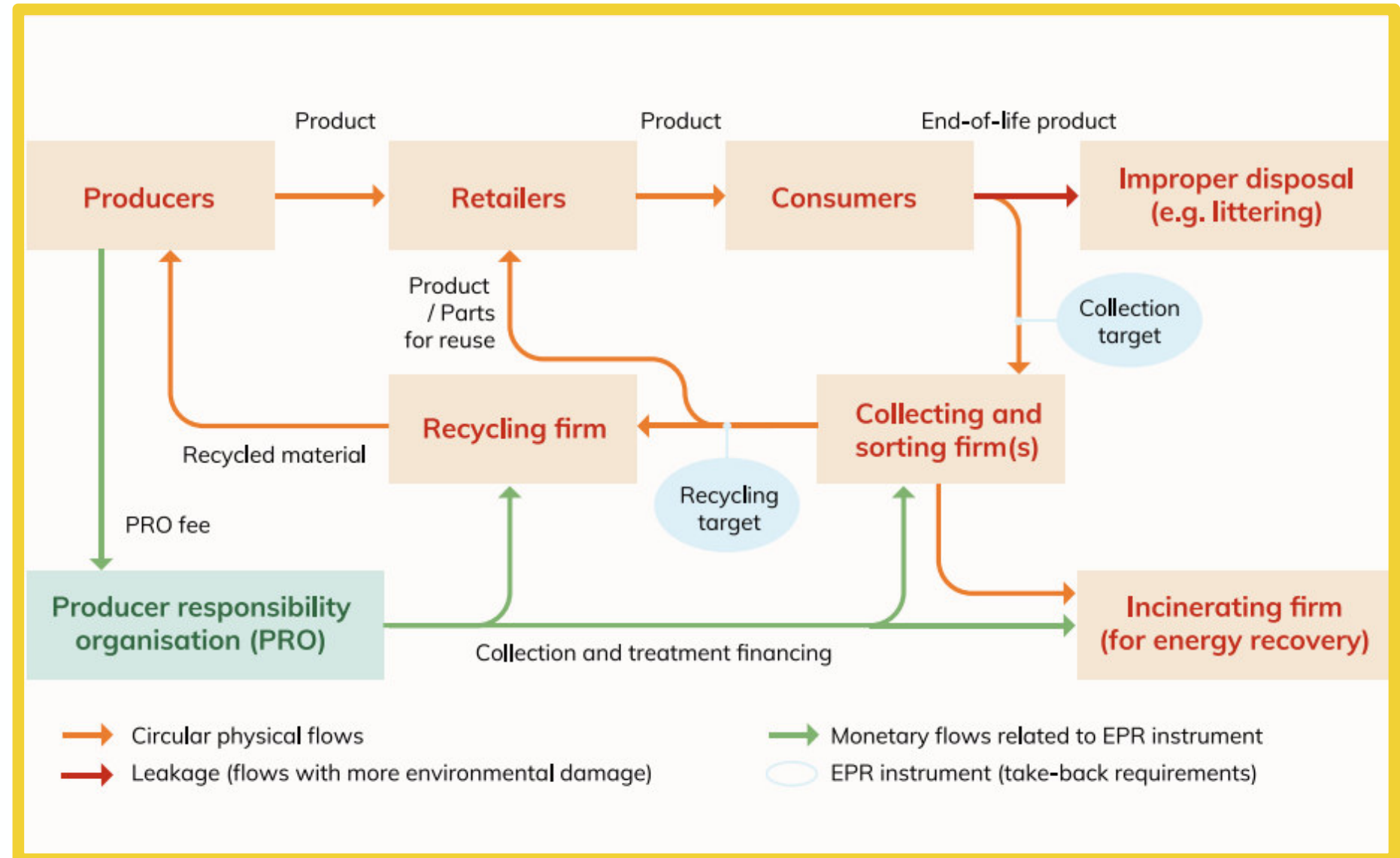
*Different tools can be selected for the implementation of an EPR system.
--> 4 main categories:*



Product Take Back Requirements

- **Definition:** Product take-back requirements oblige producers to reclaim their products at the end of their lifecycle.
- **Purpose:** Ensures proper waste management, recycling, and sustainability.
- **Key Methods:**
 - Direct product collection.
 - Consumer awareness campaigns.
 - Deposit refund systems.
- **Circular Economy Impact:** Drives sustainable product lifecycle management and reduces waste.
- **Collection Quotas:** Reinforces take-back requirements by setting specific waste recovery targets

Take-back requirements for end-of-life products.



Source: Dimitropoulos et. al (2021);

https://www.researchgate.net/publication/354117082_Extended_producer_responsibility_Design_functioning_and_effects

Economic and Market-Based Instruments



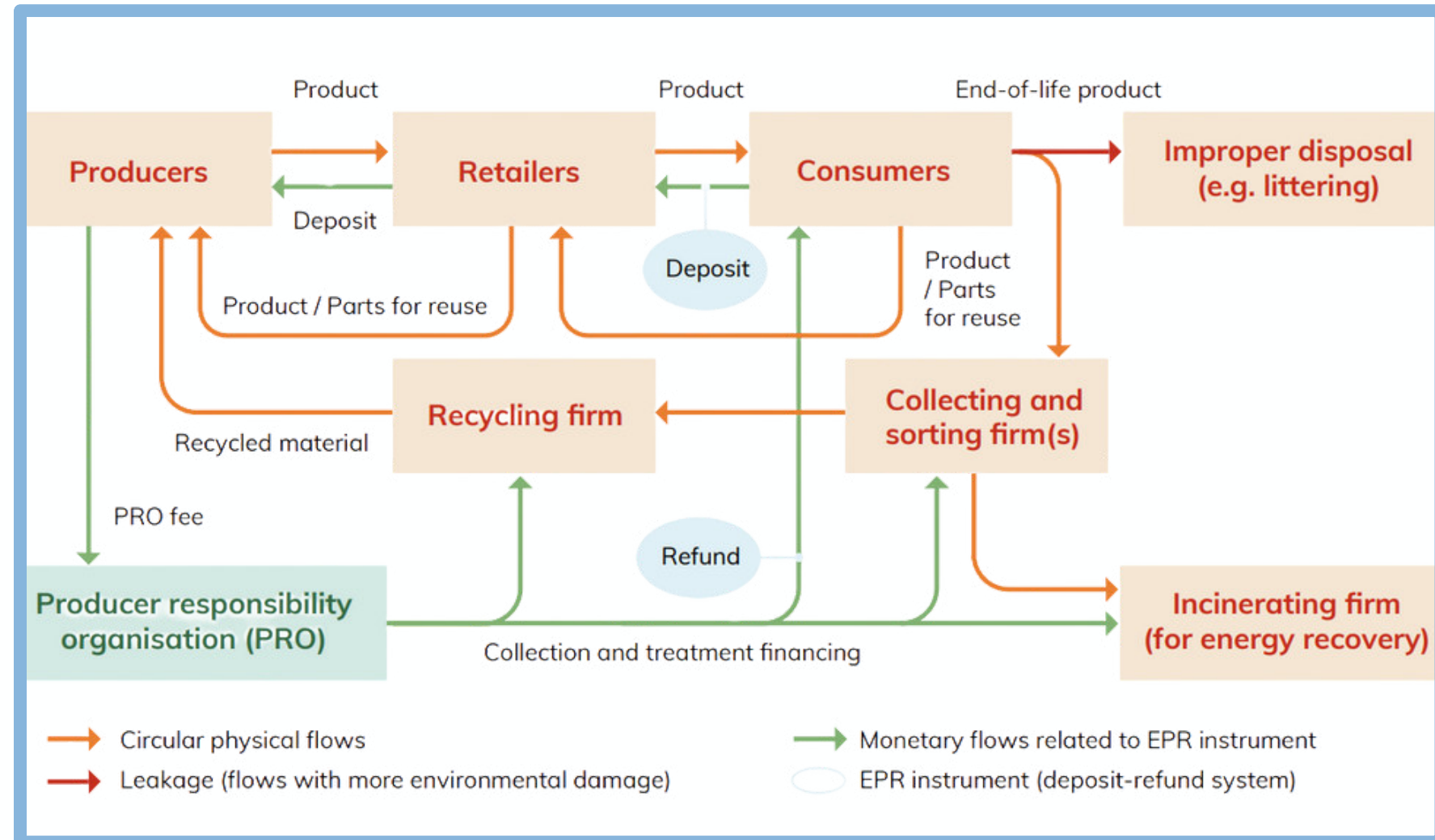
A DRS for end-of-life products returning to producers via retailers.

• Key Instruments:

- **Deposit Refund Schemes (DRS):** Encourages product return through refundable deposits; promotes eco-friendly options
- **Advanced Disposal Fees (ADF):** Covers operational costs but lacks incentives for recyclability improvements.
- **Modulated Fees:** Adjusts producer contributions based on product characteristics (e.g., recyclability, reusability); incentivises sustainable product design.
- **Material Taxes:** Discourages use of harmful materials; promotes recycled or less hazardous alternatives.

• Emerging Tools: Plastic Credits:

- **Definition:** Tradable certificates for recycling plastic waste; offsets corporate plastic footprints.
- **Complementary Role:** Mobilises resources for waste management infrastructure and incentivises collection of hard-to-recycle plastics.
- **Challenges:** Risks undermining EPR by competing for resources and weakening stricter regulations.



Source: Dimitropoulos et. al (2021);

https://www.researchgate.net/publication/354117082_Extended_producer_responsibility_Design_functioning_and_effects

Deposit Refund Schemes (DRS)



Video Link:

<https://www.youtube.com/watch?v=dzhPEE0jaGE>

<https://www.youtube.com/watch?v=dzhPEE0jaGE>

Information-Based Instruments



- **Core Role:** Educate stakeholders on environmental impacts and waste management to support EPR schemes.
- **Role in EPR:**
 - Promotes transparency and accountability among producers and consumers.
 - Empowers consumers to make informed decisions and adopt sustainable disposal practices.
 - Builds the final pillar of an effective EPR scheme by addressing the dissemination of information

Key Tools:

Reporting Requirements: Ensures producers provide transparent data on product sustainability and waste management efforts.

Product Labelling: Communicates environmental characteristics, recyclability, and recycled content to consumers.

Consumer Communication: Educates consumers about producer responsibility and proper waste separation.

Recycler Information: Enhances recycling efficiency by providing details on material composition.

Regulation and Performance Standards



- **Core Role:** Strengthen EPR systems by embedding sustainability into product design.
- **Global Harmonisation:** Aligning standards for traded products amplifies environmental benefits and fosters consistency.
- **Impact on Innovation:**
 - Encourages sustainable product design.
 - Reduces waste and enhances recycling processes.

Key Standards:

Design for Environment (DfE): Mandates eco-friendly materials, optimised production techniques, and reduced environmental impacts.

Minimum Recycling Content Quotas: Requires a specific percentage of recycled materials in products.

Recycling Quotas: Places responsibility on producers to prioritise recycling over incineration or energy recovery.

Effect of specific EPR instruments on product innovation and consumer behavior

	No product innovation	Product innovation	Product redesign	Modified material use	Consumer behavior change
Regulatory instruments					
Take back requirements			●	●	●
Economic instruments					
ADF	●				
Modulated fee		●	●	●	
DRS	●			●	●
Regulation and performance standards					
DfE		●	●	●	
Information based instruments					
Labelling of products		●			●
Reporting requirements	●				
Consumer communication	●				●
Others					
Voluntary schemes		●		●	●

Source: Dimitropoulos et. al (2021);
https://www.researchgate.net/publication/354117082_Extended_producer_responsibility_Design_functioning_and_effects

Key points on enhancing EPR:

- ▶▶ **Littering Prevention and Clean-Ups:** Clean-up costs for littering and beaches are higher than collection systems, so integrating these costs into EPR can encourage producers to implement litter prevention measures.
- ▶▶ **Awareness Raising:** Informing consumers about their choices and the importance of waste separation is crucial for effective EPR and can lower overall waste management costs.
- ▶▶ **Labelling Obligations:** Product labels can guide consumers on making better purchasing decisions and help identify products under EPR, including proper disposal methods.
- ▶▶ **Reporting Obligations:** Producers and recyclers must report to ensure compliance with EPR regulations.
- ▶▶ **Information Requirements:** Producers need to provide recyclers with material and chemical information to avoid contamination and enhance the quality of recycled materials.

DIDACTICS

How can collection quotas for plastic waste under EPR be adjusted over time?

They can be decreased to lower costs.

They remain constant to ensure stability.

They can be increased to raise ambitions.

Send

Dein Name ist nicht sichtbar

Which of the following is an example of an economic instrument in an EPR system?

Design for Environment (DfE) standards

Deposit Refund Scheme (DRS)

Recycling quotas

Product labeling

Send

Dein Name ist nicht sichtbar

Which of the instruments most fosters modified material use

Labelling of products

Modulated fee

Advanced disposal fee

Reporting requirements

Send

Dein Name ist nicht sichtbar



Module

4

DIDACTICS

How can producers increase demand for recycled materials and reduce reliance on virgin materials?

Increase virgin material use.

Adopt minimum recycled content quotas.

Ignore product design standards.

Absenden

Dein Name ist nicht sichtbar

What is the primary goal of deposit-refund schemes in promoting sustainability?

Encourage recycling and reduce waste.

Increase costs for manufacturers.

Subsidize fossil fuel production.

Absenden

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Module

4

DIDACTICS

Which statement below is correct?

Administrative expenses (e.g., compliance monitoring, reporting) account for around 30% of the total costs of an EPR system.

Waste collection, sorting and recycling account for around 50%-70% of the total costs of an EPR system.

Administrative expenses typically account for 40% of the total costs of an EPR system.

Absenden

Dein Name ist nicht sichtbar

Which institution is primarily responsible for coordinating the collection, sorting, and recycling of packaging waste in an EPR system?

Producer Responsibility Organization (PRO)

Waste Management Operators

Local Municipal Authorities

Absenden

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Module

4



Module

5

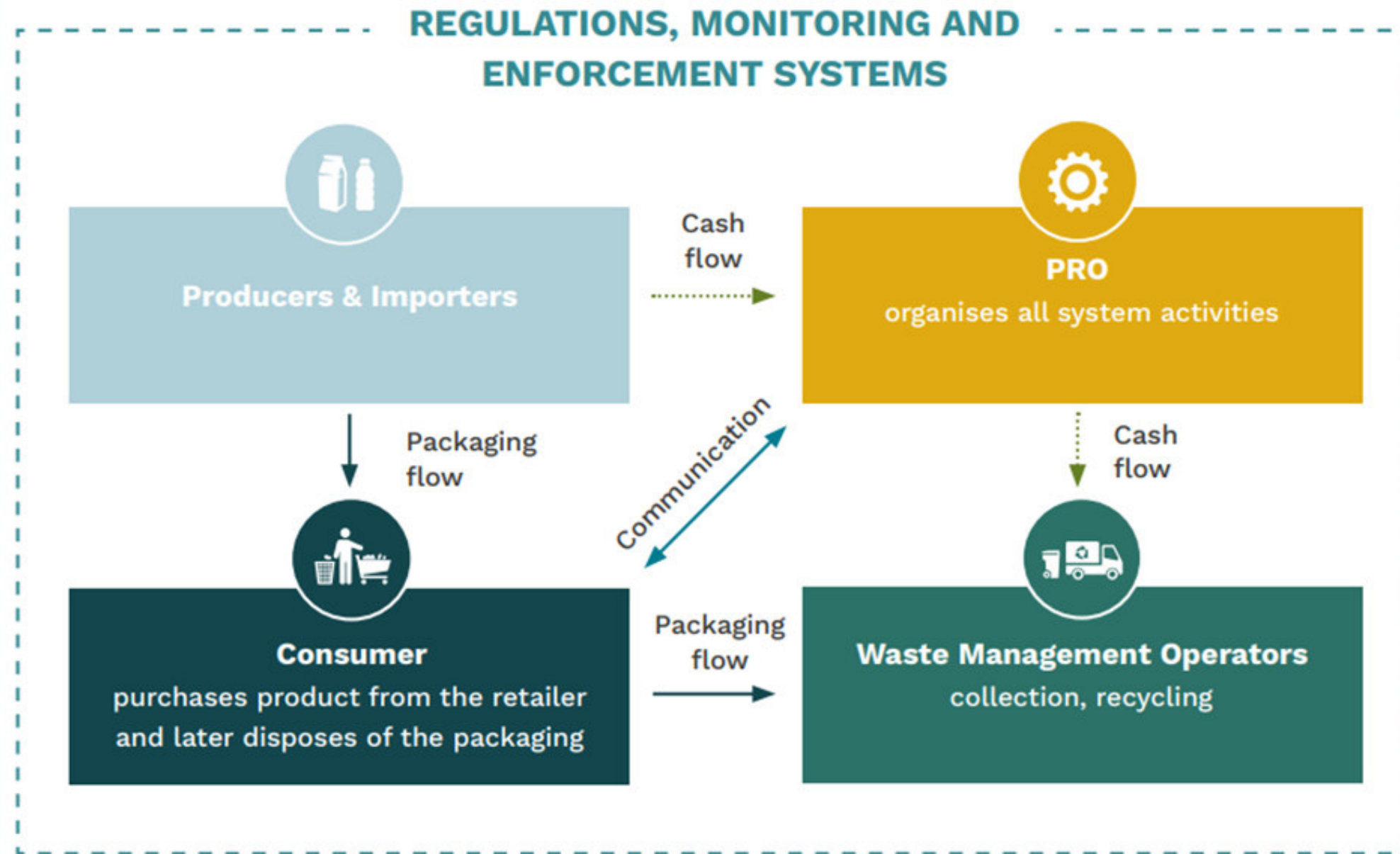
Institutional Implementation of EPR



Insitutional set-up



**Bringing the different elements
and pieces together!**



Legislative Framework – Authorities set legal requirements and monitoring responsibilities.

Producer Responsibility – Companies (e.g., manufacturers, importers) handling packaging must comply.

PRO Management – Producer Responsibility Organizations (PROs) handle collection, sorting, and recycling.

Fee System – Producers pay fees based on packaging type and quantity, incentivizing eco-friendly designs.

Registration & Compliance – Producers must register with a PRO and ensure legal compliance.

Source: Prevent Waste Alliance (2024), https://prevent-waste.net/wp-content/uploads/2024/03/PREVENT-Toolbox-interactivePDF_2024.pdf

Producer Responsibility Organization (PRO)



PRO is a third-party entity that manages the collection, sorting, and recycling of packaging within an EPR system and its members. It plays a crucial role in ensuring that obligated companies meet their collection and disposal responsibilities.



System Management

Registration and compliance

**Tender and contract
management**



Take-back obligations

**Communication and
Information**

Education and awareness



Fee collection

Fund management

Monitoring and auditing

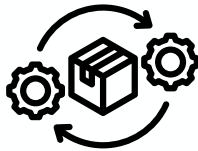
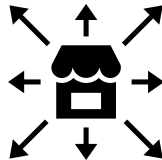
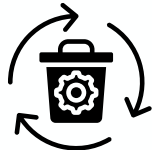


The PRO requires supervision by an external authority, like a government body or appointed supervisor.

Key success factors for the PRO include: effective organizational structure, adequate funding, efficient administration, monitoring and enforcement of the EPR system.



Stakeholder engagement and management

	Stakeholder	Roles & Responsibilities
	Raw material suppliers & manufacturers	Provide packaging materials; ensure recyclability & reusability.
	Producers & importers	Introduce packaged goods; influence packaging design & recyclability.
	Distributors & retailers	Connect producers with consumers (e.g., supermarkets, stores).
	Consumers	Dispose of packaging correctly; separate waste for recycling.
	Waste management operators	Collect, sort, and recycle packaging waste to high standards.
	Producer Responsibility Organization (PRO)	Register producers, collect fees, and coordinate recycling.
	Government & public authorities	Legislate, regulate, and supervise EPR implementation. Facilitate waste collection & consumer awareness.

Stakeholder engagement and management



For Government:

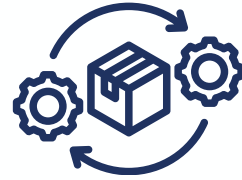
- Establish clear objectives, rules, and tracking systems.
- Provide adequate lead time for data collection and infrastructure planning.
- Set clear deadlines and encourage voluntary industry participation before transitioning to mandatory EPR.
- Define policy mixes based on economic and environmental efficiency.
- Promote eco-design incentives to encourage sustainable production.
- Engage in knowledge exchange with countries facing similar waste management challenges.



For Consumers:

- Separate waste at the household level to improve recycling quality.
- Choose eco-design products that are reusable, repairable, and recyclable.
- Demand products with longer life cycles to promote circular economy practices.
- Repair products when possible to extend usability.
- Support zero-waste products to minimize packaging waste.

Stakeholder engagement and management



For Industry:

- Improve packaging circularity by reducing raw material use and incorporating recycled content.
- Join or create a PRO to fulfill EPR obligations.
- Contribute fees to PROs to cover waste management costs.
- Ensure PROs invest in communication and awareness to encourage public participation.



For Tourism:

- Establish waste management facilities at resorts to pre-process waste before sending it to regional centers.
- Financially and technically support neighbouring island communities in sustainable waste management.
- Promote local waste-to-wealth initiatives by offering shelf space for recyclable products in souvenir shops and tours.
- Purchase eco-designed, durable, and recyclable products in bulk to reduce single-use packaging waste.

For recyclers

Key elements of fair and inclusive Informal Recycling Sector (IRS) schemes in the Global South:



Provide platforms for waste pickers and their organisations to engage in policy design, governance, and monitoring.



Clear rules for integrating the IRS and outlining responsibilities of PROs. Countries like Chile and South Africa have developed EPR frameworks that specify how PROs should include waste pickers in waste management systems (Chapter 6).



Fostering **partnerships and collaborations** with waste picker organisations. This can enable a just transition towards reducing plastic pollution and help waste pickers meet EPR requirements.



Transparency and traceability in the plastics value chain. This is crucial for ensuring EPR schemes are just, inclusive, and effective



Implement capacity building and technical and financial assistance programs. These should focus on:



- Clarifying EPR systems and workers' rights
- Improving technical skills for safe waste management
- Offering infrastructure and tools for effective participation



Provide fair remuneration and living income for IRS workers. This can be achieved by:



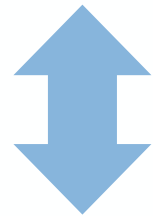
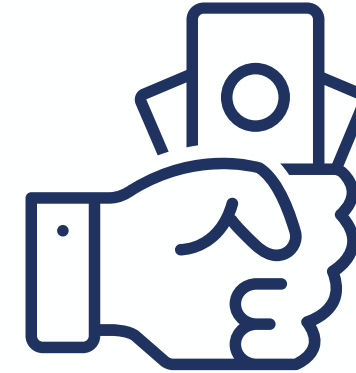
- Fund the IRS through EPR fees and municipal taxes.
- Provide incentives for collecting low-value, time-consuming plastics.
- Ensure payments cover costs for training and essential services.

Financial flows



Main Cost Components in an EPR System

- 50 - 70%** • Collection, sorting & recycling (vehicles, facilities, labor, energy).
- 10 - 20%** • Disposal of non-recyclables (landfill fees, incineration).
- 5 - 10%** • PRO administration (compliance, reporting, audits).
- 5 - 15%** • Public awareness & education (campaigns, workshops).
- 5 - 15%** • Research and development to improve recycling technologies and eco-design

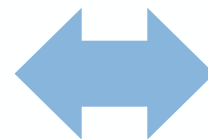


Factors Affecting EPR Fees

- Waste composition & recyclability.
- Collection & sorting costs.
- Recycling infrastructure.
- Municipal contributions.
- Mandatory recycling targets.

Fee Adjustments & Incentives

- Bonuses for easy-to-recycle materials.
- Higher fees for hard-to-recycle packaging.
- Examples: France, Germany, Italy use different incentive models.



Financial flows



- 1 During the **early years of implementing the EPR system**, costs must be regularly adjusted as they typically rise until full setup is achieved. Key points include:

Regular fee adjustments are necessary.

- Fees vary based on the quantity and type of waste/packaging material.
- Fees can incentivize behaviors, such as using less expensive materials like paper over plastic.

Some EPR systems modify fees to better align with specific needs, including:

- ▶▶ Bonuses/maluses based on recyclability: Reduced fees for easily recyclable packaging and higher fees for non-recyclable types, though guidelines vary internationally.
- ▶▶ Bonuses for specific labeling or disposal instructions.
- ▶▶ Unit-based fees: Charges per packaging unit in certain countries like Spain and Belgium.

Supervision, monitoring and enforcement



Ensuring Compliance & Preventing Free-Riding

- Legal framework that defines responsibilities.
- State authorities monitor compliance, conduct inspections & impose penalties.
- A central register tracks packaging data & ensures producers pay required fees.

Key Registers in an EPR System

1. Obligated Companies Register – Tracks producers & packaging volumes.
2. Waste Management Operators Register – Ensures compliance & transparency.
3. PROs Register – Oversees multiple PROs in competitive systems.
4. Monitoring Experts Register – Supports supervision & enforcement.

Key Takeaways

- ▶▶ EPR shifts packaging waste costs to producers.
- ▶▶ Costs & fees vary based on recyclability & infrastructure.
- ▶▶ Strong monitoring ensures compliance & system efficiency.

Supervision, monitoring and enforcement



Effective EPR systems require extensive data management. Essential registers should be established for:

- Obligated companies (producers & importers): to track company info, product materials, and quantities.
- Waste management operators: to detail company activities and technologies used, ensuring transparency and adherence to recycling standards.
- Producer Responsibility Organizations (PROs): especially when multiple PROs are present.
- Experts monitoring/supervising the PROs.

Clear legal frameworks must outline all tasks, powers, and supervisory roles related to these registers.

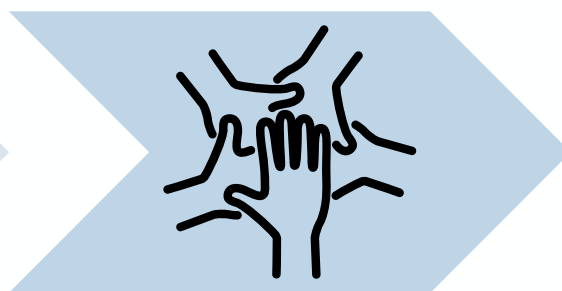


Integrating the informal sector



Steps to be taken to integrate the informal sector:

- **Legal Recognition:** Provide informal workers with identification and include them in regulatory frameworks.
- **Cooperative Formation:** Organise workers into cooperatives to formalise their roles and improve bargaining power.
- **Capacity Building:** Offer training on safe waste handling, sorting, and business management.
- **Social Services Access:** Ensure access to healthcare, social security, and other welfare benefits.
- **Representation in Decision-Making:** Include informal sector representatives in governance structures to ensure their voices are heard.
- **Formal Contracts:** Establish agreements between cooperatives and PROs to provide stability and fair compensation.



Implementing EPR Step - by - Step / Roadmap Development

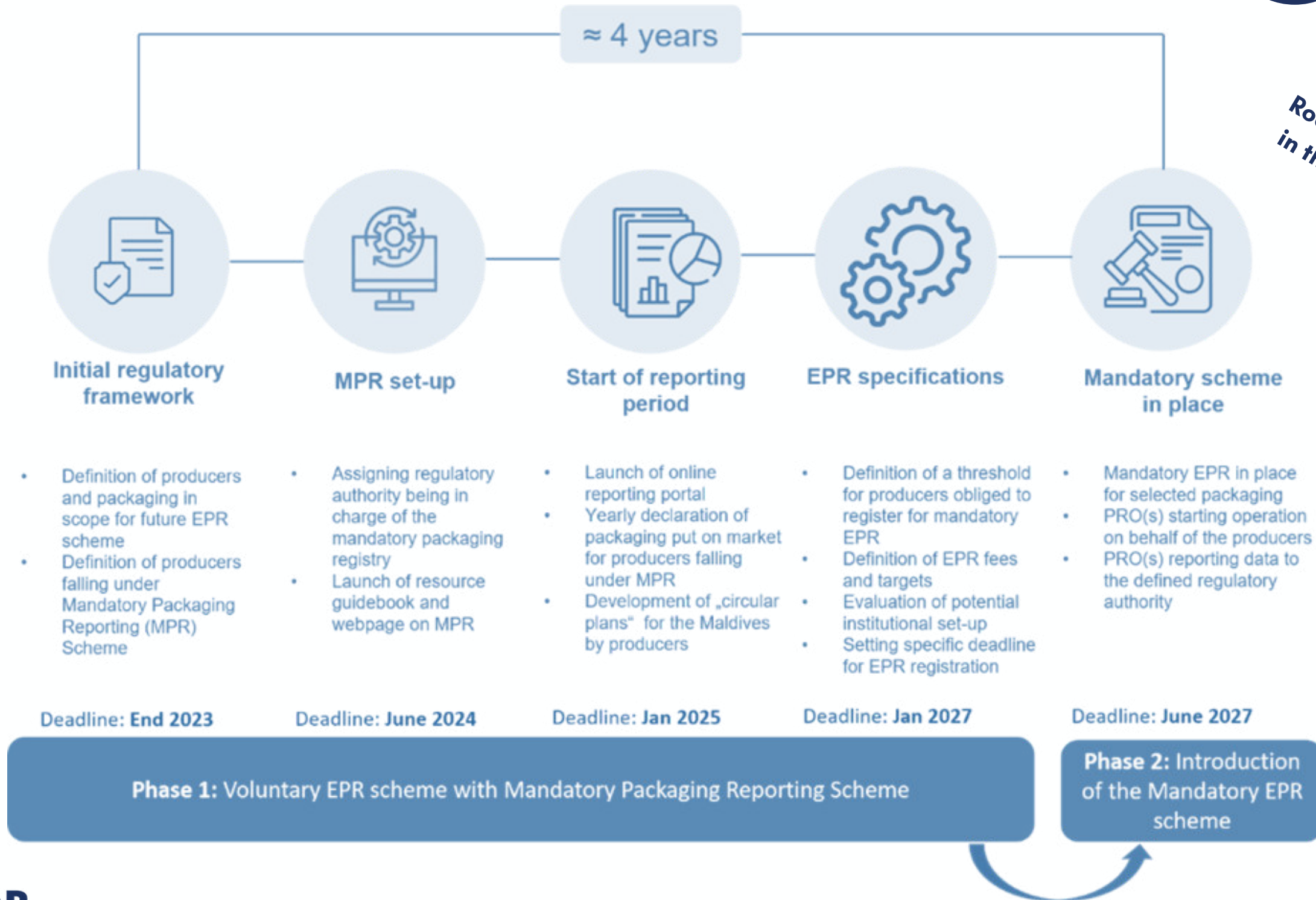


Implementing EPR Step - by - Step / Roadmap Development



EXAMPLE

Roadmap for EPR Development
in the Maldives (developed in
2023)



DIDACTICS

Objective:

Participants will analyze a successful Best Case Study EPR model, identify challenges, and design their own EPR system for a fictional/their own island nation, balancing economic, environmental, and logistical factors.

1

Divide Participants into Groups: Each group represents a different island nation with its own economic and environmental challenges.

Assign roles within each group:

- Government Officials: Draft regulations and funding mechanisms.
- Producers/Importers: Ensure compliance with packaging regulations.
- Consumers: Represent residents and tourists.
- Waste Management Operators: Include formal and informal sectors.

2

Analyze & Brainstorm

- Review the Step by Step Roadmap for an EPR scheme in the Maldives on the slide before.
- Discuss strengths, weaknesses, and adaptations for your fictional SIDS.

3

Designing an EPR Roadmap

- Use the 12-step framework to outline your EPR system.
- Identify key stakeholders, financial flows, and challenges.
- Create a simple visual (e.g., timeline or flowchart) like Figure 15.

4

Role Play and Present

- Simulate negotiations between informal workers, PROs, and government officials.
- Present your roadmap, explaining key decisions and trade-offs.

Module

5



Worksheet End of Module 5

STEP 1 – Assign Roles



Each group acts as a task force. Assign one or more of the following roles:

- *Government – Draft rules & funding tools*
- *Producers/Importers – Ensure compliance*
- *Consumers – Represent public & tourists*
- *Waste Operators – Cover both formal & informal actors*

STEP 2 – Assign Roles and Brainstorm



- *Review a case study*
- *Discuss key strengths, gaps, and needed adaptations*

Group Activity – Designing an EPR Roadmap

Objective: Create a simple EPR roadmap for a real or fictional SIDS, tailored to local needs..

STEP 3 – Design the Roadmap



- *Use the 12-step framework as a guide*
- *Identify key stakeholders, financial flows, and obstacles*
- *Sketch a simple visual (timeline, flowchart, etc.)*

STEP 4 – Role-Play & Present



- *Simulate a discussion or negotiation*
- *Present your roadmap & explain trade-offs and decisions*



Module 6

Case Studies



EPR in Global South

Fair and Inclusive Extended Producer Responsibility (EPR) in the Global South



Global South

Fair and Inclusive Extended Producer Responsibility (EPR) in the Global South

Source: IKHAPP (2024); https://gridarendal-website-live.s3.amazonaws.com/production/documents/:s_document/1096/original/IKHAPP-2024-Fair-and-inclusive-EPR-in-the-global-south.pdf?1713865241

Overview:

This policy brief examines the challenges and opportunities for implementing fair and inclusive Extended Producer Responsibility (EPR) schemes in the Global South, with a focus on **integrating** the **Informal Recycling Sector (IRS)** and reducing plastic pollution.

Background:

EPR has become a popular policy approach to reduce waste and hold producers accountable for product recovery and recycling. While EPR has been successful in the Global North, its implementation in the Global South **faces unique challenges**, particularly regarding the integration of the informal recycling sector.

Objectives:

- Understand how EPR can be designed and implemented to reduce plastic pollution in the Global South.
- Increase plastic recovery rates.
- Improve working conditions and livelihoods in the IRS.

Methodology:

The policy brief draws on existing knowledge, perspectives from a webinar organized by GRID-Arendal and NIVA, and case studies from various countries in the Global South.

RESULTS

- **EPR initiatives for plastic packaging waste have been introduced in several Asian and Latin American countries**, as well as in Africa.
- **Implementation and enforcement** of EPR regulations remain challenging in many countries.
- The **informal recycling sector plays a crucial role** in material recovery but often faces barriers to participation in EPR systems.
- Some countries, like **Chile and South Africa**, have developed **EPR frameworks that outline responsibilities for integrating the IRS**.

EPR in Small Island Developing States (SIDS)

Stakeholder inclusion, local material recovery facilities, and community-based waste governance.

EPR in Small Island Developing States (SIDS)

Source: adelphi (2023): https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

- Inclusive waste management systems integrating informal workers.
- Encouragement of sustainable production practices.
- Enhancement of local capacities through training initiatives.

Waste Situation:

- SIDS inhabitants generate 2.3 kg of municipal solid waste per capita daily, 48% higher than the world average.
- A significant portion of waste in SIDS consists of organics and biodegradables, but there's an increasing amount of inorganic waste from imported products.
- Lack of infrastructure for recycling is a major issue in SIDS.

Key Players in Waste Management:

- Using the Maldives as an example, the manual outlines various stakeholders involved in waste management.
- These include government ministries, regulatory bodies, state-owned companies, private sector entities, and civil society organizations.

Challenges in SIDS:

- **Geographic challenges:** Small land masses and areas compared to their exclusive economic zones and geographical isolation and dispersion, making centralized waste management difficult.
- **Environmental sensitivity:** Vulnerability to climate change, biodiversity loss, and natural disasters.
- **Fragile ecosystems:** including coral reefs and mangroves
- **Limited resources:** Lack of infrastructure for recycling
- **Economic vulnerabilities:** Heavy reliance on imports for basic resources, leading to increased inorganic waste
- **Dependence on tourism,** which contributes significantly to waste generation
- **Increasing amount of inorganic waste** from imported products.
- **Disposal issues:** Open burning of waste due to inability to transport waste to central facilities
- **Illegal dumping:** of waste into the ocean and landfilling near coastal areas

Opportunities:

- Exploring the feasibility of locally based **Material Recovery Facilities.**
- **Involving all stakeholders** in the development and implementation of waste management systems.
- Conducting meaningful **stakeholder consultations** to ensure successful policy implementation.
- **Considering and incorporating feedback** from various stakeholders, including the public, during policy formulation and implementation.

Philippines EPR scheme

Inclusive and Impactful: Implementing EPR in the Philippines

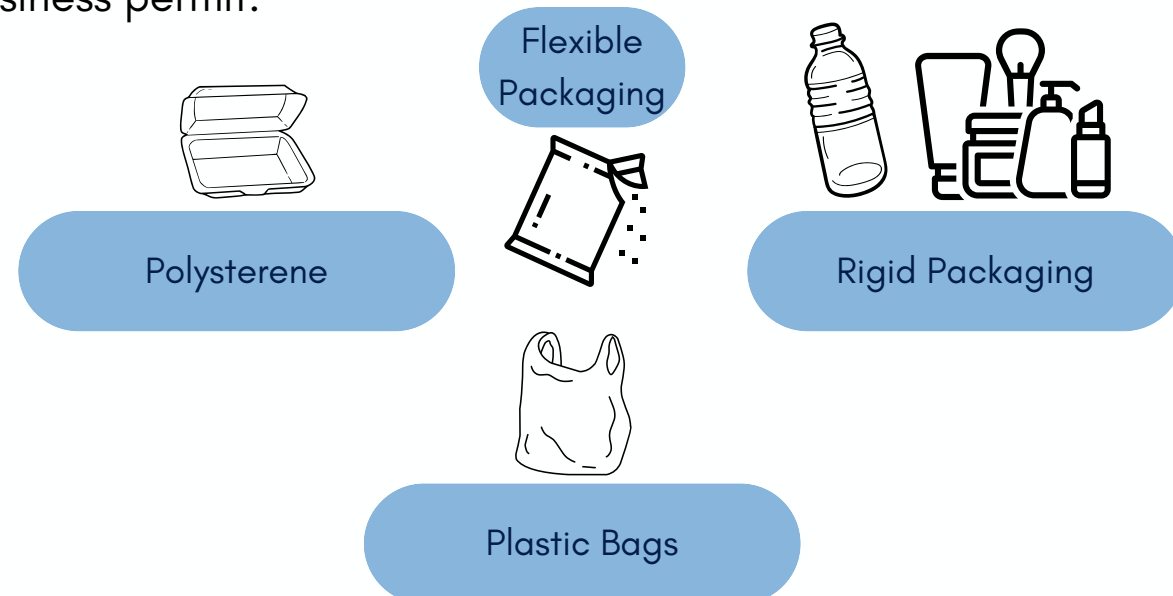


Case Study: Philippines

Source: PCX Solutions (2024): [PCX Solutions \(2024\): https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebaea228.pdf](https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebaea228.pdf)

Background:

- The Philippines enacted the Extended Producer Responsibility (EPR) Act of 2022 (Republic Act No. 11898), amending the Ecological Solid Waste Management Act of 2000 led by the Department of Environment and Natural Resources (DENR)
- The EPR for plastic packaging further progressed as the DENR Administrative Order (DAO) No. 2023-02 or the Implementing Rules and Regulations (IRR) of RA 11898 was approved and published on January 24, 2023
- The legislation mandates companies with assets exceeding PHP 100 million (~\$1.7 million USD) to manage their plastic packaging waste through reduction, recovery, reuse, recycling, or proper disposal. If they do not comply, there are high penalties (89K - 178K USD for the first offense, scaling up to 268K - 357K USD for the third + suspension of their business permit).



Obligated Enterprises (OEs)



Definition of OEs in the IRR of RA 11898:

- brand owners who **sell or supply any commodity under a brand, label or identity** using a product it produced, or supplied to it by another manufacturer or supplier; or
- **product manufacturers or importers** that supply its commodities for the use by the general consumer or distribute the same as a material product of a brand owner.

Case Study: Philippines

Source: PCX Solutions (2024): [PCX Solutions \(2024\): https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf](https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf)

Producers, referred to as "Obligated Enterprises," are required to:

1. Register EPR programs with the National Solid Waste Management Commission (NSWMC).
2. Meet annual recovery targets for their plastic packaging footprint.
3. Submit an independent third-party audited report containing the plastic packaging footprint, recovery and diversion accomplishments, and EPR program compliance on an annual basis

OEs are required to report their annual plastic packaging footprint and use this as the basis for their annual recovery and diversion targets.

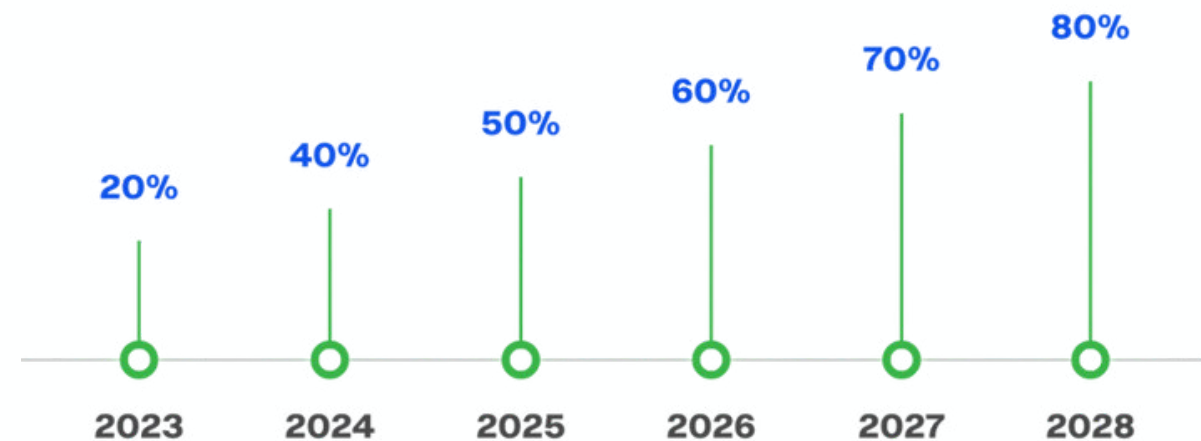


Figure 4. Plastic packaging waste recovery and diversion targets

As of 2023, **over 947 companies registered EPR programs, with recovery efforts surpassing the initial 20% target.** However, challenges remain, including low awareness among smaller enterprises, gaps in recycling infrastructure, and the need for more robust upstream reduction strategies. It is highly likely, as demonstrated by the PRO subset, that the market leaders/ top companies (top 10%) are responsible for over 60% of the footprint and diversion.

Case Study: Philippines

Source: PCX Solutions (2024): PCX Solutions (2024): https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebaea228.pdf

Difference in approach - in comparison to developed countries with elaborated EPR schemes.

Developed Countries

- High focus on taxation and eco-modulated feed
- Markets with a high tax base and rate of tax compliance
- Functioning Waste Management infrastructure and industry

SIDS/Developing Countries (including the Philippines)

- Limited waste management infrastructure, large informal economies and low tax base
- Ambitious and data-driven, but pragmatic targets
- Six upstream measures and six downstream measures (incl. Plastic Credits) were included in the legislation.

Upstream & Downstream measures for EPR implementation

- **Appropriate labelling of products and packaging materials**
- **Partnerships with local governments, communities and informal sector**
- **Information and Education Campaign Schemes**
- **Investment in commercial/industrial waste diversion or disposal facilities**
 - **Viable reduction rates plan**
 - **Waste Clean Up in coastal/public areas**



- **Reusable Packaging products or packaging design**
- **Waste recovery schemes in coastal and public areas through redemption, buy-back offsetting**
- **Inclusion of recycled content or recycled materials in packaging materials**
- **Diversion of recovered waste**
- **Adoption of appropriate product refilling systems for retailers**
- **Transportation of recovered waste to proper diversion or disposal sites**

Case Study: Philippines

Source: PCX Solutions (2024): [PCX Solutions \(2024\): \[https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf\]\(https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf\)](https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf)



There are 8 PROs in the country

The role of Producer Responsibility Organizations (PROs):

Producers have the option to comply individually or through Producer Responsibility Organizations (PROs). PROs, such as PCX Solutions and PARMS, assist companies in meeting their EPR obligations by:

Auditing Plastic Waste Footprints:

PROs connect the OEs with third-party auditors who are able to verify their individual calculations. These audited individual footprints are then submitted to the PRO for consolidation

Communication:

The PRO communicates the required amount of waste diversion per OE and each individual member must recover and divert that amount whether on their own or through plastic credits.

Providing Guidance:

Consults on the necessary chain of custody documentation and facilitates the verification of waste recovery and diversion activities to ensure that it includes the complete value chain and is fully traceable

EPR Compliance Report:

At the end of each compliance year, the PRO puts together an EPR compliance report and engages an independent third-party auditor to perform validation and verification of the declarations. This results in an EPR Compliance Audit Report (ECAR), which is then submitted to the DENR-EMB.

Case Study: Philippines

Source: PCX Solutions (2024): [PCX Solutions \(2024\): \[https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf\]\(https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf\)](https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf)

Plastic Credits: A Market Based Solution for Plastic Waste Management

- Introduced by PCX Solutions in 2020 in the Philippines as a voluntary market instrument.
- Aimed at helping companies take responsibility for their plastic footprint.
- Reviewed and deemed viable for the mandatory EPR (Extended Producer Responsibility) scheme during the development of the Philippines' EPR law.

Recommendations for National Standards

- Develop a national standard for plastic waste recovery and diversion certificates:
- Include definitions, qualifications, governance, and impact verification.
- Ensure integrity, traceability, and transparency of results.
- Support the waste management sector and transition to a circular economy.
- Emphasize environmental and social safeguards:
- Stricter enforcement of laws protecting air, water, land, and ecological health.

Additional task of a PRO - Issuance of Plastic Credits:

Issues Plastic Credit Certificates to member OEs, ensuring the veracity and traceability of each credit through supporting documentation.



Plastic Credits under the **Plastic Pollution Reduction Standard (PPRS)** refer to an environmental unit representing 1,000 kilograms or 1 metric ton of post-consumer plastic waste diverted away from nature, which is obtained through documented and verified collection, aggregation, and recycling or processing activities. Each unit is generated through an end-to-end process that starts from collection and concludes in the end-of-waste processing of the collected feedstock

Case Study: Philippines

Source: PCX Solutions (2024): [PCX Solutions \(2024\): https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf](https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03ebee228.pdf)

Solutions for data capturing and transparency

Public registry

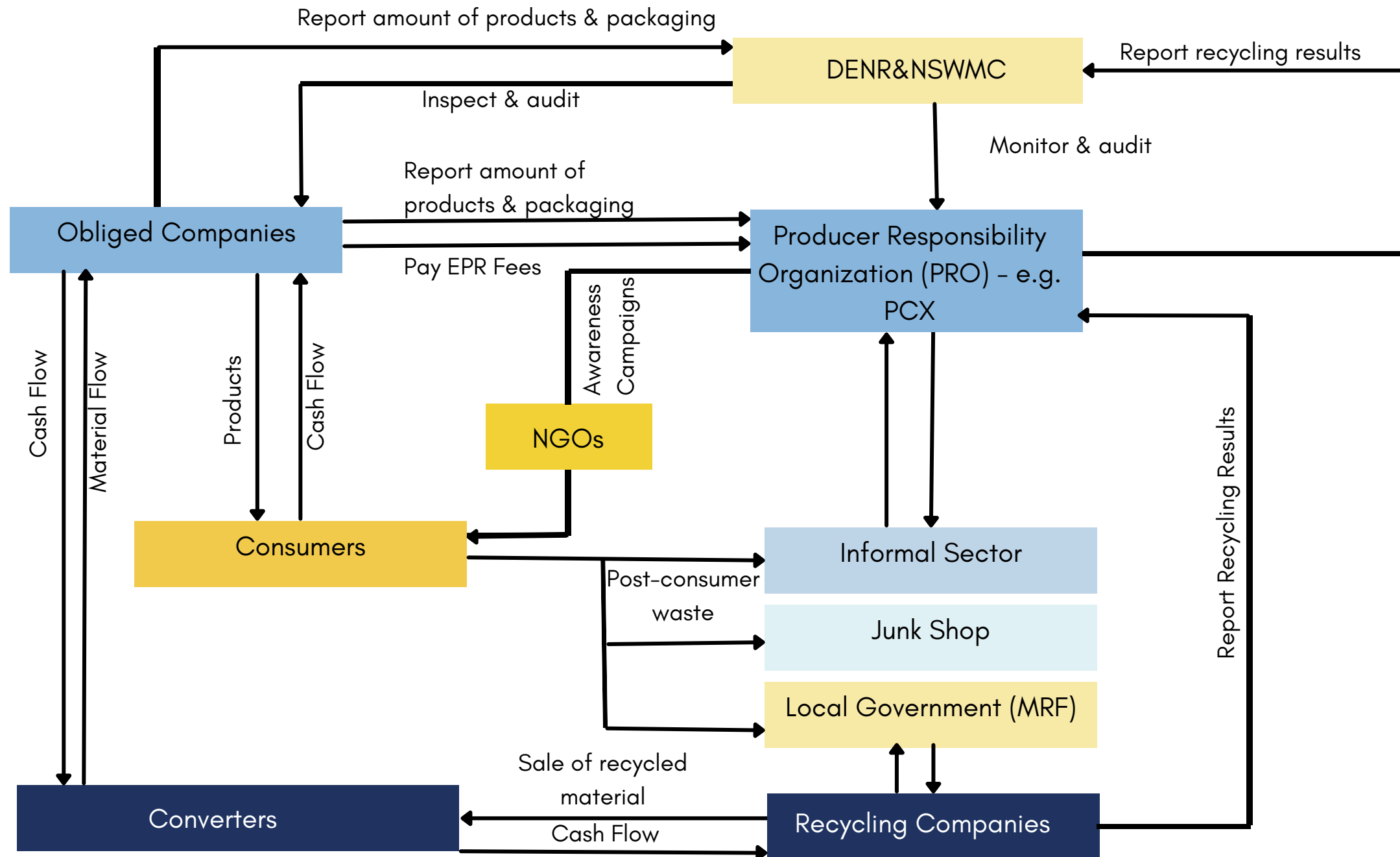
- In 2023, focus group discussions and consultations were held to workshop the EPR portal (with LGUs, OEs, PROs, NGOs, auditors, and waste diverters)
- DENR is collaborating with a third-party developer to implement the portal, which is currently in beta testing.
- The portal aims to enhance transparency, accountability, and public awareness within the EPR system.
- A publicly accessible registry of waste recovery and diversion certificates is recommended:
 - Prevents double counting/selling and potential corruption.
 - Builds public trust in the system.
 - Adds an extra layer of third-party validation and verification.

Reporting and Auditing Standards

- The inclusion of auditing requirements highlights the Philippines' commitment to data and reporting integrity within the EPR system.
- In 2024, the DENR published interim guidelines on reporting and auditing, with more comprehensive standards still under development.
- These standards will include:
 - A standardized compliance auditing manual for the EPR Act of 2022.
 - A system for the accreditation of independent third-party auditors.
- Stakeholders (OEs, PROs, and others) seek further guidance on the report structure and tailored requirements based on the type of reporting entity; acceptable waste diversion certificates and their auditing process.

Case Study: Philippines

Source: PCX Solutions (2024): [PCX Solutions \(2024\): https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03eb228.pdf](https://a0971afe-cb6d-41c9-a34a-81a6731b8e5c.usrfiles.com/ugd/a0971a_ea63e367cc2c49eabf22fc03eb228.pdf)



Indonesia EPR scheme

Legal Frameworks and Implementation for Plastics and Packaging

Case Study: Indonesia

Background:

Indonesia faces significant plastic waste management challenges, with 57% of post-consumer plastic packaging waste left uncollected in 2019. The country implemented an EPR roadmap in 2019, targeting a **30% reduction in product and packaging waste by producers by 2029**.

- The EPR guideline is based on the **Ministry of Environment and Forestry of Indonesia (MoEF) Regulation No. 75/2019**.

MoEF Regulation No. P.75/2019 – Specifications:



Manufacturing: Food and beverage industry, other consumer goods industry, cosmetics and personal care industry



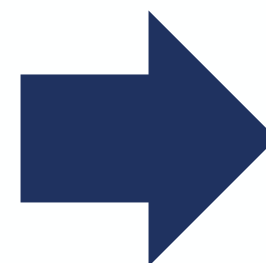
Food and beverage services

Diners, cafes, restaurants, catering services, hotels



Retail

Shopping centers, modern stores, traditional markets



Preventing and limiting potential waste generation by implementing sustainable design, phasing out SUP, producing more durable, etc.

Taking back post-consumer products and packaging for reuse and/or recycling

For the purpose of **data collection and system evaluation**, during the registration process the producers are required to provide information on:

- company identity
- field of work
- put-on-market (POM) data and other quantitative data.
- They must also submit a planning document to the Ministry of Environment and Forestry, which should at the very least contain: baseline conditions, targets for waste reduction/recycling/reuse, and take-back plans for their products.



Source:

ERIA (2024); <https://alpha.rkcmpd-eria.org/extended-producer-responsibility/legal-framework/Indonesia>

Case Study: Indonesia



Roadmap - Mechanisms of Implementation:

- ▶▶ **Planning:** Submitting a strategic plan for waste reduction, which comprises information on the baseline of current waste generation, targets and timeline for waste reduction, targeted products, and measures taken to implement waste reduction.
- ▶▶ **Implementation:** Achieving waste reduction targets through activities stated in the submitted strategic plan.
- ▶▶ **Monitoring:** Monitoring the type and number of products and packaging produced and/or used and reduced as well as the measures implemented to achieve it. The monitoring shall be conducted on a bi-annual basis at the very least.
- ▶▶ **Evaluations:** Comparing between waste reduction targets and achievements during the period and identifying challenges in the implementation.
- ▶▶ **Reporting:** Submitting report on the type and number of raw materials reduced, biodegradable packaging produced, etc.

Source:

ERIA (2024); <https://alpha.rkcmpd-eria.org/extended-producer-responsibility/legal-framework/Indonesia>

Case Study: Indonesia

Options for Producers to Organise Themselves



- **Voluntary PROs:** Example: IPRO, where producers collaborate to fund and coordinate recycling efforts.
- **Individual Responsibility:** Producers manage their own take-back and recycling schemes.
- **Public-Private Partnerships:** Producers partner with local governments and waste banks to enhance collection and recycling.
- **Collaboration with Informal Sector:** Producers leverage the informal sector's capacity for waste collection and recycling.

Challenges



- **Funding Gaps:** Limited financial resources for waste management infrastructure.
- **Coordination:** Lack of alignment between formal and informal sectors.
- **Compliance:** Ensuring producers meet ambitious recycling and waste reduction targets.

Source:

ERIA (2024); <https://alpha.rkcmpd-eria.org/extended-producer-responsibility/legal-framework/Indonesia>

Case Study: Indonesia

Key stakeholders in the EPR Scheme:

Government Bodies:

- Ministry of Environment and Forestry (MoEF): Leads the implementation of Regulation 75/2019 on the Waste Reduction Roadmap.
- Ministry of Public Works and Public Housing (PWPH): Develops waste management infrastructure like landfills and sorting centres.
- Ministry of Finance: Introduces fiscal measures like excise taxes on plastic packaging.
- Local Governments (Regencies and Cities): Operate waste collection and management systems.
- Coordinating Ministry of Maritime Affairs and Investment: Oversees marine plastic debris reduction under Presidential Regulation 83/2018.

Producers:

- Include manufacturers, food and beverage services, and retailers.
- Obligated to submit waste reduction roadmaps and implement 3R (Reduce, Reuse, Recycle) strategies.

Producer Responsibility Organisations (PROs):

- IPRO (Indonesia Packaging Recovery Organisation): A voluntary initiative for waste collection and recycling coordination.

Downstream Actors:

- Formal Sector: Local government-operated waste management systems.
- Informal Sector: Waste pickers and recyclers who recover high-value materials like PET bottles.
- Recycling Industry: Processes materials for reuse.

Consumers:

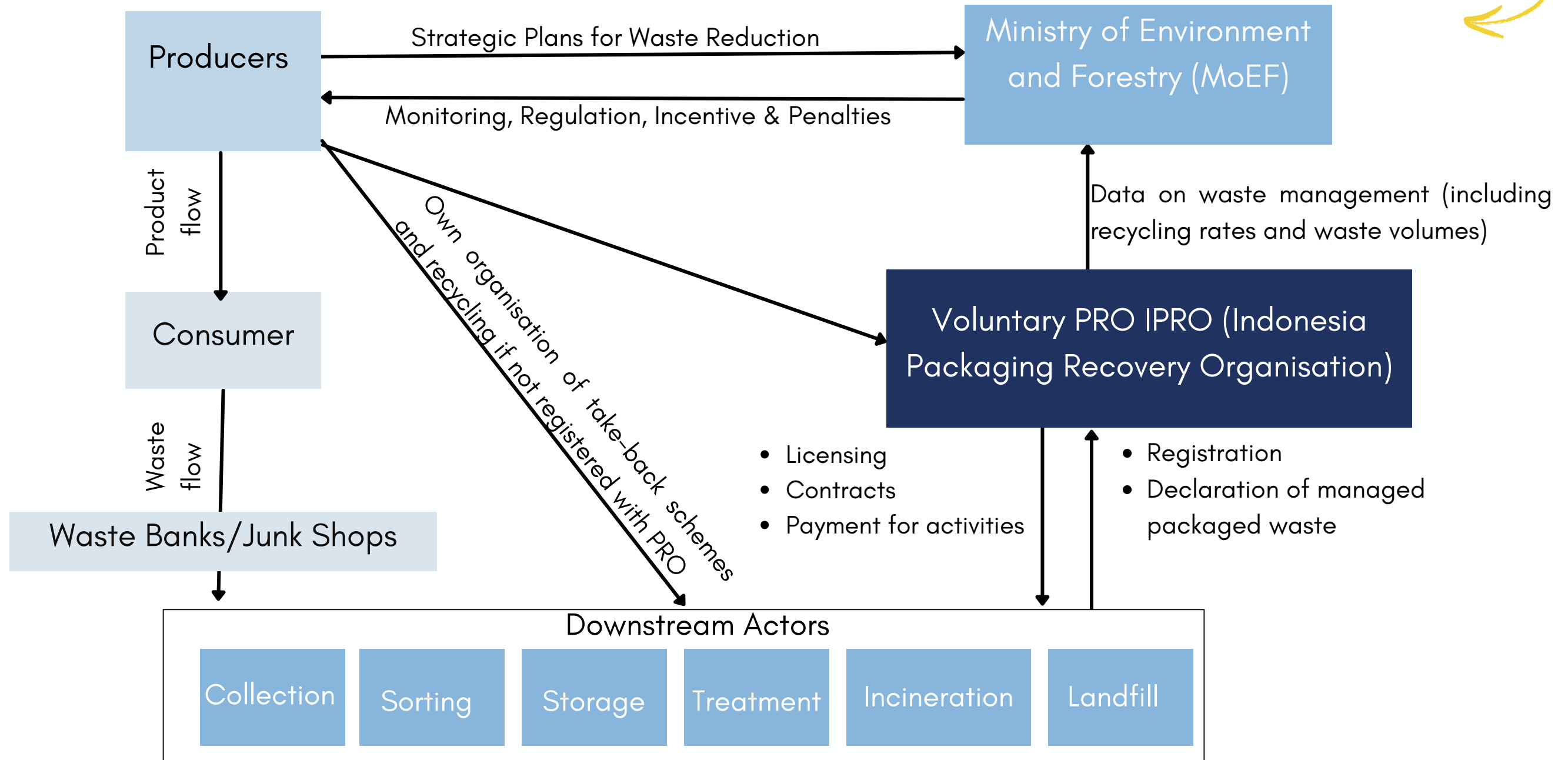
- Participate in waste separation and take-back schemes.

Source:

ERIA (2024); <https://alpha.rkcmpd-eria.org/extended-producer-responsibility/legal-framework/Indonesia>

Case Study: Indonesia

How does the EPR scheme in Indonesia look like?



Source:

ERIA (2024); <https://alpha.rkcmpd-eria.org/extended-producer-responsibility/legal-framework/Indonesia>

Malaysia EPR scheme

Legal Frameworks and Implementation for Plastics and Packaging

Case Study: Malaysia

Background:

In Malaysia Five Year Plan (2021 – 2025) importance of CE is recognized, gradual introduction of EPR scheme as a component to transition to CE.

- The Solid Waste and Public Cleansing Management Act 2007 (Act 627) regulates waste management but does not specifically address SUP reduction
- Malaysia's Roadmap Towards Zero Single Use Plastics 2018–2030 aims to guide the country towards eliminating SUPs
- High-value recyclable packaging is already sorted from household waste with sufficient recycling capacities;
- Low-value and non-recyclable plastic packaging are disposed of and mixed together.

Stakeholders:

Multi-Stakeholder Engagement via Malaysia Plastic Pact (MPP) platform:

a multi-stakeholder platform of both public and private stakeholders in the plastic value chain, EPR working group in order to refine the EPR implementation with specific national condition.

PRO – Malaysian Recycling Alliance Berhad (MAREA):

a voluntary PRO which is supported by several multi-national companies. They target PET, HDPE, UBC and flexibles.



In the Future:

- The voluntary PRO will be organized as mandatory PRO
- All stakeholders will be properly engaged by creating an explicit legal framework and registration scheme



Implementation Timeline: by 06/2025: Legal EPR scheme rollout, voluntary PRO transformed into mandatory PRO.

Source:

Kamaruddin, H. ., & Marwan, M. A. . (2021); <https://cibgp.com/au/index.php/1323-6903/article/view/877>

Case Study: Malaysia

Transition from a voluntary to a mandatory scheme:

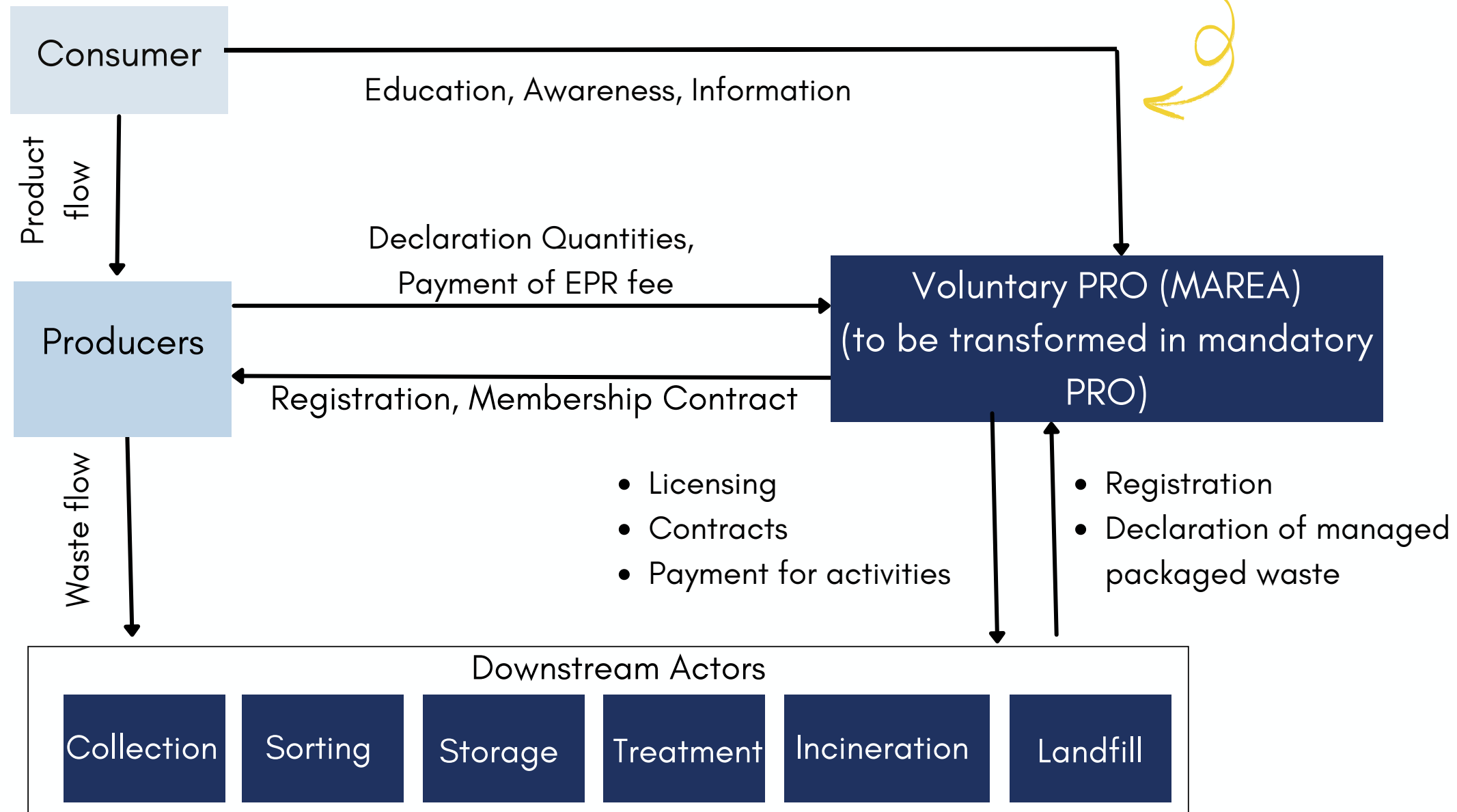
EPR Scheme	Process	Description
Voluntary Scheme (2021 – 2025)	Inception of voluntary EPR (2021 – 2022)	• Preparation for EPR adoption and readiness through advocacy and capacity building programmes conducted collaboratively by the government, industry associations, and relevant organisations. • Development of EPR governance framework to ensure a seamless transition from a voluntary to a mandatory EPR scheme.
	Adoption of voluntary EPR (2023 – 2025)	• Introduction of a nationwide voluntary EPR scheme, with the expectation of active industry participation.
Mandatory scheme (2026 onwards)	Implementation of mandatory EPR for packaging	• Full implementation of mandatory EPR for packaging, with industries contributing to eco-modulated fee, which will fund the operational cost of the scheme, overseen by an independent PRO.

Source:

Kamaruddin, H. ., & Marwan, M. A. . (2021); <https://cibgp.com/au/index.php/1323-6903/article/view/877>

Case Study: Malaysia

How could an EPR scheme in Malaysia look like in the future?



Source:

Kamaruddin, H. ., & Marwan, M. A. . (2021); <https://cibgp.com/au/index.php/1323-6903/article/view/877>

Case Study: Malaysia

Recommendations for the future mandatory EPR scheme:

Clear setting of quantitative targets for collection and recycling of each packaging stream

Clear outline of stakeholders and their responsibilities (with a similar chart like the one presented)

Explicit mentioning of the producers and importers obliged to pay the EPR fee

Creation of information system and reporting platform for packaging waste

Setting fines and penalties for obliged producers that fail to fulfil their responsibilities

Integration of the informal sector

Source:

Kamaruddin, H. ., & Marwan, M. A. . (2021); <https://cibgp.com/au/index.php/1323-6903/article/view/877>

Dominican Republic EPR scheme

Step-by-step introduction of a mandatory EPR scheme

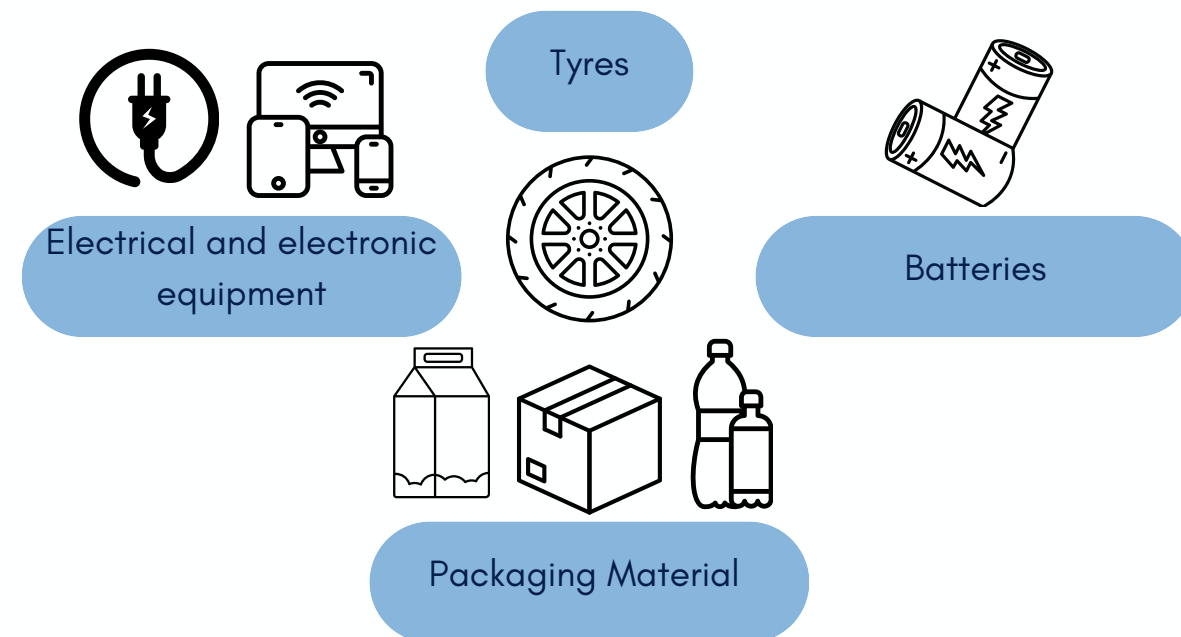
Case Study: Dominican Republic

Background:

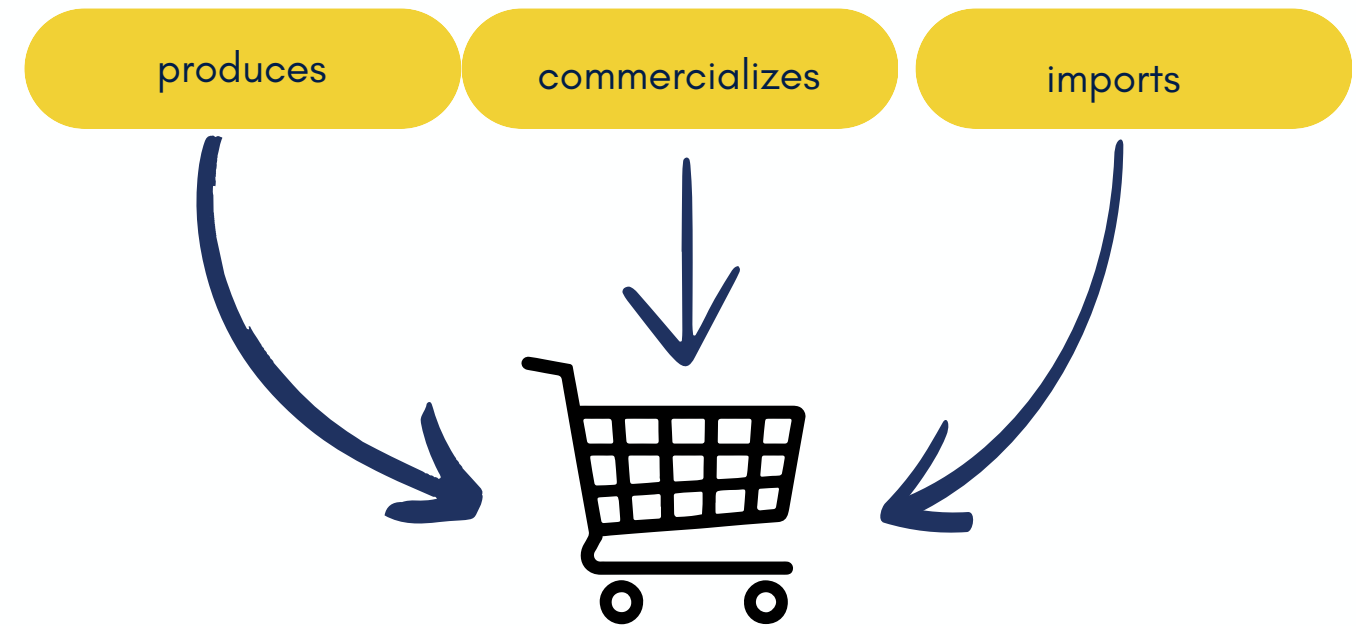
The Dominican Republic has taken significant steps towards sustainable waste management through the **introduction of Law No. 225-20**. The law aligns with global trends in adopting EPR to promote shared responsibility among producers, merchants, and importers.

→ The regulation under Law No. 225-20 is part of broader efforts to transition to a circular economy. It seeks to reduce environmental impact by holding producers accountable for the lifecycle of their products.

Law No.225-20 - Product Specifications:



Producer



Art. 4 of Law 225-20, Clause 25: Producer of a Priority Product

A producer of a priority product is defined as a person who, regardless of the form of commercialisation:

- Sells a priority product for the first time on the national market.
- Sells a priority product under their own brand that was acquired from a third party who is not the first distributor.
- Imports a priority product for their own professional use.

Source:

El Dia (2025); <https://eldia.com.do/consulta-exige-responsabilidad-a-productores/>

Case Study: Dominican Republic

Criteria for Selecting Priority Waste:



Waste generated from mass consumption



Significant volume of waste generation



Waste that is difficult to treat or dispose of



1

Legislative Foundation (2020 - 2022)

- October 2020: Law No. 225-20 was enacted, establishing the framework for integrated waste management and introducing the principle of Extended Producer Responsibility (EPR).
- 2022: Preliminary drafts of regulations and technical guidelines were prepared.

2

Public Consultation (April 2025)

- April 30, 2025: The Ministry of Environment officially launched the public consultation process for the draft General Regulation on EPR to gather feedback from stakeholders to refine the regulation. The consultation will remain open for 45 days, ending in mid-June 2025.

3

Finalisation and Enforcement (Mid 2025)

- Following the public consultation, the Ministry of Environment will consolidate feedback and finalise the EPR regulation.

4

Implementation and Monitoring (Planned for Late 2025-Onward)

- Launch of systems for producer registration, online reporting, and waste collection.
- Initial focus on priority waste streams (electronics, batteries, tyres, and packaging).

Source:

Codoca (2023); <https://codoca.gob.do/wp-content/uploads/2023/12/REP-y-ley-225-20.pdf>

Case Study: Dominican Republic

Producers, importers, or merchants of goods must implement at least one of the following measures to mitigate or compensate for their environmental impact:

Establish an effective programme for recovery, reuse, recycling, energy recovery, or other valorisation methods for waste derived from the use or consumption of their products across the national territory.

Participate in a sectoral programme based on the type of waste or its nature, to ensure integrated management, whether organised by sector or product.

Develop products or use packaging that, through their design, manufacturing, or use, minimise waste generation, facilitate their valorisation, or allow for disposal in the least harmful way to health and the environment.

Establish strategic alliances with municipalities to improve waste collection and integrated waste management systems.

Producers can organize themselves in 2 different ways:

Individual: Direct contracting with authorised and registered waste managers.



Collective: Incorporation into a legal entity established exclusively for the management of waste from priority products.



Case Study: Dominican Republic

What does already exist in terms of producer organization in the DR?

The Primer Sistema Integrado de Gestión de Residuos Voluntario de NUVI (NUVI's First Integrated Voluntary Waste Management System) is a voluntary initiative in the Dominican Republic that aims to manage recyclable materials, starting with plastic bottles (PET). This system is operated by RECOLECTIVA SAS under the NUVI PET programme. It represents a significant step towards creating a circular economy in the country by involving private sector stakeholders in waste collection and recycling efforts.

- **Voluntary Participation:** Unlike mandatory Producer Responsibility Organisations (PROs), NUVI operates on a voluntary basis, allowing producers, importers, and other stakeholders to join the initiative and contribute to its goals.
- **Supports EPR Goals:** Although voluntary, NUVI aligns with the principles of Extended Producer Responsibility (EPR) as outlined in Law No. 225-20, potentially serving as a model for future mandatory systems.

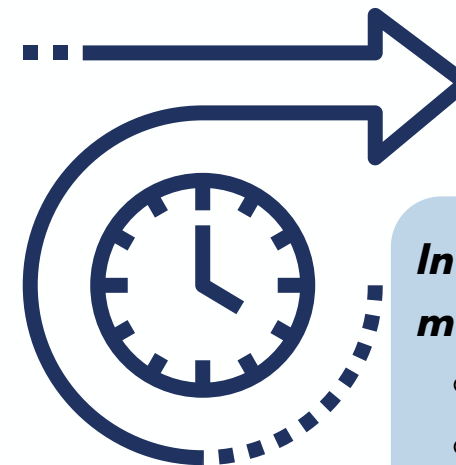
Source:

Codoca (2023); <https://codoca.gob.do/wp-content/uploads/2023/12/REP-y-ley-225-20.pdf>

Difference between the SIG and PRO



- **Legal Framework:** SIGs are often voluntary or sector-specific initiatives, while PROs are typically established to meet mandatory EPR regulations.
- **Scope:** SIGs may focus on specific sectors or waste streams (e.g., packaging or electronics), whereas PROs can operate across multiple sectors under broader EPR schemes.
- **Operational Structure:**
 - SIGs are more common in countries where voluntary or collective approaches to waste management are encouraged.
 - PROs often operate under stricter regulatory oversight and must meet recycling and recovery targets set by law.

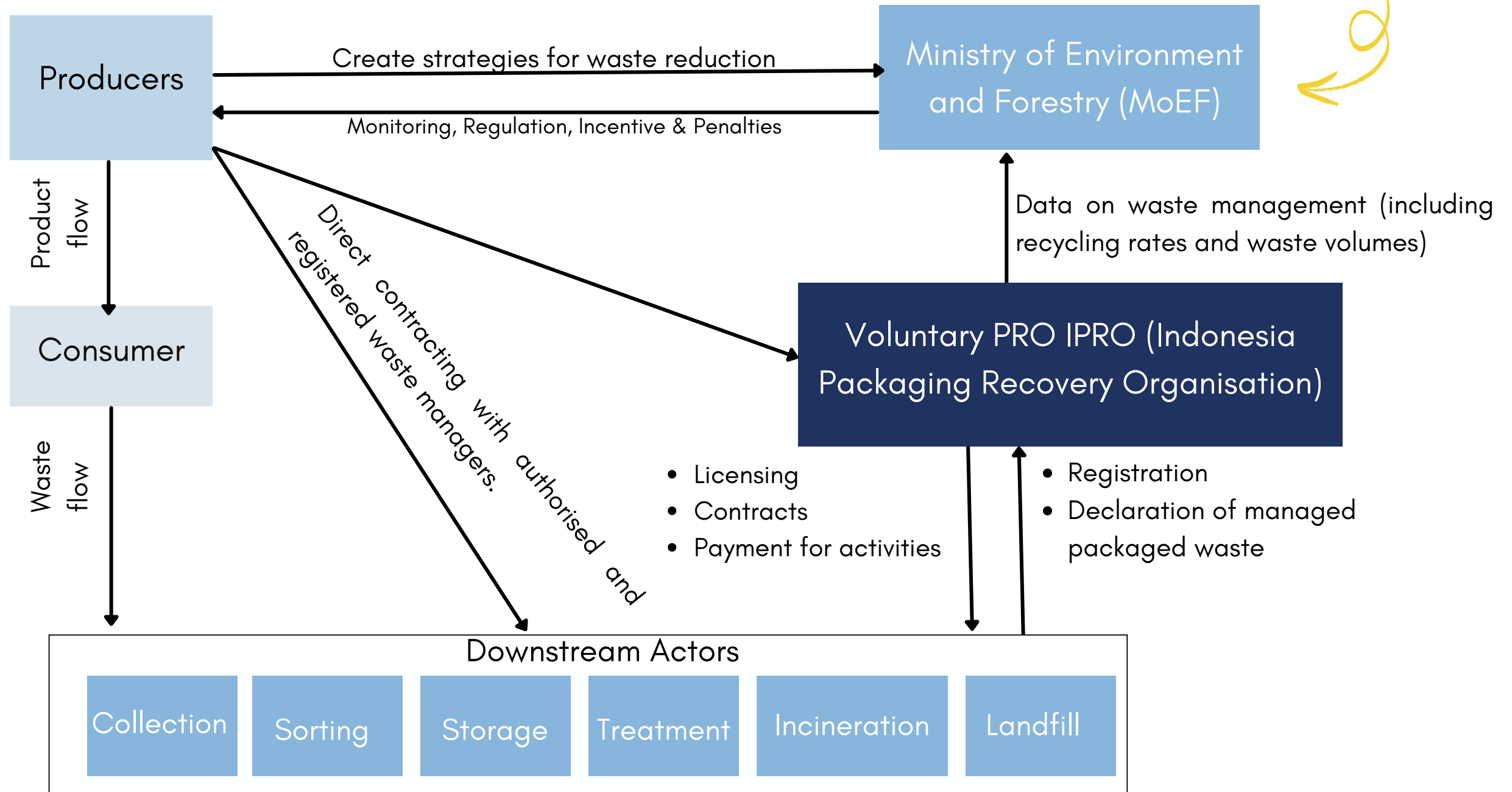


In the future the SIG ideally merges into a mandatory PRO by

- *formalising governance structures*
- *expanding scope*
- *securing authorisation*

Case Study: Dominican Republic

How could a future fully implemented mandatory EPR scheme in Dominican Republic look like?



Source:

Codoca (2023); <https://codoca.gob.do/wp-content/uploads/2023/12/REP-y-ley-225-20.pdf>

Deposit Refund System (DRS) in Palau

Mandatory 5-10¢ bottle deposit scheme tackling marine litter, led by government agencies.



Case Study: Deposit Refund System (DRS) in Palau

Palau's Deposit Refund System (DRS) was established under the Republic of Palau Public Law (RPPL No. 7.24) in 2006, with additional regulations in 2009. The system aims to address marine litter caused by tourism, which is both an economic driver and an environmental challenge.

How It Works:

- Importers pay a 5-cent disposal fee per PET bottle at customs, which goes into the Recycling Fund, managed by the Ministry of Finance (MOF).
- Consumers also pay a 10-cent deposit when purchasing bottles.
- When bottles are returned to Koror State Government (KSG) redemption centers, consumers receive a receipt.
- The receipt must be submitted to MOF for a 5-cent refund—the remaining 5 cents covers operational and administrative costs.
- Palau Waste Collection Company exports collected materials to Taiwan for recycling.

Challenges:

Limited recycling markets for exported materials.

Government-heavy responsibility, with minimal importer involvement.

Source:

adelphi (2023); https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

Table. Roles of Responsibilities in Palau's DRS. Source. Hawwa, (2016).

Responsibilities	Main Activities of the Deposit Refund System in Palau						
	Payment of Deposit		Collection of Deposit		Collection and returning of bottles	Receiving bottles and issuing refunds	Exporting
	Upon Import	Upon Purchase	Upon Import	Upon Purchase			
Economic	Importer pays \$0.05 per bottle	Consumer pays \$0.10 extra per PET bottle	Customs	Retailers	N/A	Importer & Consumer via deposits	Palau Waste Collection Company gets redeemed containers from the government & exports
Physical	N/A	Consumer	Customs	Retailers	Consumer	Financial State of Koror claims money from the Fund and issues refunds	Recycling Operator crushes and exports PET
Informative	Koror State Solid Waste Management Office						MPIIC export or find ways to export redeemed containers
Monitoring & Enforcement	Customs	Ministry of Public Infrastructure, Industries & Commerce (MPIIC)	Ministry of Finance monitors the collection fee and the deposit fund		Koror State Redemption Centre receives and monitors rate of bottles	MPIIC monitors redemption Centre	Ministry of Finance monitors the sales proceeds from exporting

South Africa's EPR scheme

From a voluntary to a mandatory EPR scheme for packaging



Case Study: South Africa

Characteristics	South Africa
EPR form	Mandatory monopolistic EPR scheme
Scope of material included	PET, polyolefins (PP, HDPE, LDPE and LLDPE), polystyrene, vinyl, glass, paper and metals
Costs for producers	Differing depending waste stream and PRO
Special Features	Transition from a voluntary industry-led EPR scheme to a mandatory scheme in 2021

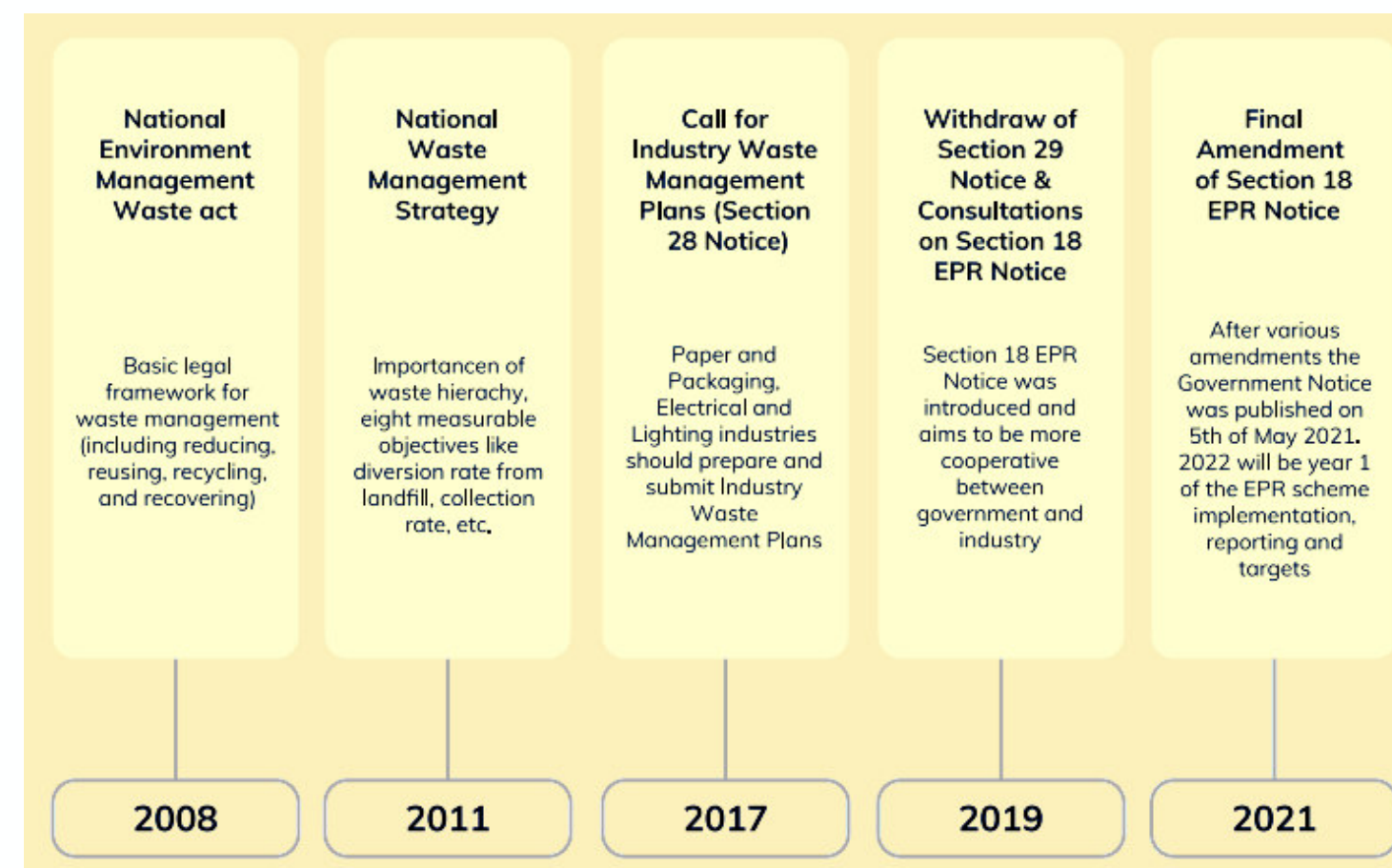
Source:

Facco et al. (2023):

https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

Legal Background

- **2008 Waste Act - Section 28** focused on EPR: required the paper and packaging, electrical and electronic and lightning industries to submit Industry Waste Management Plans for government review
- **Later Section 28 was replaced by Section 18:** Last amendment of section 18 was published on 5th of May 2021 and requires full EPR implementation for paper and packaging and some single-use products, electrical and electronic equipment and lightning.



Case Study: South Africa

From a voluntary to a mandatory scheme

In early years: voluntary industry-led scheme. In 2017 consultations on mandatory scheme began.

Shift Towards Mandate (2017): Government consultations began on making EPR mandatory, requiring key industries (Paper & Packaging, Electrical & Electronic, Lighting) to submit Industry Waste Management Plans (Section 28 Notice).

Initial Approach & Industry Concerns: EPR fees were initially collected by government and disbursed via the Waste Bureau. However, industry preference for managing funds and PRO-led disbursement led to the withdrawal of Section 28 in 2018.

Section 18 Framework & Implementation: A new cooperative model was introduced under Section 18, inviting industry participation in policy development. With the final amendments published on 5 May 2021, industries were required to register with DFFE and recognised PROs by 5 November 2021, with compliance options including joining existing PROs, forming new ones, or submitting individual EPR plans (Individual Compliance Schemes, ICS).

Source:

Facco et al. (2023):

https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

Case Study: South Africa

Obligated Industries

any person or category of persons, including a Brand Owner, who is engaged in the:



Obligations:

- Registration on DFFE South African Waste Information Centre (SAWIC)
- Establishment an EPR scheme or joining of an existing PRO where producers will be accountable for the performance of the scheme
- Conduction of a life cycle assessment in relation to the identified product by the November 2026 (unique aspect)
- Development a broad-based black economic empowerment charter by May 2023.
- Implementation of a mandatory take back of identified products where relevant as well as implement environmental labels for identified products

Source:

Facco et al. (2023): https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

Collection and Recycling targets for different product categories:

Product or class of Product	Year	Recycled Content	Collection Target	Recycling Target
Glass				
Non-alcoholic beverage (soft-drinks)	1	20%	46%	38%
	2	25%	53%	43%
	3	30%	58%	48%
	4	35%	65%	53%
	5	40%	65%	54%
Metal				
Aluminum (non-Ferrous/Used Beverage Cans)	1	24%	62%	30%
	2	28%	64%	32%
	3	32%	66%	33%
	4	36%	68%	34%
	5	40%	70%	35%
Plastics				
Plastic PET Beverage bottles	1	10%	60%	54%
	2	12.50%	64%	58%
	3	13%	66%	59%
	4	15%	68%	61%
	5	20%	70%	65%
Paper				
Magazine	1	n.a.	35%	33%
	2	n.a.	36%	34%
	3	n.a.	38%	36%
	4	n.a.	40%	38%
	5	n.a.	42%	40%

Case Study: South Africa

PRO Set-Up & Responsibilities

- **Before 2021:** PROs operated voluntarily, collecting voluntary EPR fees and grants
- **May 2021:** EPR Regulations published; EPR participation becomes compulsory
- **Key change:** PROs now collect mandatory EPR fees and must meet regulated targets

Collect EPR fees from producers members

Fund collection, sorting and recycling activities

Support awareness-raising and education

Work with informal waste pickers and enterprises of all sizes

Have to achieve 5-year regulated recycling and recovery targets

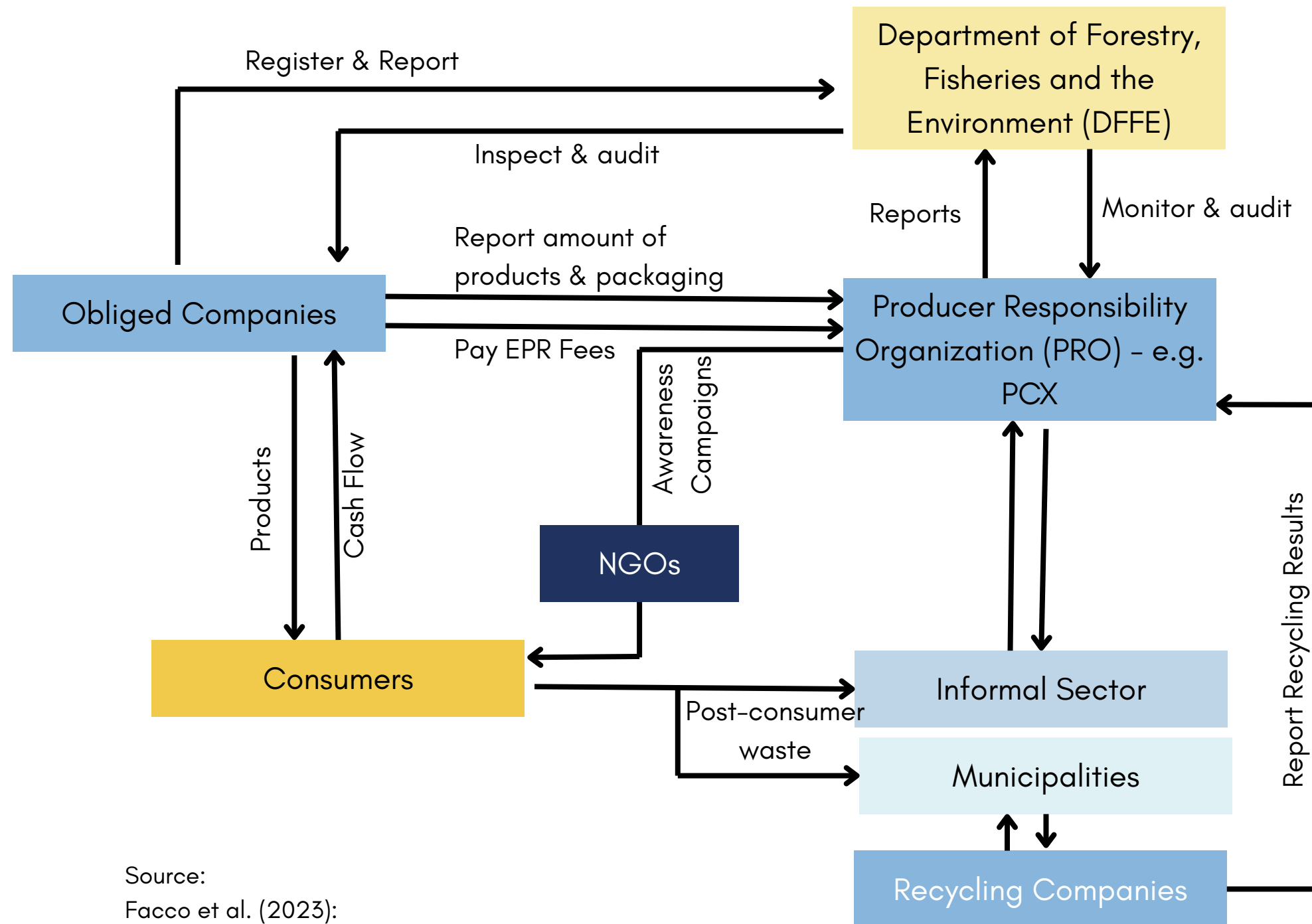
Source:

Facco et al. (2023): https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

Mandatory and industry-led PROs

PRO Name	Material Focus	Year Established	Website
PETCO	PET (bottles, containers)	2004	www.petco.co.za
POLYCO	Polyolefins (LDPE, LLDPE, HDPE, PP)	2011	www.polyco.co.za
EPSASA	Polystyrene (EPS, HIPS)	2007/2009	https://epsasa.co.za/
TGRC	Glass	2005	www.theglassrecyclingcompany.co.za
Fibre Circle	Paper, paper packaging, liquid packaging	2016	https://fibrecircle.co.za/
RecyclePaperZA	Newspapers, magazines, office paper, etc.	2003	https://www.thepaperstory.co.za/
METPAC-SA	Metal packaging (aluminium, steel, tinplate)	2017	www.metpacsa.org.za

Case Study: South Africa



Role of the informal waste collection sector:

- Informal waste reclaimers are essential for effective recycling in South Africa.
- EPR policies must include, not exclude, the informal sector, guided by the Waste Picker Integration Guidelines.
- Integration improves EPR efficiency and supports livelihoods but must respect reclaimers' autonomy.
- Sector representatives prefer fair, stable prices for materials over formalisation or a fixed wage.
- Hybrid payment models and stakeholder collaboration are key for successful, context-specific integration.

Source:

Facco et al. (2023):

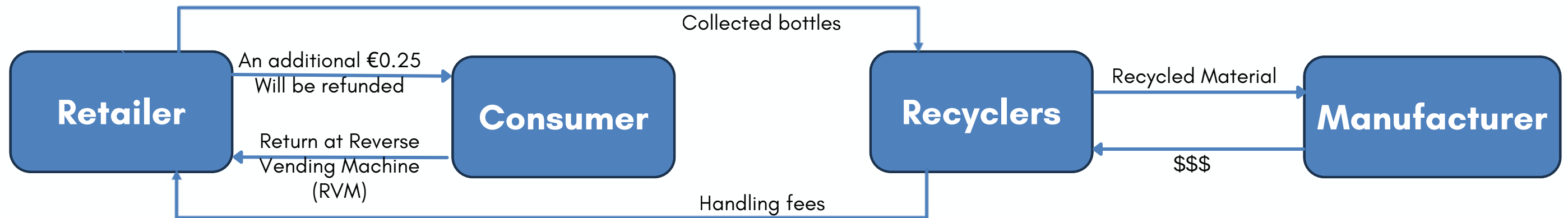
https://adelphi.de/system/files/document/Latest-EPRManual-14.02.23%20%28004%29_2.pdf

Germany's Deposit Refund Scheme (Pfand System)

**Mandatory, full deposit refund scheme
for single-use and reusable beverage containers.**

Germany's Deposit Refund Scheme (Pfand System)

Mandatory, full deposit refund scheme for single-use and reusable beverage containers.



Flow	Details
Deposit Collected	€0.25 per container is paid by consumer at point of sale.
Refund Paid	Upon return, full refund is given to consumer (automated or manual).
Unclaimed Deposits	Retained by the DRS clearing system operator (DPG) — ~2-3% containers are not returned. These funds support admin/logistics costs.
Retailers' Role	Must accept empty containers, regardless of where sold. They get compensated for handling via service fees.
Producers	Register all products with DPG (Deutsche Pfandsystem GmbH) and pay fees per item (~€0.01-0.03). Must also ensure design compatibility (e.g., scannable barcodes).

Germany's Deposit Refund Scheme (Pfand System)

Stakeholder	Role	Benefits
DPG (System Operator)	Manages registration, logistics, clearing , ensures compliance	System efficiency, earns from unclaimed deposits
Producers (Beverage Brands)	Register products, label with deposit barcode, pay fees	Access to market, sustainability credentials
Retailers (All Sizes)	Collect containers via reverse vending machines/manual	Increased foot traffic, retail compensation, consumer loyalty
Consumers	Return containers to reclaim deposit	Monetary refund, environmental participation
Recyclers	Receive sorted, clean materials	High quality input, supports circular economy
Logistics Firms	Handle collection and backhauling of containers	Business opportunity, eco-logistics sector growth
Government	Sets legal framework (Packaging Act, 2019 update)	High recycling targets met (97%), public support maintained

Germany's Deposit Refund Scheme (Pfand System)

What Makes Germany's System Work So Well?

- **Mandatory Participation** – No opt-out; applies to all producers and retailers selling covered beverages.
- **Convenient Return Options** – Over **130,000 reverse vending machines** installed nationwide.
- **High Refund Amount** – €0.25 is significant enough to ensure consumer compliance.
- **Central Clearing System** – DPG manages all transactions, barcode validation, and compliance.
- **Public Awareness** – Germans have grown up with the Pfand system; it's culturally embedded.
- **Uniformity Across Brands** – Standardized bottle types and barcodes simplify sorting and logistics.

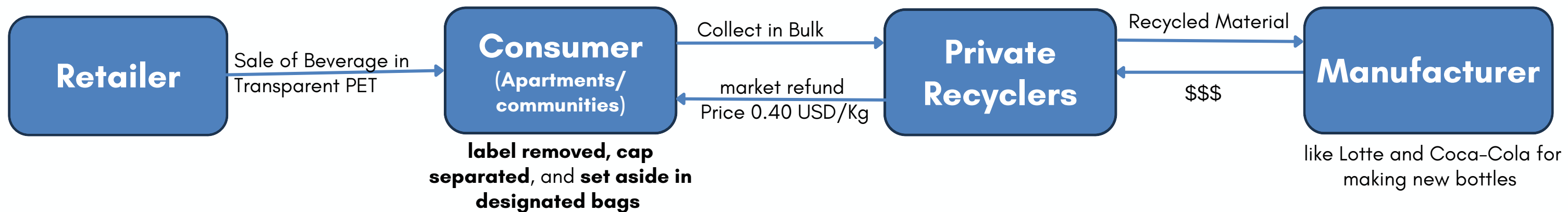
South Korea – Volunteer Refund for Transparent PET Bottles

Public-Private Collaboration for High-Value Plastic Recycling Without EPR Fees



South Korea – Volunteer Refund for Transparent PET Bottles

This system is not a full Deposit Refund Scheme (DRS) and does not apply EPR fees on PET manufacturers for this stream. Instead, it uses market-based financial incentives and voluntary cooperation of citizens and private sector.



Feature	South Korea PET Refund	Traditional DRS	EPR System
Refund given to	Apartment managers/collectors, not consumers	Consumers	Not applicable
Deposit collected upfront?	No	Yes	No
Producer fees involved?	No EPR fee on PET	Sometimes	Yes
Government fund involved?	No EPR fee on PET	Yes	Yes
Material quality emphasis?	High (clean PET only)	Medium	Low

South Korea – Volunteer Refund for Transparent PET Bottles

Stakeholder	Role	Incentives
Ministry of Environment (MoE)	Designs scheme, sets PET quality guidelines , monitors performance	Policy success, reduces landfill, meets recycling targets
Apartment Building Managers	Organize proper PET separation, educate residents , collect refunds	Extra income, cleaner facilities, community engagement
Residents (Consumers)	Separate bottles correctly , comply with clean sorting rules	Pride, community benefits, sometimes shared refunds
Recyclers	Buy transparent PET, sort, process into high-grade flakes	Reliable feedstock, premium prices, lower contamination
Brands/Manufacturers	Buy rPET from recyclers for bottle production	Green branding, compliance with circularity goals

South Korea – Volunteer Refund for Transparent PET Bottles

Partial Refunds Work Without Upfront Deposits

- A full DRS is not the only option. **If managed well**, partial refund incentives for clean sorting can drive high recovery.

Target High-Value Streams First

- South Korea focused on clear PET, which has strong resale value. This is a smart entry point **for countries lacking full DRS infrastructure**.

Apartment-Level Collection is Scalable

- Engaging building managers as intermediaries allows **localized control, peer enforcement**, and better material quality.

No EPR Fee Doesn't Mean No Responsibility

- Brands benefit from participating in a circular loop **without paying EPR fees**, but are still incentivized to use local rPET.

Voluntary Public-Private Models Can Be Sustainable

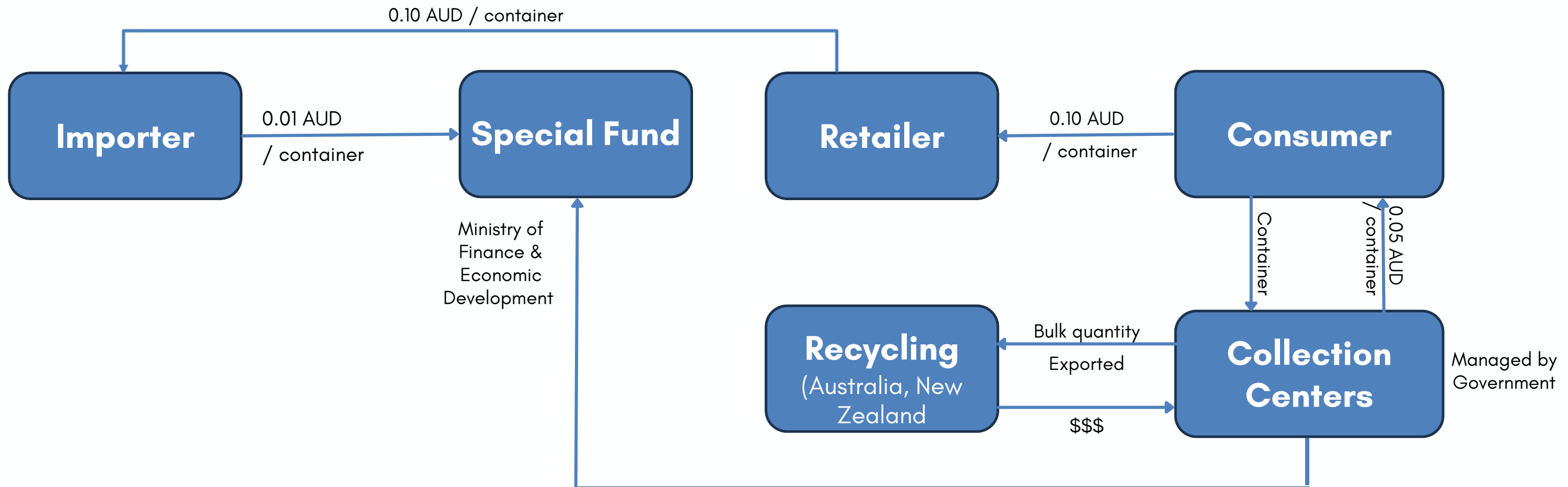
- **No central government subsidy** is required if the value of the material supports a market-driven refund.

Kiribati's – Partial Deposit Refund System

Based on a partial refund system



Kiribati's – Partial Deposit Refund System



Portion	Who Gets It	Purpose
0.05 AUD	Refunded to consumer	Incentive for proper return
0.05 AUD	Retained by government fund	Funds waste management operations (buy-back center, shipping, sorting, administration)

Kiribati's – Partial Deposit Refund System

Financial Breakdown – Costs vs. Revenue

Category	Description	Typical Range (AUD)
Collection & Sorting	Cost of buy-back staff, logistics, baling	\$100–200 per ton
Shipping & Export	International container shipping (remote islands → port → recycler)	\$200–500 per ton
Administration	Staff, enforcement, public awareness	\$50–100 per ton
Total Operational Cost	Per ton of recyclables exported	~\$600 per ton

Source	Description	Typical Range (AUD)
Unclaimed Deposits	Containers not returned (approx. 10–20%)	~\$400 per ton
Material Sales	Sale of baled recyclables to foreign buyers	~\$300 per ton depending on market
Donor/Project Support	Some years have donor support for equipment or transport	(e.g., JICA, UNDP)
Deposit Retention	5 cents retained per returned container	~60% of total deposit collected ~\$750 per ton
Total Revenue	Per tons of recyclables	~\$1450 per ton

ASSUMPTION: Per ton 25,000 Empty PET bottles

Kiribati's – Partial Deposit Refund System

Make the Refund Amount Attractive

- If too small, consumers ignore it. If too large, it burdens businesses.

Infrastructure Must Match the Ambition

- Accessible return points (reverse vending machines, kiosks, stores).
- Efficient tracking and logistics systems (barcode systems, digital apps).

Clearly Define Stakeholder Roles

- Importer: Upfront cost to ministry as Special Fund (then pass this cost to retailer > Consumer)
- Governments: Regulate, monitor and enforce.
- Consumers: Return packaging for a refund.

Financial Sustainability Requires Pooled Funds

- Unclaimed deposits, partial retains fees, and fines can fund system operations.

Avoid Loopholes and Fraud

- Robust tracking to prevent counterfeit returns or multiple refunds.
- Tamper-proof labelling and barcoding.

Tailor System to Local Context

- Informal waste sector integration is critical in the Global South.
- Mobile apps and cashless refunds can bypass logistical challenges.

Single-Use Plastic Ban in Vanuatu

Phased ban on single-use plastics since 2018 to reduce marine litter



Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban

Vanuatu, an archipelago of about **80 islands in the South Pacific Ocean**, introduced one of the world's most comprehensive **bans on single-use plastics** in response to **growing marine litter and environmental degradation**.

Phase 1 (2018): Plastic shopping bags, Drinking straws, Polystyrene takeaway containers



Phase 2 (2020): Plastic plates and cutlery, Plastic food containers, Egg cartons, Plastic flowers and plastic packaging for fruits/vegetables



Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban

Legal Framework

- Implemented through **Environmental Protection Orders (EPOs)** under the **Waste Management Act**.
- Enforced by the **Department of Environmental Protection and Conservation (DEPC)**.

Regulatory Mechanisms

- Retailers were given a **transition period** to comply.
- **Importation and local production of banned** items were prohibited.
- **Spot checks and inspections** conducted by the **DEPC and Customs**.

Alternative Products

- Encouraged use of **biodegradable alternatives** such as banana leaves, paper bags, and woven baskets (traditional '*nambas*').

Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban

<u>Stakeholder</u>	<u>Role</u>
Government (DEPC, Customs, Ministry of Trade)	Policy design, enforcement, public awareness
Local NGOs (e.g., VESS – Vanuatu Environmental Science Society)	Public education campaigns, citizen engagement
Private Sector (retailers, importers)	Compliance, shift to eco-friendly alternatives
Communities & Traditional Leaders	Promoted local alternatives and cultural practices
Schools and Youth Groups	Environmental education, awareness drives
Regional and International Partners	Technical support, funding (e.g., SPREP, UNDP, EU)

Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban

Challenges Faced

Lack of Alternatives: Initial shortage of affordable and accessible eco-friendly alternatives.

Solution: Promoted and subsidized local production of alternatives (e.g., coconut leaf packaging).

Public Resistance & Behavioral Change: Resistance from vendors and consumers accustomed to plastics.

Solution: Nationwide education campaigns and active involvement of youth and communities.

Enforcement Capacity: Limited human and financial resources for enforcement.

Solution: Partnered with local councils, customs officers, and trained inspectors

Import Dependency: Difficulty in controlling imports of banned plastics.

Solution: Tightened border control and updated customs codes.

Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban

Key Learnings & Takeaways for Other Island Nations

- **Start Small, Scale Gradually:** Vanuatu began with high-impact items and expanded gradually to manage resistance and ensure smoother transition.
- **Leverage Cultural Practices:** Traditional alternatives like leaf-wrapping were promoted, cultural pride can be a powerful enabler.
- **Community Ownership:** Engage local communities in both policy-making and implementation to ensure buy-in.
- **Regional Cooperation:** Collaborate with other island nations and international partners for technical and financial assistance.
- **Education is Key:** Awareness campaigns in schools, villages, and urban centers can drive behavior change.

Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban

10 commonly banned single-use plastic items

Plastic Straws Paper straws Metal straws (reusable) Bamboo straws	Plastic Cutlery (spoons, forks, knives) Wooden or bamboo cutlery Edible cutlery (e.g., made from rice, wheat) Stainless steel cutlery (reusable)
Styrofoam/plastic Plates and Bowls Areca palm leaf plates Sugarcane bagasse (biodegradable) Reusable ceramic or metal dishes	Plastic Stir Sticks Wooden stirrers Bamboo stir sticks Reusable stainless steel or silicone stirrers
Plastic Beverage Cups Paper cups with compostable lining Reusable metal or glass cups Bamboo fiber cups	Plastic Shopping Bags Cloth or jute bags Paper bags Biodegradable leaf/jute based bags
Plastic Food Containers (takeaway) Compostable containers made from sugarcane Aluminum containers (recyclable) Reusable tiffin boxes	Plastic Water Bottles Glass bottles Stainless steel bottles Plant-based bioplastic bottles
Plastic Packaging Film/Wrap Beeswax wraps Compostable cling film (PLA-based) Reusable silicone wraps	Plastic Cotton Swabs (with plastic stems) Cotton swabs with paper stems Bamboo cotton buds Reusable silicone swabs

Case Study: Vanuatu – A Pioneer in Single-Use Plastic Ban



Video Link:

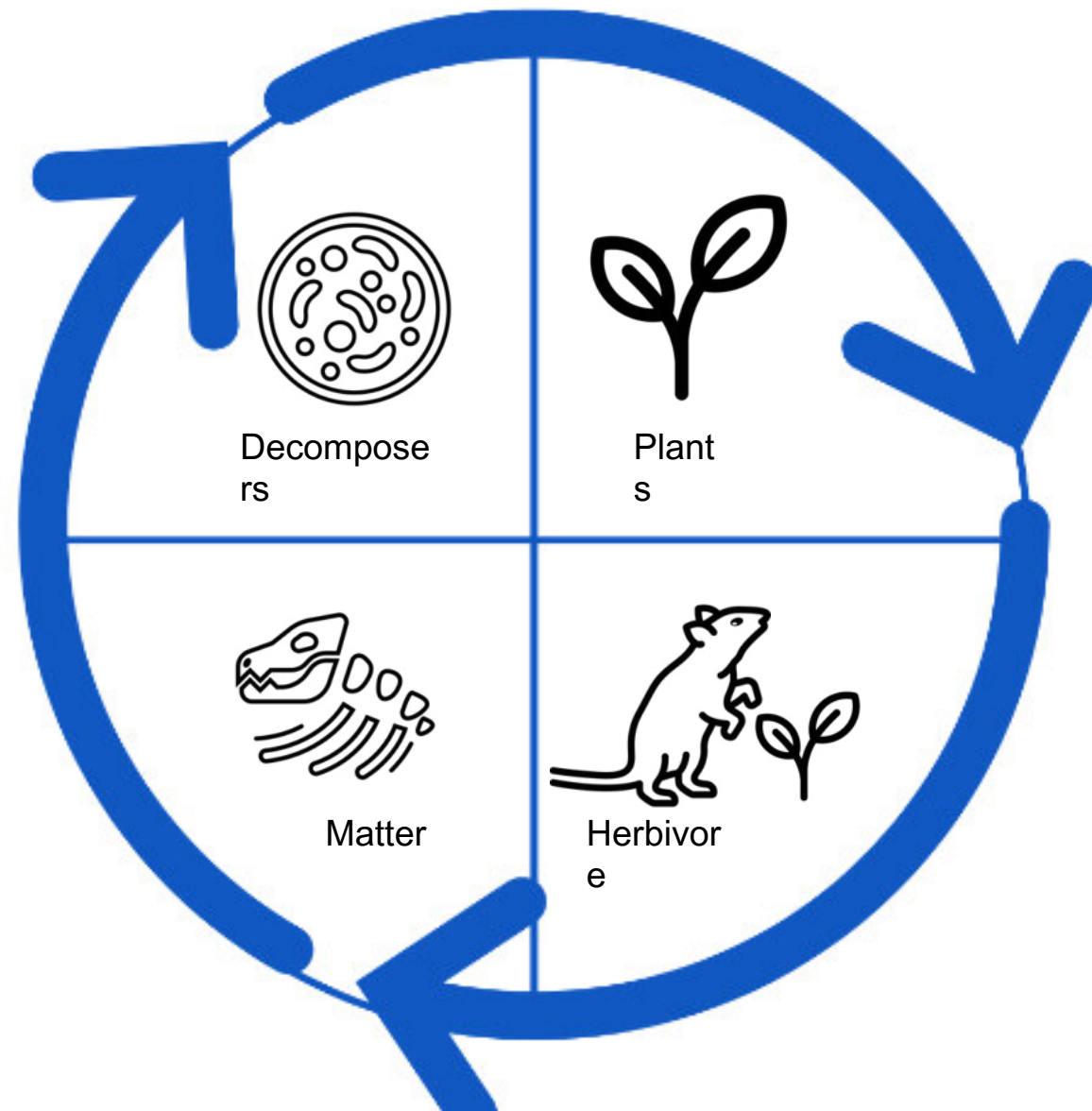
<https://www.youtube.com/watch?v=pB9CnjVI36U>

BBC REEL

Circular Business Models and Ecosystem



What is Circular Economy?



A circular economy is a system that tries to get the most value of the resources we have by keeping them at their highest utility, for as long as we can (Ellen MacArthur Foundation 2022).

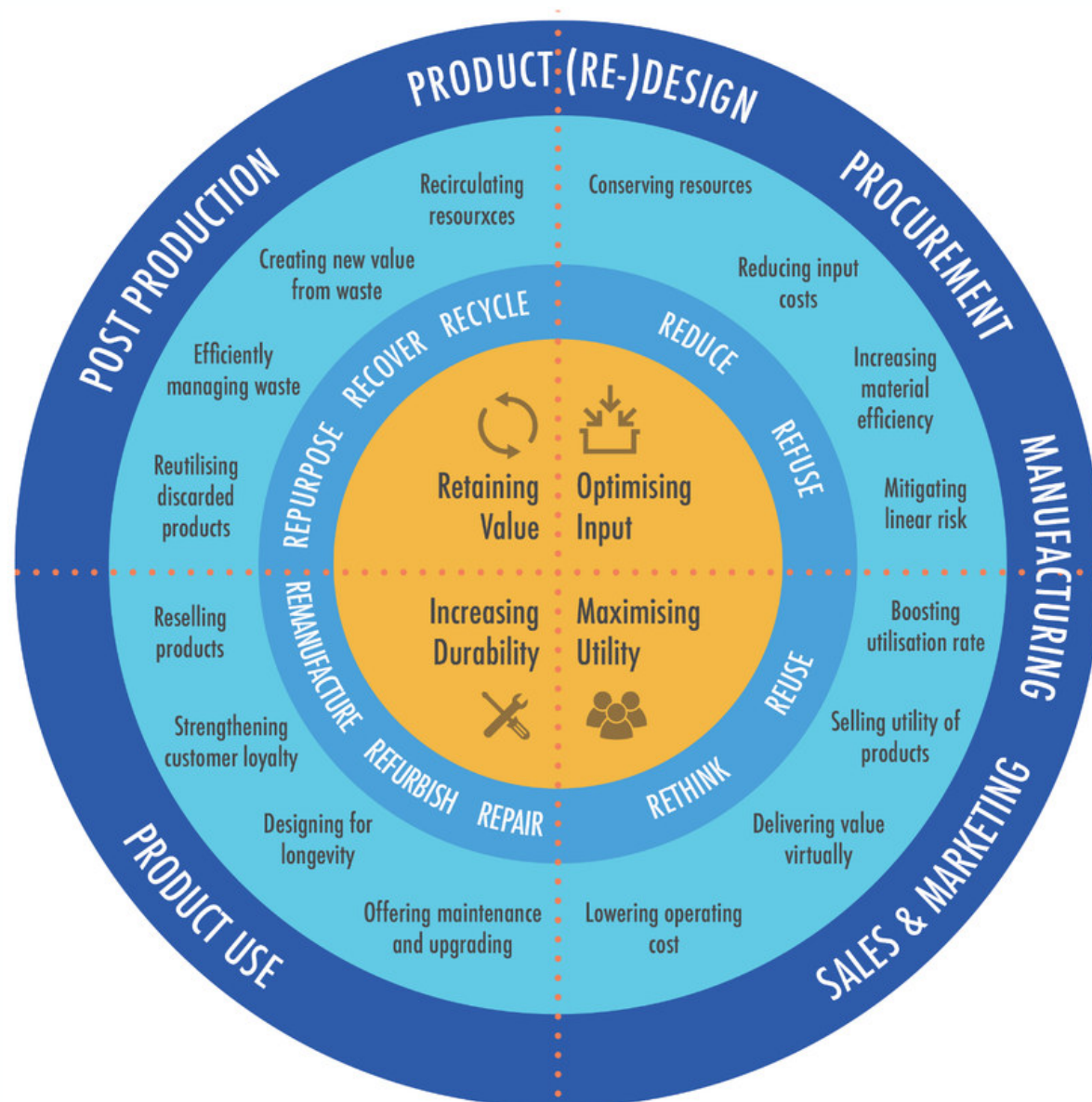
A circular economy is based on three principles: to eliminate waste and pollution, to circulate products and materials (at their highest value) and to regenerate nature (ibid).

How does circularity work? – let us look at nature

- Our economic system has to learn from nature. In nature, there is **NO WASTE**. The “waste” of one system becomes a resource for another. Everything is disassembled and reused. In nature, everything has a function without ever contaminating.
- Living organisms require a variety of nutrients and trace elements to sustain life. The nutrients from the soil are taken by a plant to grow. Plants become a source of food for herbivores, which at the same time are a feeding source for predators. If an organism dies, it becomes food for decomposers in the soil that transform the matter into new nutrients for new plants to grow. This process is known as a **circular system**, in which all matter continuously moves and transforms, but never turns to ‘waste’.

What is Circular Economy?

Circular Economy Business Opportunities – Circular Economy Taxonomy



Business Value Chain

Circular Business Case

Circular Business Channel

Added Circular Business Value

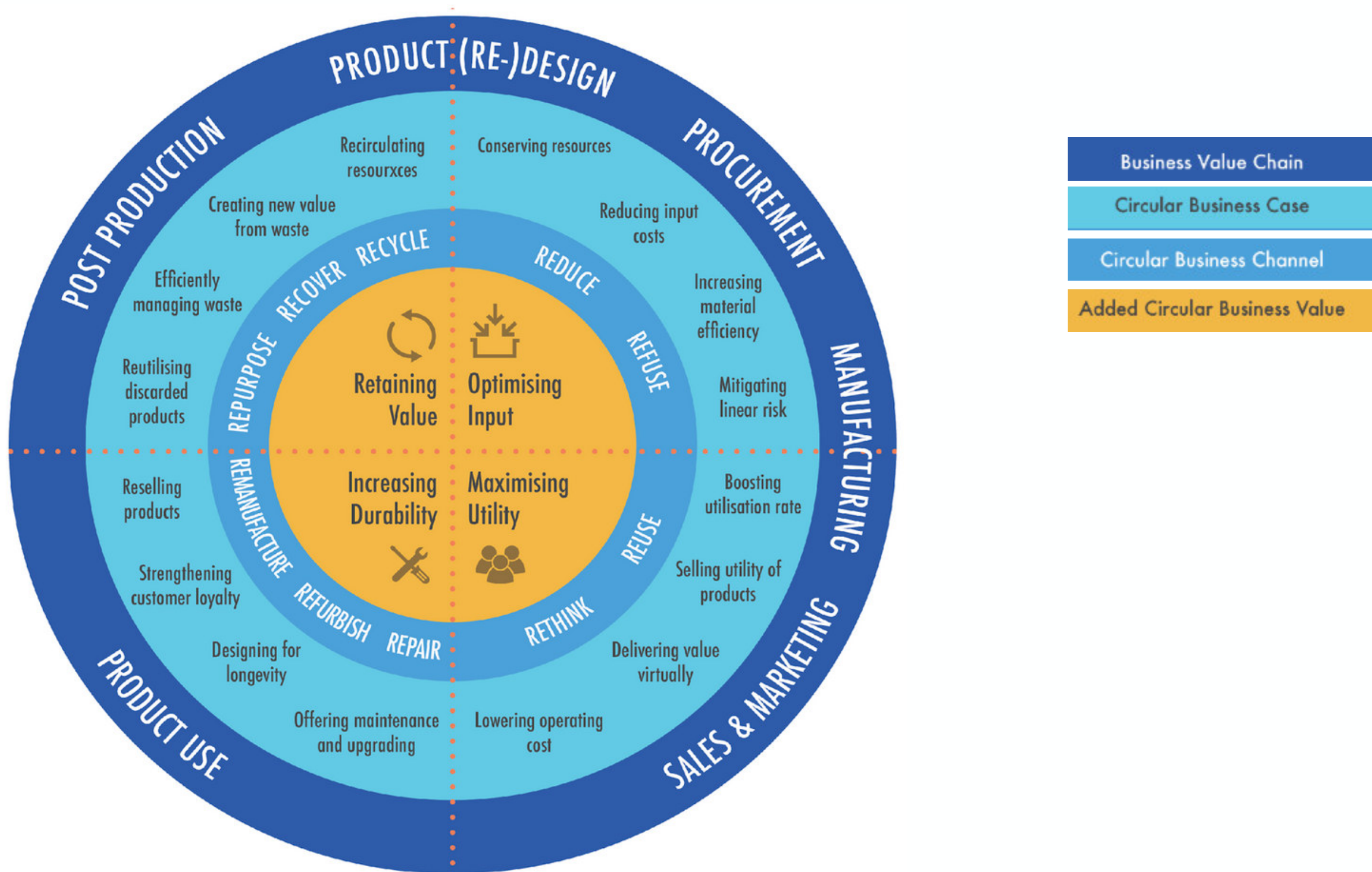
What are circular business opportunities?

There are a myriad of ways in which a business can create positive economic benefits by going circular. Take a look at the **Circular Economy Taxonomy** on the left: what you see is a collection of pathways that enterprises can take to achieve their goal of circularity.

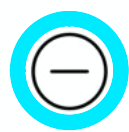
- Starting from the inside, the four orange quarters represent the **circular business values** that are inherent in each circular measure you may take. If you, for example, decide to open a used smartphone shop, you effectively increase the durability of the phones by refurbishing broken ones that would otherwise have reached the end of their product life.
- One step outward, the taxonomy shows you which **channels** you may take to turn a circular business value into action. In the phone shop example, you would repair or refurbish old smartphones.
- One step further outward you find the **circular business cases**. These represent the actual revenue-generating activities you engage in with the channels you chose. Your smartphone shop would only generate income by reselling their refurbished products.
- The outermost layer of the taxonomy regards the **business value chain** in which your circularity activity most likely takes place. The used phone shop does not increase the circularity of a marketing process, but rather affects how (long) a product is used.

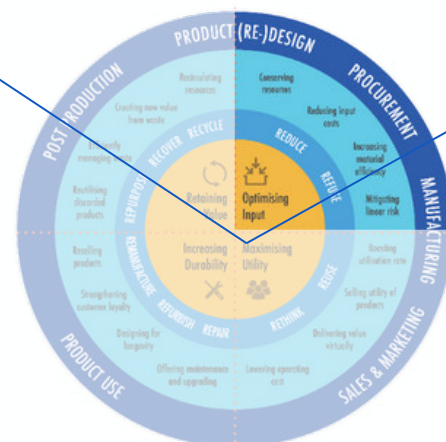
The Circular Economy Taxonomy is a core concept of this toolkit and referenced multiple times in the TOOLS ahead.

What are Circular Economy-related Business Opportunities?



Circular economy business opportunities – Optimising Input

Added Circular Business Value	Optimising Input: Using less and more regenerative and safe resources directly translates into increased efficiency, lower production cost and a decreased dependency on global supply chains.			
Circular Business Channel	 Reduce	 Refuse		
Circular Business Case	 Conserving resources	 Reducing input cost	 Increasing material efficiency	 Mitigating linear risk
Business Value Chain	 PRODUCT (RE-) DESIGN	 PROCUREMENT	 MANUFACTURING	



REDUCE: Reducing involves **minimizing resource use and waste generation by designing products and processes** that require fewer materials and energy. This strategy aims to prevent waste before it occurs.

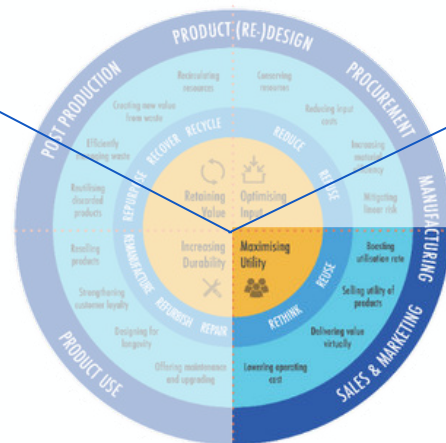
Startup Example: Too Good To Go is a mobile application that connects consumers with restaurants and stores offering surplus unsold food at discounted prices. By facilitating the sale of excess food that would otherwise be discarded, the app helps reduce food waste and promotes more efficient consumption patterns. <https://www.toogoodtogo.com/>

REFUSE: Refusing means consciously **opting out of products that are non-recyclable, single-use, or environmentally harmful**. This proactive choice helps reduce demand for unsustainable goods.

Startup Example: Loop offers a platform where consumers can purchase products in reusable packaging, effectively refusing single-use containers and promoting a zero-waste lifestyle. <https://exploreloop.com/en/>

Circular economy business opportunities – Maximising Utility

Added Circular Business Value	Maximising Utility: Making a product or service accessible to a more than a single user automatically intensifies the utility of the resources used to create it.			
Circular Business Channel	Rethink		Reuse	
Circular Business Case	Lowering operating cost	Delivering value virtually	Selling utility of products	Boosting utilisation rate
Business Value Chain	MANUFACTURING		SALES & MARKETING	



RETHINK: Rethinking involves **redesigning products and business models** to align with circular principles, focusing on sustainability and resource efficiency. It challenges traditional linear approaches to consumption and production.

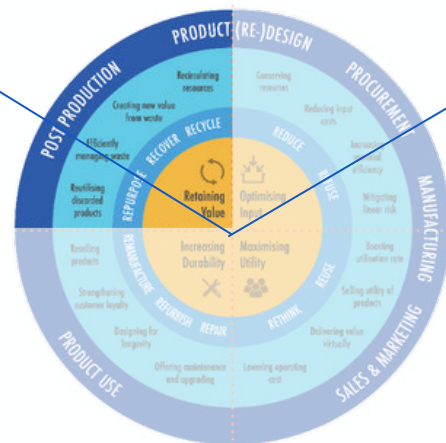
Startup Example: Fairphone – Modular Smartphones challenges the traditional smartphone industry by designing modular phones that are easy to repair and upgrade. This approach encourages consumers to rethink device longevity and reduces electronic waste by extending product lifespans.. <https://www.fairphone.com/nl>

REUSE: Reusing **extends the life of products by using them multiple times, either for their original purpose or creatively repurposed functions**. This reduces the need for new products and conserves resources.

Startup Example: Furlenco provides furniture rentals, allowing items to be reused by multiple customers, thereby reducing waste and the demand for new furniture production. <https://www.furlenco.com/>

Circular Economy Business opportunities – Retaining Value

Added Circular Business Value	Retaining Value: Starting to perceive waste as a resource, its value can be preserved by recirculating end-of-life resources into new product-life-cycles.			
Circular Business Channel	 Repurpose	 Recover	 Recycle	
Circular Business Case	 Reutilising discarded products	 Efficiently managing waste	 Creating new value from waste	 Recirculating resources
Business Value Chain	 POST PRODUCTION		 PRODUCT (RE-) DESIGN	



REPURPOSE: Repurposing gives a new function to products or materials that might otherwise be discarded, creatively extending their usefulness. This approach reduces waste and inspires innovation.

Startup Example: Rechakra transform discarded plastic bags and wrappers into woven products like bags, mats, and home décor. <https://www.recharkha.org/>

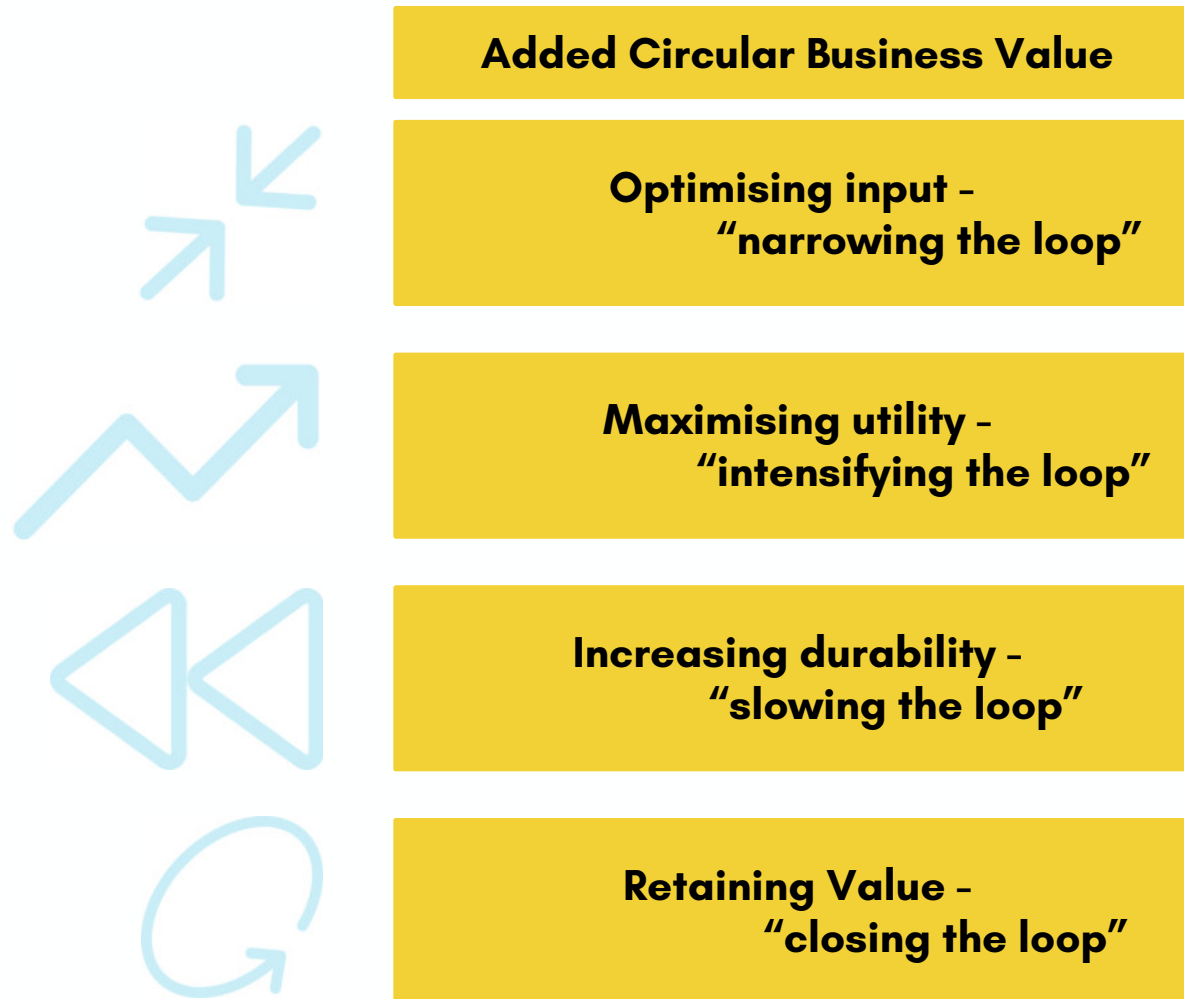
RECOVER: Recovery involves extracting useful materials or energy from waste that cannot be reused or recycled, ensuring that residual waste still contributes value. This minimizes the environmental impact of disposal.

Startup Example: Redwood Materials recovers valuable metals from used batteries, reintroducing them into the manufacturing cycle and reducing the need for virgin mining. <https://www.redwoodmaterials.com/>

RECYCLE: Recycling processes waste materials into new products, reducing the consumption of fresh raw materials and energy usage. It's a key component in managing waste and conserving resources.

Startup Example: EcoPost collects plastic waste and recycles it into durable plastic lumber used for fencing, furniture, and construction. <https://www.ecopost.co.ke/>

The Circular Economy Dimensions



To make a product, resources are used and their flows move in a production process. In the circular economy, the flow of resources is considered as a circle, the so-called "loop". Circular business models can alter the flow of resources within a production loop to minimize the resources entering the loop or keep the resources within the loop for as long as possible. Thus, circular economy brings **added-value** to businesses through **narrowing, intensifying, slowing or closing** the loop of resources (Weetman 2020).

- **Optimising input - "narrowing the loop"**: less resources are used to make a product or service, hence less resources enter the loop, and the narrower the loop is.
- **Maximising utility - "intensifying the loop"**: the more users a product/service reaches, the more use is made of the resources that went into making the product/service, thereby intensifying the reach of the loop.
- **Increasing durability - "slowing the loop"**: by keeping resources in the loop for as long as possible by repairing products or designing them to last for a longer period time, the flow of resources through the loop is slowed down.
- **Retaining value - "closing the loop"**: By recycling or recovering resources that have reached the end of their product life, the value of the resources is retained by redirecting them into a new loop and thereby closing the previous loop.

Circular Business Model Ecosystem Actors

Strengthening the uptake of **circular business models** requires coordinated efforts across a broad ecosystem of stakeholders.

Some relevant stakeholders and their **specific roles** in enabling and supporting circular business practices are:

Policymakers and Regulators	Startups and Entrepreneurs
Private Sector (Businesses and Industry Associations)	Technology Providers and Digital Enablers
Financial Institutions and Investors	Development Cooperation Agencies and International Organizations
Consumers and Civil Society Organizations	Municipal and Local Governments
Academic and Research Institutions	Business Development Service (BDS) Provider

Circular Business Model Ecosystem Actors & their roles – 1



Policymakers and Regulators

- **Develop supportive regulatory frameworks** (e.g., Extended Producer Responsibility, eco-design standards).
- **Provide incentives** (tax breaks, subsidies, green public procurement).
- Set **national circular economy strategies** and roadmaps.
- Facilitate **cross-sectoral coordination** and integration.



Private Sector (Businesses and Industry Associations)

- **Implement circular business models** (e.g., product-as-a-service, repair/refurbish, closed-loop recycling).
- **Innovate** in design, production, and logistics to reduce waste and extend product life.
- **Share best practices** and create industry coalitions for collective impact.
- **Invest in R&D** for circular technologies.

Circular Business Model Ecosystem Actors & their roles – 2



Financial Institutions and Investors

- Develop and offer **green finance products** (loans, equity, impact investment, blended finance).
- Assess **circularity as part of ESG** (Environmental, Social, Governance) **investment** criteria.
- Support SMEs and startups in transitioning to circular mode



Consumers and Civil Society Organizations

- **Drive demand** for sustainable and circular products and services.
- **Raise awareness and advocate** for transparency and accountability in business practices.
- **Participate** in reuse, sharing, and repair platforms.

Circular Business Model Ecosystem Actors & their roles – 3



Academic and Research Institutions

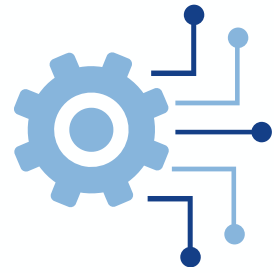
- Conduct applied **research on circular technologies** and models.
- Develop **training, curricula, and capacity-building** for future circular economy professionals.
- Collaborate with businesses on **innovation and piloting** solutions.



Startups and Entrepreneurs

- **Pioneer innovative** CBMs, often through digital platforms (e.g., sharing economy, B2B waste marketplaces).
- Disrupt linear business practices through agile **experimentation and localized solutions**.
- Low-cost , closed-loop, sustainable product & service innovation

Circular Business Model Ecosystem Actors & their roles – 4



Technology Providers and Digital Enablers

- **Offer digital tools** for product tracking, material flow analysis, reverse logistics, and waste management.
- Enable **data sharing & traceability** through blockchain, IoT, AI.
- Support **lifecycle assessments** and circularity performance measurement.



Development Cooperation Agencies and International Organizations

- **Fund pilot projects** & technical assistance for circular transition.
- Support **knowledge exchange, policy dialogues**, and regional cooperation.
- Facilitate capacity development & **public-private partnerships**.

Circular Business Model Ecosystem Actors & their roles – 5



Municipal and Local Governments

- Enable local **circular infrastructure** (e.g., recycling centers, repair hubs).
- Support local businesses and SMEs through **public procurement and incentives**.
- Implement urban policies that **promote zero waste** and **circularity** at city level.



Green Business Development Service (BDS) Providers

- Support startups and SMEs in **incubating & scaling** circular business models.
- Facilitate **access to markets, funding** opportunities, and partnerships.
- Help entrepreneurs navigate policy, **compliance, and certification**.
- Organize **hackathons, challenge funds, and innovation labs** to stimulate circular solutions.

Thank You!

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