

A Study on the Role of

EXTENDED PRODUCER RESPONSIBILITY

for Plastics Circularity in Thailand

Section 01

INTRODUCTION

While plastics are incredibly useful materials for modern life, excessive plastic production and waste generation have resulted in adverse environmental and social impacts globally.

The issue of plastic pollution has been increasing at an alarming rate, with the UNEP projecting that the amount of plastic waste entering aquatic ecosystems in 2040 will be 23-37 million tons per year¹. Estimates suggest that the Asia region is responsible for over 80% of plastic leakage into marine environments, with Thailand ranking in the top 10 plastic polluters globally despite having a relatively high waste collection rate².

The Government of Thailand has developed a Roadmap for Plastic Waste Management 2018-2030 to reduce the use of single-use plastics and to achieve 100% plastics recycling through a circular economy approach. **Extended Producer Responsibility (EPR)** is a key policy instrument to drive the adoption of a circular economy, particularly within the packaging industry. EPR is an environmental policy approach that assigns producers financial or physical responsibility for a product's entire lifecycle, including the treatment or disposal of post-consumer products. EPR policies are much more than funding mechanisms — they can bring many additional benefits, such as improving the system's efficiency and transparency, as well as incentivizing upstream solutions.

Currently, the Pollution Control Department is working with Mae Fah Luang University to undertake a law-drafting project on promoting a circular economy for

packaging waste management, with EPR integrated as a fundamental mechanism. The draft Act, along with its implementing regulations, will undergo an intensive stakeholder consultation process before submission to the Cabinet by 2024. Based on the timeline set in the Plastic Waste Management Action Plan Phase II (2023-2027), the draft Act should be enacted by 2026.

SecondMuse, a global impact innovation agency driving systems change in Asia's climate landscape, commissioned Environmental Research Institute, Chulalongkorn University (ERIC) to investigate the potential market-level impact and implications of a national-level rollout of EPR on the Thailand plastics value chain, market, and ecosystem. This includes changes in the market, opportunities, and policies around the circularity of rPET, as well as potential regulatory shifts around the use of rPET for food-grade packaging applications.

The research methodology used in this study covers desk research and intensive reviews of EPR policies and movements at the global and regional levels, in-depth interviews with key stakeholders in the plastic value chain, and reviewing material flow analysis of plastic waste, particularly PET. Dive into a summary of key findings from the study below.

1. <https://www.unep.org/interactives/beat-plastic-pollution/>

2. <https://www.worldbank.org/en/country/thailand/publication/market-study-for-thailand-plastics-circularity-opportunities-and-barriers>

CURRENT ESTIMATES

80% of
PLASTIC LEAKAGE
into marine environments
is from **Asia**

PROJECTION FOR 2040

23-37
MILLION TONS
of **plastic waste**
will enter aquatic
ecosystems per year



Section 02

KEY FINDINGS

Key Finding 1

A comprehensive policy framework is needed to address plastic pollution from both upstream and downstream perspectives

The plastic waste problem is a complex and multi-dimensional issue that cannot be fully addressed with a single policy instrument. OECD (2022) proposed **five policy strategies to tackle the issue**³:

Five PLASTICS POLICY APPROACHES



1



Restrain Demand

Examples of policy instruments

- Taxes on single use products
- Measures for resources efficient production
- Promote reuse
- Remove fossil fuel subsidies

2



Design for Circularity

Examples of policy instruments

- Recycled content standards
- EPR fee modulation for circular design
- Product norms and hazardous chemicals regulation
- R&D programs to reduce microplastics emissions

3



Close Leakage Pathways

Examples of policy instruments

- Ban or tax frequently littered items
- Collection of MSW
- Sanitary disposal infrastructure
- End-of-pipe solutions such as WWTP

4



Clean up

Examples of policy instruments

- Extending EPR to litter clean-up
- Recovery plastics in oceans
- Capture leaked plastics in rivers
- Litter clean-up campaigns

5



Enhance Recycling

Examples of policy instruments

- EPR for packaging and durables
- Landfill and incineration taxes
- Deposit-refund
- Pay-as-You-Throw

DEFINITIONS

EPR Extended Producer Responsibility

MSW Municipal Solid Waste

WWTP Waste Water Treatment Plan

On its own, the policy instruments above are less effective — each must be a part of a larger policy mix that includes a variety of instruments that are mutually supportive and complementary of one another.

The adoption of enabling and soft policies, such as research and development (R&D) investment, communication, nudging and education measures, voluntary approaches, and stakeholder alliances, are also required in addition to steering policy instruments (such as legally binding regulatory interventions, mandatory standards, and economic instruments). However, the right incentive structure for an environmentally-sound plastics economy must be provided by regulatory and economic instruments.

EPR is an effective instrument that has potential to improve the circularity of plastic waste in various phases of plastic production and consumption, and can **play an important role in:**

- 1 promoting design for circularity if an EPR fee modulation is set for this purpose
- 2 improving collection for recycling
- 3 supporting litter clean-up initiatives

Recycled content standards are considered as a policy instrument to help promote design for circularity and should be added in mandatory EPR schemes for packaging. In collection for recycling, it is a common objective of EPR to impose recycling targets or other obligations on producers to ensure the internalization of external costs and the creation of a stable financing framework for recycling.

Case Study

Policy in Action

EU Directive 2019/904

In recent years, EPR has also been leveraged as a tool to reduce the consumption of single-use plastics and frequently littered items.

This can be seen in the case of EU Directive 2019/904 which stipulates mandatory EPR schemes for selected items such as balloons, tobacco products with filters, and wet wipes, as a means of discouraging the use of these products and to finance waste management and disposal.

3. https://www.oecd-ilibrary.org/environment/global-plastics-outlook_de747aef-en



Key Finding 2


EPR is receiving more support globally, with examples of good practices and lessons learned for potential adoption in Thailand


A review of EPR laws and management systems in countries with effective EPR practices, including Germany, France, Belgium, South Korea, Japan, and South Africa, was conducted, with the EPR scheme in Belgium showing the best performance in terms of recycling rates, surpassing the EU's targets.


Belgium is a good example of a system having one Producer Responsibility Organization (PRO), supported by municipalities for collection. To date, the majority of other countries apply eco-modulation fees to incentivize eco-design for packaging. European countries have included recycled content targets for plastic packaging following the EU Directive 2019/904.


Recently developed EPR laws in South Africa include recycled content targets for some types of plastic packaging (PET, PE) and single-use plastics (straws, cups, cutlery). South Korea has imposed more stringent design rules by requiring mandatory recyclability labels on packaging and banning the use of PVC materials and colored PET bottles.

At the regional level, there are four countries in ASEAN that have EPR laws in place: Singapore, Vietnam, Indonesia, and the Philippines. However, none of them have adopted full implementation due to various timelines and differences in scope and enforcement:

 **The Philippines** only focuses on plastic packaging, while other countries cover all packaging materials.

 **Indonesia** expands the scope of producers to retailers and service sectors, but the laws rely on a voluntary approach without clear penalties and only prescribe individual responsibilities with long-term waste reduction targets.

 **Vietnam** has postponed implementation to 2024, with options for producers to form a PRO or pay the EPR fee to the Environmental Fund.

 **Singapore** has no implementing laws detailing the preparation of EPR schemes for packaging, but mandatory reporting requirements have been enforced since 2020.

As for Malaysia, under the Plastic Sustainability Roadmap 2021-2030, the government will initiate a Voluntary EPR Phase from 2023-2025 before tran-

sitioning to their planned mandatory EPR scheme in 2026. Nevertheless, Malaysia has made more progress than Thailand in terms of fundamental waste management regulations, with mandatory waste segregation at source being introduced for selected states in 2015, and enforced from June 1, 2016. In Thailand, the responsibility to impose such mandates lie with the local authorities through the implementation and enforcement of local ordinances.

Lessons Learned

Based on the review of experiences in other countries, some lessons learned that could be drawn for Thailand's adoption are as follows:

- **The definition of “packaging” should be clearly defined and cover all packaging types** and material types, so that the management of all post-consumer packaging is encompassed within the collection system. This will prevent unforeseen circumstances such as the use of other materials or packaging types to avoid paying EPR fees.
- **Roles and responsibilities of key stakeholders**, such as producers, retailers, online market platforms, local authorities, and PROs, **need to be clearly defined and established** to ensure effective and smooth implementation across all levels.
- Most producers establish a **Producer Responsibility Organization (PRO) to manage coordination with stakeholders** and to **set up the necessary collection system for post-consumption packaging** for recycling or other uses.
- **Set ambitious objectives, scope of activities, and goals within a clear timeframe** to enable stakeholders to support the implementation process and appropriately allocate budget for this purpose.
- **Establish eco-modulated EPR fees** and other measures to incentivize producers to produce packaging that is easy to recycle and reuse.
- **Establish monitoring and law enforcement mechanisms to prevent free riders** and provide reporting of information.

Key Finding 3

Recent unlocking of rPET regulations on food contact packaging will increase rPET demand in Thailand

The use of recycled plastics in food packaging has been banned by the Food and Drug Administration (FDA) until recently, where after a long push from the private sector, the FDA announced the ‘Ministerial Notification on Quality or Standard for Plastic Containers’ dated 1 June 2022, which now allows food-contact recycled plastics to be used as food containers. This law repealed the Notification of the Ministry of Public Health (No. 295) B.E. 2548 (2005).

Estimates indicate that the use of rPET for all applications will increase up to 250,000 tons per year, with 60% coming from the textile industry. From 2023 onward, the total production of food-grade rPET is expected to increase to up to 100,000 tons in the next few years⁴. However, major barriers to increasing demand are the high price, unsettled documentation, and stringent procedures under FDA regulations. Without mandatory recycled content standards, domestic demand for food-grade rPET is expected to be as low as 10%, but may gradually increase to 20,000 tons in 2025. The rest of the food-grade rPET volume will be exported to serve global demand.

4. Based on an interview with the Plastics Institute of Thailand.

IMPACT OF NEW rPET REGULATIONS

Increase of use of rPET up to

250,000 TONS PER YEAR



60% from the textile industry

Food-grade rPET production expected to increase to up to

100,000 TONS

in next few years

MAJOR BARRIERS TO INCREASING rPET DEMAND

- 1 High price
- 2 Unsettled documentation
- 3 Stringent procedures under FDA regulations



Key Finding 4

Mandatory recycled content and EPR would help increase PET collection and recycling further

According to the Plastic Waste Management Action Plan Phase 2, the government plans to impose mandatory recycled content targets of no less than 30% for specific plastic products and packaging along with the CE/EPR legislation on packaging waste to be enacted in 2027. To project the impact of policy changes on PET demand, material flow analysis (MFA) of PET has been used as a basis for scenario analysis. The material flow analysis is an analytical method to quantify flow and stock of materials or substances in a well-defined system.

Based on the latest plastic material flow study conducted by Kasetsart University in 2022 using 2021 data, PET resin is produced and used in Thailand at a rate of about 615,863 metric tons per year. PET waste from the consumption of PET products and bottles is generated at a rate of more than 500,000 metric tons per year, with a collection rate of 494,194 metric tons per year (87% of the total consumption). Overall, 37% of PET waste is managed by recycling, 18% is exported, 17% undergoes proper disposal, 15% is improperly disposed of, and 13% of total consumption leaks into the environment.

PET USAGE & WASTE IN THAILAND

PET resin produced and used

615,863 METRIC TONS PER YEAR

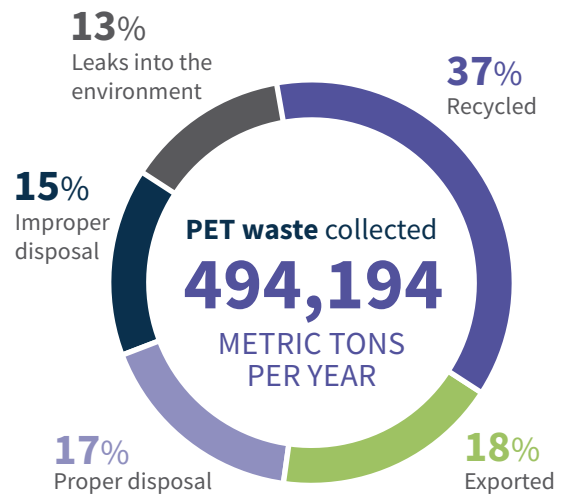
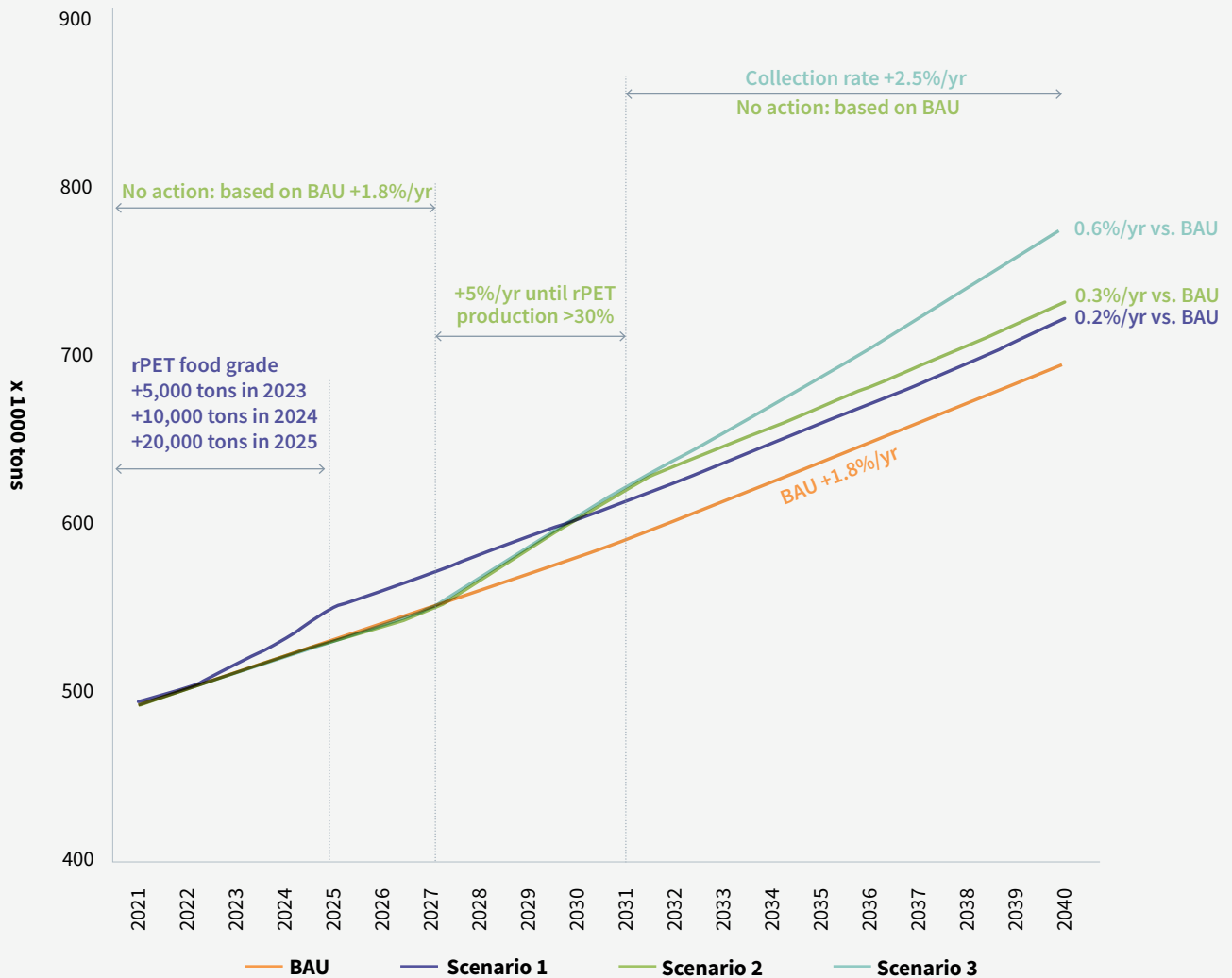


Figure Amount of PET waste collection in 2021-2040 based on Scenario Analysis



The MFA of PET in 2021 was used as a basis for scenario analysis in this study. The business-as-usual (BAU) scenario was projected by assuming production and consumption will increase at the same rate as the average municipal solid waste (MSW) growth rate of 1.8%, while collection and recycling rates remain constant. Scenario 1 is based on the de-regulation of food-grade rPET, where PET collection is projected to increase by an average of 2.4% per year from 2021 (or 0.2% per year compared with BAU) while the recycling rate will increase by 2.8% from the 2021 base year. Scenario 2 is based on the introduction of mandatory recycled content requirements of 30% in 2027, where collection and recycling rates of PET will increase by 2.6% and 3.1% per year after 2027. Finally, Scenario 3

portrays the case where CE/EPR law is in effect, to which collection and recycling rates are projected to increase by 3.0% and 3.6% per year, respectively.

From a cost perspective, life cycle costing analysis of recycled plastic resins showed that rPET has the highest production costs, especially in terms of purchasing, land, and labor costs. These cost items are relatively higher for plastic recyclers that are certified with international standards on environmental management and quality control. Without government interventions such as enforcement on recycled content requirements and EPR legislation, it would be challenging to expand the high-quality rPET market in Thailand.

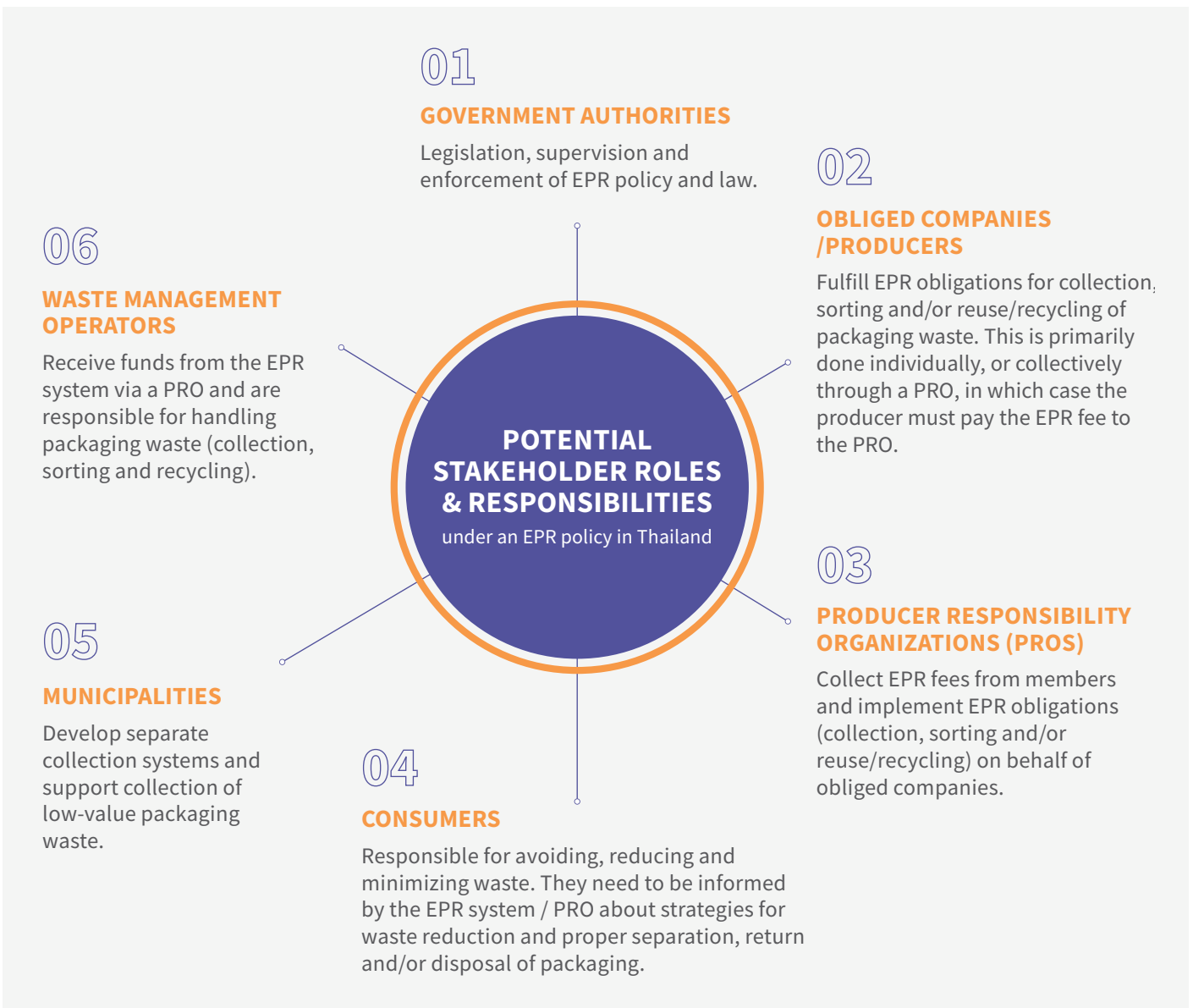
Key Finding 5

Perspectives from stakeholders on the EPR law for packaging

The research team conducted stakeholder interviews on plastic recycling, rPET regulations, and EPR law for packaging waste from October-December 2022. The report presents interview results from 15 stakeholder representatives, covering the public and private sectors.

This includes field surveys to the Mirror Foundation to learn more about the Re-life Recycle Project, and site visits to two plastic recyclers in the Rayong province. In addition, five startups and SMEs engaging in plastic collection and recycling businesses were also interviewed to gain their perspective on EPR implementation.

In general, all respondents agreed that **Thailand should have an EPR law for packaging waste management** which can help circulate materials back into the economy, reduce CO2 from virgin material production, reduce the risk of marine plastic pollution and increase green jobs in the waste management sector. However, some respondents indicated concern about the incurred costs that might be passed on to consumers.



According to the interview findings from previous studies and this study,

opinions on EPR system design issues for Thailand from various stakeholders can be summarized as follows:

- 1 There should be a *mandatory EPR policy* in Thailand along with other supporting policies, e.g. packaging labeling, consumer education, ban on non-recyclable or hard-to-recycle material (e.g. colored PET), and recycling-friendly materials.
- 2 Thailand should have a *law on packaging waste management* based on EPR principles to cover all types of materials and all types of packaging (i.e. primary, secondary, tertiary, and service packaging).
- 3 An appropriate EPR model is one that allows the *private sector to self-manage* through the establishment of a Producer Representative Organization (PRO), but also allows potential producers to develop their own collection and recycling systems within the boundaries of rules and targets set by the state.
- 4 The EPR system must *facilitate collaboration with local waste scavengers, Salengs, and junk shops* by registering with the local administration and reporting the amount of packaging collected through a digital platform. The PRO should also *support community-based collection centers* equipped with a baler to reduce storage and logistic costs.
- 5 The CE/EPR law should *stipulate the duties of the local administrative organizations* to set up segregated waste collection systems and support the establishment of material recovery facilities (MRFs).
- 6 Large distributors and stand-alone convenience stores with parking spaces should have a duty to *set up drop-off points for packaging waste*.
- 7 The *targeted amount of collection for recycling* should be above the current collection rate based on packaging types. Collection targets and strategies should cover areas that have a high risk of plastic leakage to the environment and unique collection challenges, such as islands, and should also give emphasis on low-value and hard-to-recycle packaging.
- 8 The CE/EPR law should *define a targeted proportion of recycled materials used for plastic packaging*. Most respondents agreed with a minimum of 10% and a gradual increase over time. Producers should also be incentivized by eco-modulation fees or fee reductions for packaging that have higher recycled content.
- 9 *Incentives and measures for environmentally-friendly packaging* designs should be implemented with different fee rates and other promotional measures.
- 10 The CE/EPR law should support and/or account for the establishment of a *deposit-refund system* for certain types of packaging in the future.
- 11 The CE/EPR law should require recycling factories that acquire packaging waste from the EPR system to meet certain *environmental management standards*, e.g. ISO14001.
- 12 PROs should ensure that the collected waste is *recycled only in environmentally sound facilities* and allocate EPR subsidies to recyclers, rather than waste collectors under the audit system.

Section 03

RECOMMENDATIONS

Although plastic waste recycling in Thailand is quite well-established, the lack of source segregation and separation systems can lead to low collection rates. Packaging collection, sorting, and recycling incur expenses that outweigh the income from the sale of recycled materials. Under the business-as-usual situation where plastic waste collection and recycling is driven by the market, non-funded recycling is only made possible because of the services and support provided by low-wage informal waste collectors, which typically only involves high-value packaging types⁵. EPR can effectively provide the required funding and aid to increase the rates of collection, sorting, and recycling if properly designed.

The success of an EPR system relies on a number of key enabling conditions, particularly the institutional set-up, resource mobilization, baseline development, and communication and coordination. Since EPR systems are very new to Thai society, it is necessary for the government and key stakeholders to have a preparedness program prior to the law's enactment. Key actors in the packaging value chain should be educated and prepared for EPR compliance and implementation, covering packaging producers, brand owners, potential PROs, waste collectors including local governments, and recyclers.

Based on the results from the review of existing EPR implementation and stakeholder interviews, a set of key recommendations is proposed for the government and relevant stakeholders to prepare for the EPR system and to address the issue of plastic pollution effectively in Thailand.

1

More emphasis on upstream solutions in draft packaging waste management laws

This study recommends that the government consider adding more upstream measures that can help restrain demand for virgin plastics and accelerate design for circularity. Examples of policy instruments are taxes on single-use products, promoting reuse business models, recycled content standards and EPR fee modulation for circular design. Producers that improve their packaging material and design to facilitate reusability, recyclability and ease of sorting among consumers and waste sorters should be incentivised, and R&D programs by researchers and SMEs that focus on reducing microplastics emissions should be better supported and promoted.

2

Pilot projects on deposit-refund systems in some areas

The deposit-refund system (DRS) is an effective policy instrument to improve the circular economy for post-consumer packaging. Governments around the world are introducing new programmes or amending existing legislation to improve participation and increase redemption rates. By 2026, more than 70 jurisdictions worldwide will have a DRS for single-use drinks containers, with Singapore implementing a DRS in 2023 as part of its EPR approach to tackling packaging waste. The government should support pilot deposit-refund schemes in some islands in collaboration with brand owners, local retailers, and waste collection centers or junk shops to evaluate the effectiveness and cost structure of the DRS.

5. <https://ellenmacarthurfoundation.org/extended-producer-responsibility/overview>

3

More investment on collection infrastructure

There is an urgent need for the government and future PROs to invest in waste collection infrastructure, such as drop off points and sorting hubs in addition to improving capacities of waste collectors and junk shops to facilitate better plastic packaging collection rates from consumers. More community-based collection points should be established, where small shophouses can be utilised as collection points in urban areas (as seen in Hong Kong) by being equipped with a baler to reduce storage space needs and subsequently logistics cost from reduced transfers to recyclers and processors. Such business models should not be restricted by the Town Planning Law and should be promoted to help create convenience for consumers to gain access to more drop-off points for return of recyclables.

In parallel with the development and refinement of EPR laws, the government and private sector should extend support to beach and waterway clean-up and litter removal campaigns to address immediate plastic leakage concerns. Incentives can be given to organizations, e.g. TerraCycle Thai Foundation and Trash Hero Thailand Chapters, to further collaborate with local governments and communities to develop segregation and waste collection infrastructure on land to reduce littering and fly-tipping behavior.

4

Enhancing the capacity and welfare of waste collectors

Waste collectors make significant contributions to the reduction of plastic waste leakages and play a key role in waste recycling; however, informal waste workers are kept vulnerable due to a lack of access to market information, exposure to occupational health hazards, societal discrimination, and lack of social security protections. This study recommends that the government provide support mechanisms and incentives to companies or non-profit organizations that adopt inclusive models of collaboration with informal waste workers, as well as providing training for local junk shops to access digital marketplaces to improve price transparency, traceability and access for buyers. Such efforts can be seen through the work of the Surat Thani municipality, where *Salengs* are provided with vests and identification numbers

to establish trustworthiness to customers, similar to motorcycle taxi riders. To encourage registration among *Salengs*, the government can offer additional support in the form of materials such as gloves, face masks, and access to social welfare such as annual health check-ups, living expense support, and training in occupational, health and safety. In an EPR system, the PRO could cooperate with local governments in registering and supporting *Salengs*.

5

Enhancing the capacity of recyclers

Thailand has a formal recycling infrastructure for PET, HDPE, and other rigid plastics, but there are few recyclers for LL/LDPE films. To encourage waste collectors and junk shops to collect LL/LDPE, the government should introduce recycled content requirements and offer tax incentives to increase collection rates. R&D grants should be allocated for companies towards the development of recycling or upcycling technologies for hard-to-recycle plastics and to enhance innovative solutions for microplastic prevention within recycling processes. In addition, additional support such as investment incentives offered by the Board of Investment (BOI), soft loans and market promotion should be made accessible to support the upcycling product market.

6

Enhancing consumer awareness

Consumers are very important to the success of an EPR system. It is imperative to increase education and awareness on plastic waste and the 3R (Reduce, Reuse, Recycle) concept to ensure that consumers are equipped with the necessary information to practice waste separation and recycling effectively. The Chula Zero Waste initiative is an example of a university effort to promote waste reduction at source, and the promotion of zero-waste schools and communities by the government (Department of Environmental Quality Promotion under MONRE) should be continued. Incentives, whether monetary or non-monetary benefits, can be provided to encourage cooperation and support for changes. For example, the government can offer income tax incentives for consumers that purchase products with the circular mark certification⁶, besides offering corporate income tax reduction for companies using biodegradable plastic products.

6. Circular mark certification is a new eco-labeling and certification scheme developed by partner agencies from the public and private sector. VGREEN of Kasetsart University developed and piloted a certification system with 30 companies. Thailand Environment Institute (TEI) is developing a national certification system. More details can be found here: <https://pmuc.or.th/?p=7136&lang=en>

ABOUT

SECONDMUSE

SecondMuse is a global impact and innovation firm specializing in bringing communities together to build economies that benefit people and heal the planet. We utilize a community-driven approach to shape and reimagine the relationships between people, communities, and the planet by deeply understanding our systems. We then use our learnings to design and implement solutions that lead to transformational change. Our approach includes three phases: Discover, Design, and Implement which are reiterated to pilot, refine, and scale solutions that bring transformation.

To find out more about how SecondMuse is making an impact, visit www.secondmuse.com



In response to an increasing necessity for environmental research in planning national development as well as providing expanded graduate-level courses, the **Environmental Research Institute, Chulalongkorn University (ERIC)** was established on 5 October 1974. Since then, it has grown to become a significant academic institute committed to understanding the relationship between mankind and the environment. The main role of ERIC is to conduct environmental research to provide information for planning on problem mitigation and prevention as well as conservation and development for a better environment and quality of life for Thai society.

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