Feasibility study on implementing the economic and fiscal measures for the prevention and reduction of plastic packaging waste in Thailand

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Feasibility study on implementing the economic and fiscal measures for the prevention and reduction of plastic packaging waste in Thailand

Prepared for the Collaborative Action for Single-Use Plastic Prevention in Southeast Asia (CAP SEA) Project

Implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Contents

List of Abbreviations

BCG	Bio, circular, and green economy
COP26	The 26th Convention of the Parties on Climate Change
EPR	Extended Producer Responsibility
EU	European Union
GDP	Gross National Product
GHG	Greenhouse Gases
HDPE	High-density polyethylene
Kt	Kilotons (a thousand tons)
LDPE	Low-density polyethylene
LLDPE	Linear Low-Density
MRF	Material Recovery Facility
NGO	Non-governmental Organization
PET	Polyethylene terephthalate
PP	Polypropylene
PPE	Personal Protective Equipment
PRO	Producer Responsibility Organization
rPET	recycled polyethylene terephthalate
SDGs	Sustainable Development Goals
SUP	Single-Use Plastics
VAT	Value Added Tax
YOY	Year-on-year

Executive Summary

The widespread use of single-use plastics and their improper management have created pollution on water and land across the world. In Thailand, plastic waste accounts for 12 percent of the total waste across the country and nearly 30 percent of total municipal waste generated each year. Every year, Thailand generates approximately two million tons of plastic waste (most of them are single-use packaging), but only 0.5 million tons were recycled. The packaging sector is the largest contributor to plastic waste. Single-use bags and bottles account for 60 percent of total plastic packaging waste. Mismanaged and untreated plastic waste end up in landfills, and oceans, and is left to be burned in an open causing a myriad of environmental and health hazards as well as climate change impact.

Since the Covid-19 pandemic began in 2020, the consumption of single-use plastic packaging has risen sharply due mainly to increasing demand for food delivery services, online shopping, and medical supplies. The trend continued to grow even today when no lockdown measures are in effect. Unless more efforts are jointly put in by the public and private sectors to deaccelerate this hike in demand and promote the circular economy principle—reduce, reuse, and recycle—the problem will be worsened and cost a lot more to resolve.

Recognizing this as a priority problem in the country, the government has elevated the plastic waste problem to be a national agenda. It has convened and collected viewpoints from concerned stakeholders including relevant government agencies, private sector partners, and scholars leading to a launch of the first Plastic Waste Management Roadmap (2018-2030) in 2018. The roadmap lays out ambitious phase-wise targets to remove targeted single-use plastics from the Thai market by 2027. Subsequently, the first Action Plan for Plastic Waste Management Phase I (2020-2022) came out in 2020. Concurrently, a public and private sectors partnership, including plastic producers, brand owners, retailers, and international partners, has also been formed to drive the implementation of the roadmap. Since its inception, several initiatives have been launched and are being implemented to drive a societal shift towards a circular economy.

However, addressing the plastic waste problem from existing legal and policy frameworks is not easy as there are many, often overlapping, legislations involved, and plastic waste is recognized and treated as one of the many types of common waste. As such, the local governments are mandated to take care of the problem while their budget and technical capacity constraints have further exacerbated the problem.

Moreover, Thailand's solid waste management focuses mainly on the collection, transport, and disposal processes, and to a lesser extent 'recycling', but not on the prevention and reduction processes—the most important steps of a circular waste management model. Waste segregation at source is not promoted and the collection/disposal fees are set way too low against the actual costs of waste management processes. Even with the newly introduced fee structure, there remains a wide margin between the actual costs of waste management and collected revenues.

This study examines the economic and fiscal instruments used worldwide by different countries to incentivize a shift toward sustainable packaging waste management and recommends viable incentives for the prevention and reduction of single-use packaging in Thailand by which, together with targeted policy changes, eco-packaging design, and technological solutions, circular plastic packaging solutions could be achieved in the country. The study is divided into five sections.

Section 1 provides the contextual background on Thailand's packaging landscape with a deeper focus on plastic packaging which commands the highest rate of single-use packaging in the country.

Section 2 investigates select economic and fiscal measures used by many countries in Europe, Asia, and North America to address the single-use plastics problem. Experiences from these countries are

investigated and lessons are drawn from the implementation of the measures. These measures are then prioritized using a set of shortlisting criteria. As a result, 11 measures are selected for further analyses.

Section 3 further looks into each of the 11 measures to examine how feasible they can be implemented with success in Thailand. A series of bilateral interviews were conducted with relevant stakeholders (e.g., government, industry experts, academics, international development partners), and focused group meetings were held with the producers, retailers, and social enterprises whereby their views and insights were used to inform a deeper analysis of each measure. The Strengths, Weaknesses, Opportunities, and Threats (SWOT) analyses are conducted for the prioritized measure against the Thai context.

Following the results of the SWOT analyses, **Section 4** recommends six measures for further implementation in Thailand. These measures include:

a. Single-use plastic packaging levies,
b. Tax incentives for the use of reusable plastic packaging and packaging with recycled content,
c. Tax incentives for recycling investment,
d. Deposit-refund scheme,
e. Extended Producer Responsibility, and
f. Green public procurement

Most of these measures are framed under the current legal framework with or without additional regulations under existing law. An exception may be needed for EPR where an EPR law is expected to lay out the ground rules and help smoothen the implementation while a voluntary EPR pilot is starting in a coastal tourist province of Chonburi. Further, these measures are recommended to advance and scale the success of past and present initiatives, such as the single-use plastic packaging levies which are now being implemented in major retail/convenience stores, supermarkets, shopping malls, and coffee shops; tax incentives for recycling investment under the current Board of Investment's support packages; and green public procurement which has been introduced since 2008.

Section 5 presents key steps for implementing these measures. It is important to note that the successful roll-out and implementation of these measures are subject to several factors: (a) strong political leadership from an initiating agency; (b) high-level political support, close collaboration across ministries (i.e., finance, environment, interior, industry, prime minister's office), and (c) active engagement with the private sector (i.e., producers, brand owners, retailers, recycling actors) and civil society. It is also advised that close consultations with concerned stakeholders, be it a workshop, survey, or public hearing must be conducted before the rollout to inform the refinement of the measures and prevent outright objections. Clear and consistent communication with the public will ensure better compliance and success of the measures. For a new law to be enacted, legal opinions from the Council of State (the government's legal advisor) are needed, therefore, their close engagement in the formulation process will be key. Last but not least, local governments have a crucial role to play to promote the circular economy mindset by taking these measures into action and introducing a revised waste collection fee. However, a clear mandate from the central government, technical capacity, and budget are needed for them to play such a role.

Findings from this study are expected to complement other efforts being driven by the Collaborative Action for Single-Use Plastic Prevention in Southeast Asia (CAP SEA), in particular on plastic waste regulatory options and design for recycling, and ultimately contributing to the project objective of supporting the vision of the Bio-Circular-Green Economy Model (BCG Model) and the Circular Economy through the upstream measures (i.e., prevention, reuse, and design approaches for supporting better recycling).

SECTION 1

INTRODUCTION

1.0 Introduction

The widespread use of single-use plastics (SUP) and their improper management have created pollution on water and land across the world. In Thailand, plastic waste accounts for 12 percent of the total waste across the country and nearly 30 percent of total municipal waste generated each year. Every year, Thailand generates approximately two million tons of plastic waste (most of them are single-use plastics), but only 0.5 million tons were recycled[1]. This waste is dominated primarily by two products: plastic bags and bottles, which together account for 60 percent of total plastic packaging waste[2]. Statistics show an average Thai used eight plastic bags per day, which equates to around 198 billion bags per year. Thailand's per capita consumption of plastic is among the highest in Asia[3].

While the mass of plastic bag waste is almost double that of plastic bottle waste, few bags are collected for recycling as they are lightweight and often too contaminated for recycling. Much of this plastic ends up in the environment, notably landfills and/or marine ecosystems. Approximately 65 percent of waste collected from Thai natural environments in 2018 was some form of plastic packaging[4].

At the 26th Convention of Parties on Climate Change (COP26) in Glasgow, Scotland in November 2021, Thailand has committed to reaching carbon neutrality by 2050 and greenhouse gas neutrality by 2065. The country has also increased its current GHG emissions reduction target to 40% with conditions[5]. At the national level, Thailand has set itself to achieve the Sustainable Development Goals by 2030 and has aligned the Sufficiency Economy Philosophy[6], the circular economy, and the Bio, Circular, Green (BCG) national strategy to steer towards the achievement of the Goals. Sustainable management of plastic packaging waste offers a direct contribution to the circular economy and the BCG strategy and is explicitly targeted as a national priority issue under those frameworks. In addition, Thailand has launched the Plastic Waste Management Roadmap (2018-2027) and set the targets to phase out different types of plastics in two phases—2018-2022 and 2023-2027—with the ultimate goal of 100% target plastics recycled by the end of the roadmap.

To make that work, conducive policy and regulatory framework must be in place, alternative solutions and technology must be devised, and viable economic and/or fiscal instruments need to be implemented to enable a shift from the conventional consumption pattern of single-use plastic packaging to sustainable ones where resources will be maximized, waste will be minimized, and the greenhouse gas emissions will be mitigated.

The **Collaborative Action for Single-Use Plastic Prevention in Southeast Asia (CAP SEA)** project, funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, is the regional module of a global project implemented in Thailand, Malaysia, and Indonesia. Its objective is to reduce single-use plastic (SUP) by introducing upstream circular economy policies, innovative business models, and capacity development.

[1] PCD, 2018
[2] WWF Thailand, 2020
[3] ibid
[4] ibid
[5] With technology transfer and financial support from other countries.
[6] Introduced by the late King Bhumibol Adulyadej (Rama IX) in 1998 and has been enshrined into the 20-year national strategy in 2018.

In Thailand, CAP SEA contributes to the Thai Government's priority of the Bio, Circular, and Green (BCG) economy model implementation for sustainable development, the Plastic Waste Management Roadmap (2018-2027), and the circular economy.

This study seeks to examine and recommend viable economic and fiscal incentives for packaging prevention and reduction of packaging waste in Thailand of which the implementation, together with other policy change, eco-packaging design, and technological solutions, is expected to drive towards more circular management of plastic packaging waste in Thailand

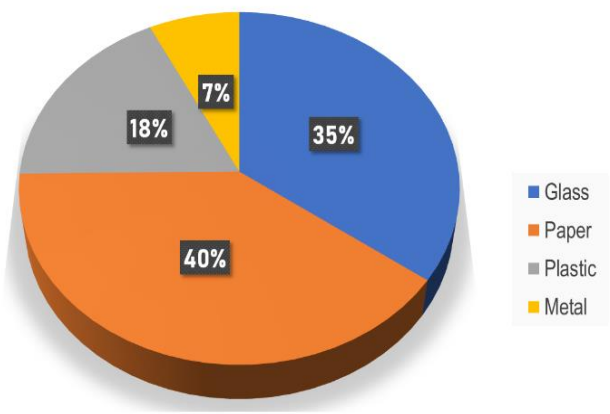
The study investigates select economic and fiscal measures used by many countries in Europe, Asia, and North America to address this problem. A SWOT[7] analysis was undertaken for each measure before deriving at six measures recommended and social marketing campaigns, are expected to lead to the reduced consumption of single-use plastic packaging, higher demand for reusable packaging, and increased recycling and demand for recycled products in Thailand.

1.1 Thailand's packaging landscape

Thailand is the leader in Southeast Asia's packaging industry for all types of materials—paper, plastics, glass, and metal. The country's robust ecosystem of upstream players, technological capacity, strong domestic consumption, and export demand made the Thai packaging industry one of the largest sectors which connect with various related industries in the whole supply chain.

In 2020, Thailand produced 2.2 million tons of paper, 1.37 million tons of plastic, 1.56 million tons of glass, and 0.43 million tons of metal for packaging while it sold 2.19 million tons of paper, 0.97 million tons of plastic, 1.9 million tons of glass, and 0.40 million tons of metals respectively[8]. Covid-19 had a slight effect initially on the demand for paper and glass during the first wave of the pandemic (March-May 2020) but rebounded thereafter. Demand for plastic packaging, however, continued to grow due mainly to surging demands in the food, beverage, and health sectors[9].

Figure 1. Market share of packaging materials in Thailand by type and tons



Source: Packaging Industrial Intelligence Unit, 2021

Paper has the biggest share in the Thai packaging market, followed by glass, plastics, and metal. While not the most produced (by tons), plastics are used in far more applications than any other types of materials, from food & beverages to household products, medical supplies, lifestyles, automobiles, and many more. The decades-long tax privileges package for the petrochemical industry has contributed to the robust growth of the plastic industry in the country thereby making it cheap to make and used in various sectors.

Unlike other materials with a less complicated recycling process, post-consumption plastic products require several steps before they can be turned into the same or other new products. Smaller pieces of

[7] SWOT analysis is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning.
[8] Office of Industrial Economics, 2020
[9] Packaging Industrial Intelligent Unit, 2021

plastics and contaminated ones (e.g., fresh food packaging) are also harder to sort or clean before they would be trashed, let alone recycling.

Table 1. Production and distribution volume of different types of packaging in Thailand

Material	Volume (million tons)	2016	2017	2018	2019	2020
Plastic	Production	1.477	1.470	1.420	1.317	1.370
	YOY (%)	-14.37	-0.45	-3.44	-7.22	4.03
	Distribution	1.067	1.063	1.023	0.953	0.973
	YOY (%)	-16.05	-0.32	-3.75	-6.92	2.10
Paper	Production	2.130	2.156	2.200	2.252	2.207
	YOY (%)	1.01	1.25	2.04	2.35	-1.99
	Distribution	2.127	2.153	2.200	2.234	2.192
	YOY (%)	0.74	1.19	2.20	1.53	-1.89
Glass	Production	1.891	1.995	1.718	1.526	1.566
	YOY (%)	129.66	5.50	-13.89	-11.18	2.65
	Distribution	2.240	2.530	2.161	1.878	1.932
	YOY (%)	170.04	12.95	-14.60	-13.08	2.89
Metals	Production	0.423	0.442	0.467	0.404	0.437
	YOY (%)	-3.43	4.43	5.62	-13.58	8.28
	Distribution	0.447	0.459	0.462	0.395	0.402
	YOY (%)	19.55	2.83	0.45	-14.38	1.75

Source: Packaging Industrial Intelligence Unit, 2021

While the reduction of overall packaging waste is the desirable goal to achieve a circular economy, addressing plastic packaging waste provides a strategic advantage as it is the material with the highest mismanagement rate causing both national and global problems. This study, therefore, focuses on selecting measures that are expected to address the ubiquitous consumption of single-used plastic packaging in Thailand which is now causing detrimental effects to human lives and nature and leading to the rising greenhouse gas emissions.

In line with the CAP SEA project's goal, this study strives to identify and recommend measures that will prevent regrettable substitutions of single-use materials (i.e., replacing plastic packaging with other single-use materials) and promote reusable solutions for better resource efficiency.

1.2 Thailand's plastic production and plastic waste situation

Thailand is a producer and exporter of plastics. Plastics play an important role in the Thai economy. Since the 1950s the use of plastic products has expanded twenty-fold owing to their low cost, various functional properties, durability, and wide range of applications. In 2020, global plastics production reached 367 million tons[10]. Thailand's petrochemical sector is the largest in the Southeast Asian region and the 16th largest in the world. In 2018, Thailand produced 11.8 million tons of downstream petrochemical products, including plastic resins. Thailand's plastics industry contributed 1,100 billion baht (USD 36.9 billion) to the national economy in 2018, representing 6.71% of Thailand's GDP.[11]

In terms of waste, plastic waste generation has increased steadily since 2009. In 2018, plastic waste accounted for 12 percent of the country's total solid waste, of which 1.2 million tons are single-use plastic bags and the rest are other plastic packaging (e.g., food trays, boxes, bottles, closures). Only about 25 percent of plastic waste has been recycled while the rest are primarily single-use plastic

[10] Statista

[11] World Bank Group, 2021in

packaging.[12] Total recycling capacity in the country is 500 kt, and 442 kt are used to recycle domestic plastic waste, most of the 556kt of plastic waste imported into Thailand in 2018 ended up in landfills or dumpsites. The packaging sector contributes to almost 60% of the total plastic leakage to the oceans with 166 kt of packaging waste leaking into oceans and waterways.[13]

Statistics in 2018[14] showed there was more plastic waste imported (556 kt) than what the country could recycle (500 kt). Around 41% of the collected plastic waste was improperly managed. About 30% of the plastic waste in the country was uncollected, and about 336,000 tons of plastic leaked to the ocean every year—an equivalence of 4.8 kg/person a year.

1.3 Single-Use plastic packaging consumption during Covid-19 pandemic

As previously mentioned, plastic packaging was not affected by the Covid-19 pandemic but, on contrary, has seen a steady rise due to higher demand for plastic packaging, especially single-use food containers and packing bubbles, thanks to the sharp rise in food delivery, online shopping, and medical supplies. SUP consumption shifted from restaurants, hotels, coffee shops, which were ordered closed during the lockdown periods, to households that have lower levels of segregation, making collection and trading of materials significantly more challenging for recyclables collectors, street material pickers, and waste shops. The food delivery sector grew an estimated 33% in just one month and some businesses reported monthly growth numbers of as much as 300% during the first wave of Covid-19 (March-May 2020)[15]. Plastic waste generation in the country rose 15% from 2019 to be at 6,300 tons per day during the same period[16]

Even though these numbers may suggest more feedstocks would be available, it has been widely reported that contaminated items, from takeaway bags to containers, bottles, and cups, made up more than 80% of the plastic waste. Feedstock supply quantities dropped 20-50% during the lockdown period, and while there are some improvements now, supply volumes are still well below pre-COVID-19 levels[17].

A survey by the Plastic Club of the Federation of Thai Industries, shows Thai consumers are reported to show significantly increased awareness of living healthily and concern about the environment since the first wave of Covid-19 struck in April 2020. This gives insights for packaging designers and product producers to focus on building trust with consumers on food safety and hygiene, albeit perpetuating the continued consumption of single-use packaging.[18] However, the same survey also revealed some promising signs as packaging waste segregation, recycling, eco-friendly packaging, 100% recyclable packaging by 2025, recycled polyethylene terephthalate (rPET), and promotion of the recycling facilities are among the top list of things consumers would like to see after the pandemic has subsided.

As plastic waste pollution and its impacts become more of the concern nationally and globally, the Royal Thai Government has mainstreamed its efforts to combat the problem and elevated plastic waste pollution to be a national agenda. In 2018, a Sub-Committee on Plastic Waste Management, chaired by the Minister of Natural Resources and Environment, was established under the National Environmental. The government announced and started the implementation of the first National

[12] Public Relations Department, 2020 (based on the statistics from the Pollution Control Department)
[13] IUCN, 2020
[14] ibid
[15] World Bank Group, 2021
[16] PCD, 2021
[17] World Bank, 2021
[18] Packaging Industrial Intelligence Unit, 2021

Roadmap on Plastic Waste Management (2018-2030) in the same year, and in 2020 the 1st of the Action Plan Plastic Waste Management Phase I (2020-2022) was implemented. The roadmap aims to

i) ban 7 types of single-use plastics (Oxo-degradable plastic, cap seal, microbead, thin bags with less than 36 microns of thickness, straw, cup, Styrofoam food container) by 2022, and

ii) bring 100% of target plastics (HDPE/LLDPE/LDPE/PP bag, HDPE/LL/LDPE mono-film package, bottle, cap, cup, food tray/box, utensil) to recycle by 2027.

Figure 2. Minister of natural resources and environment Varawut Silpa-archa gives out free cloth bags to people to create public awareness on the single-use plastic bags ban in retail stores, supermarkets, and shopping malls.

SECTION 2

Economic and Fiscal Measures for Plastic Packaging Waste Management

2.0 Landscape of the economic and fiscal measures

Moving towards a circular economy requires multi-dimensional approaches from policy interventions and legal framework reform to technological advancement, design innovations, and market forces reorientation. Economic or fiscal incentives are used globally to encourage less waste generation and penalize more wasteful behaviors at the upstream, midstream, and downstream levels. Economic measures provide basic economic and regulatory guidance to influence the demand and supply for specific packaging materials and/or product groups. The 'carrot' and 'stick' approaches will be practical and should be introduced to address this problem.

Economic measures may be set up as a penalty (e.g., taxes, fees, charges) to deter wasteful behaviors or as a reward (e.g., credits, subsidies, tax exemptions) to encourage sustainable practices or both. These measures can be applied to upstream players, such as producers, mid-stream actors (e.g., retailers), or downstream stakeholders such as consumers.

In this section, a long list of structured economic and fiscal measures used to address the plastic packaging waste problem in different countries is presented. Their advantages, challenges, and enabling factors are discussed to inform the prioritization of these measures. Measures in the Blue texts are those already being implemented in Thailand (Table 2).

Due to the fact the European Commission has over the recent years issued several policy directives and guidelines to address the plastic waste issue in the European Union member states, many measures presented in this paper were drawn from the EU countries' experiences, with exception to a few which were also drawn from in other countries in North America and Asia.

In practice, no single measure should be implemented independently but rather implemented concurrently to create the desired impacts. Enabling policy and legal framework must be put in place and public awareness campaigns must be carried out to ensure their effectiveness.

Legal and Policy Context in Thailand

To understand which economic and fiscal measures might be appropriate to Thailand if implemented, one needs to have a comprehensive understanding of relevant legal and policy frameworks in the country which will shed some light on the underlying conditions and gaps. This is particularly important as some measures require a new law whereas others may not or require a minor change of existing regulations.

Fragmented laws are used to deal with the problem

Thailand does not have a specific law that addresses plastic waste as a problem. Plastic pollution is fragmented in several pieces of legislation under both centralized and decentralized government institutions. [19] Thai environmental law fails to recognize plastic as a threat or as pollution. Plastics are treated as part of general waste, garbage and litter; and therefore, are covered under two primary legislations—the **Public Health Act B.E.2535 (A.D.1992) and the Maintenance of the Cleanliness and Orderliness of the Country Act B.E.2535 (A.D.1992)**.[20] These two legislations are implemented by the local governments which are responsible for collecting, transporting, and disposing of municipal waste (including plastic waste). In terms of policy framework, Thai policies relating to plastic pollution can be addressed from both environmental and energy perspectives. Some larger local governments invest in the facilities to generate energy or fuel briquettes while most are constrained by their budget and technical capacity to do their jobs properly. However, the lack of proper waste, garbage, litter separation, and reception and treatment facilities continue to pose problems for the production of energy from municipal solid waste.

Marine plastic debris problems fall under the responsibility of the Department of Marine and Coastal Resources (DMCR), within the Ministry of Natural Resources and Environment, which exercises its authority provided by the **Promotion of Marine and Coastal Resources Management Act**. In so doing, the DMCR director-general can order actions taken to halt any activities that are deemed to cause significant harm to the marine and coastal environment, it may take preventive actions. It has exercised such authority in several instances.

As for plastic production, there is no ban on the production of plastic items. However, there are industrial product standards applicable to certain plastic products in accordance with the **Industrial Product Standards Act**. This Act provides both compulsory and voluntary industrial product standards to ensure trust and quality of products sold to the public. There is only one compulsory industrial standard relating to plastic products, the industrial product standard concerning plastics containers for sterile pharmaceutical products. However, there are various voluntary industrial standards for plastic products that are not legally binding, but with which producers may comply in order to enhance public trust over their plastic products, such as standards concerning plastic baby feeding bottles, plastic bags for food, and U-shaped plastic shopping bags.[21]

The initial substances for plastic production such as ethylene or propylene are classified as hazardous

substances under the **Hazardous Substances Act**. Production, import, transit, export, and possession of these substances are subject to authorization by the Department of Industrial Works, Ministry of Industry. For the domestic transport of plastic products and waste, there is no special legislation. The general law concerning the carriage of goods under the Thai Civil and Commercial Code applies in this instance.[22]

[19] IUCN, 2021

[20] Both laws are implemented by the local administrations with detailed prescriptions provided in subsidiary ministerial regulations.

[21] IUCN, 2021

[22] ibid

At the retails, there is no law on the sale or distribution of plastic products. No ban on the sale or use of plastic items has been issued. Reducing the use of plastic items is voluntary through government campaigns and privately-run initiatives. Some initiatives are gaining traction but need to be scaled up across the country.

Thailand's solid waste management hierarchy

It must be noted Thailand's waste management focuses mainly on disposal and energy recovery (with an increasing emphasis on recycling) but much less on prevention and reuse (Figure 3). The National Master Plan on Waste Management (2016-2021) sets out an ambitious target to achieve a sound and proper treatment for at least 75 percent of the municipal solid wastes produced by 2021.

Several measures are spelled out to deal with plastics. These include garbage separation, reduction or ban of single-use plastic bags and containers in governmental departments, educational institutions, tourist attractions, and the deposit system for plastic bottles and containers. Local administrations are required to assess and develop their waste management capacity as well as invest in waste reception, collection, and treatment facilities and develop a system for waste separation at source. The plan also requires the recycling of plastic waste and its conversion into alternative energy to be supported and encouraged. Other measures shall also be encouraged, including studies and research on the life cycle of products, especially plastics. However, this plan expired last year without an evaluation published or a definitive indication of the succession plan.

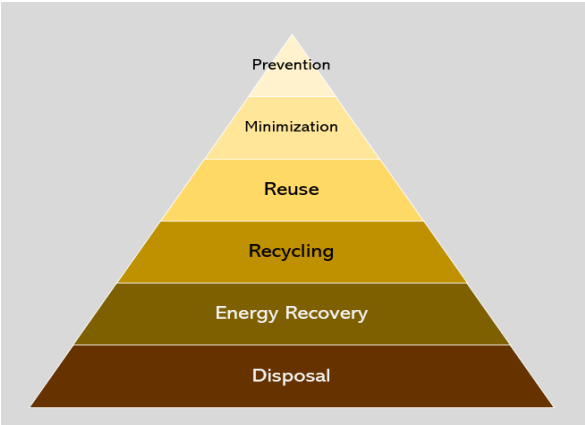


Figure 3. Thailand's current waste management hierarchy

Table 2. A long list of economic and fiscal measures used for plastic packaging waste management

Measure	Definition
1. Tax on Virgin Raw Materials	Packaging material made of primary resources is charged with a tax.
2. Single-Use Plastic Packaging Levies	Single-use plastic packaging items will be charged with an extra tax or a fee.
3. Plastic Credits	Companies that use plastic in their products and packaging pay the projects or groups which collect recyclable plastics and earn 'plastic credits' to offset their plastic footprint.
4. Tax Incentives for Recycling Investment	Industries that engage in recycling processes (e.g., manufacturing recycled products) are entitled to VAT refunds, tax exemptions, or other subsidies from the government.
5. Green Public Procurement	A process whereby public authorities seek to procure goods, services and works with a reduced environmental impact.
6. Tax on Non-recyclable Plastics	Plastic packaging which will not be recycled at post-consumption will be charged an extra tax per the material's environmental footprint, weight, volume, or value.
7. Tax Deduction for the Use of Biodegradable Plastics	Businesses that purchased biodegradable SUPs are eligible for a 125% tax deduction for the purchased amount
8. Consumer's Rebate Scheme	Consumers who refuse a SUP at the sales point will receive cash discounts or redeemable collection points for selected products.
9. Deposit/Return Scheme (DRS)	A deposit is charged when a product with a certain packaging is purchased. The deposit is repaid when the empty packaging is returned to the designated points.
10. Extended Producer Responsibility (EPR)	Producers are given an extended responsibility for the collection, treatment, recycling, reuse, and disposal of packaging at the post-consumer stage.
11. Advanced Disposal Fee	Non-refundable fees levied on individual products at the point of purchase with the fee being built into the price of the product based on the estimated costs of collection and processing.
12. Waste Banks	People collect tradable packaging waste (e.g., plastic, metal, cardboard, glass) and deposit it with the 'plastic banks' or 'waste banks' in exchange for daily food supply (e.g., eggs, rice, water) and sometimes cash or savings.
13. Pay As You Throw (PAYT) charges	Individuals, households, and communities are charged the collection of waste fees based on the waste amount they throw.
14. Incinerator & Landfill Taxes	Incineration tax is an environmental tax paid on top of normal incineration rates by any company, local authority, or other organization that wishes to dispose of waste in an incineration facility. The progressive landfill tax rates are charged to waste companies for dumping waste to discourage excessive waste generation at source and to encourage waste separation.
15. Tax incentives for the Use of Reusable Packaging and Packaging with Recycled Content	Businesses that use reusable packaging and/or packaging with recycled content will be eligible for tax incentives under the set conditions.

2.1 Details of the Measures

1. Tax on Virgin Raw Materials	
Definition	An extra tax will be applied to producers or vendors of monomers, polymers of packaging items made of virgin fossil feedstock, and plastics placed on the market for consumption. The tax rate is based on the weight or the value of a packaging item.
Advantages	▪ Encourage businesses and consumers to use more environmentally friendly alternatives and boost the recycling industry without direct subsidies. ▪ If the tax is high enough and there are alternatives (e.g., lighter, packaging with recycled content), the intended behavior change could be achieved.
Implementation	▪ USA - The draft 'Rewarding Efforts to Decrease Unrecycled Contaminants in Ecosystems (REDUCE) Act' was proposed by Senator Sheldon Whitehouse to establish a new tax on virgin resin, starting at 10 cents a pound in 2022 and increasing to 15 cents in 2023 and 20 cents in 2024. In subsequent years, the tax would be updated based on cost-of-living adjustments. This is a new measure that is not yet implemented anywhere although there are similar measures (e.g., packaging tax) already in place that create similar deterrent impacts.
Considerations	▪ Should be implemented together with other measures, such as a tax on single-use plastic packaging, tax incentives for recycling investment, tax on non-recycled plastic packaging to avoid regrettable substitution. ▪ Technological solutions should be implemented to ensure recycled plastics have the same quality as virgin plastics.

2. Single-Use Packaging Levies	
Definition	Products with SUP packaging will be charged a tax or a fee. Tax revenues will be directed to the local or national government whereas a fee (for using SUP) will be collected at the point of sales and remains with the seller.
Advantages	▪ Designed to discourage consumption of SUP packaging ▪ Expected to influence consumers' and manufacturers' behavior towards reusable packaging or even unpackaged options, if implemented with other incentives (e.g., tax deduction, tax waiver, consumer's bonus scheme)
Implementation	▪ UK, Ireland, Spain, Italy, Croatia, Norway, Scotland, China, among others, are already implementing this measure. In the U.K., a 5-pence fee is charged to customers who request a carrier bag at supermarkets. In Ireland, the application of a €0.22 charge for a SUP bag had led to a 90% reduction in SUP bag usage. In Spain, a draft law is being proposed to impose a levy (€0.45/kg) on manufacturers, importers, or intra-community acquisitions of non-reusable plastic packaging. In Norway, a €0.1308 per unit tax is applied on disposable packaging (e.g., non-refillable beverage containers). ▪ A study in the U.K. showed in just one year after the plastic bag charge was introduced in 2015, the number of plastic bags given by the UK's 7 largest supermarkets dropped by 83%. ▪ Already started in Thailand with certain supermarkets, shopping malls, retail/convenience stores which charge between 1-6 baht for customers who need a carrier bag.

Considerations	▪ Can most easily be implemented when low-cost reusable alternatives (e.g., more durable shopping bags) are available and affordable for large parts of the population. ▪ The available alternatives must constitute a real environmental benefit (e.g., lower carbon footprint) to the SUP packaging (not the opposite). ▪ If used with plastic drink bottles, it may create an overlap with other measures aimed at retrieving used packaging back from consumers, such as the deposit-refund scheme, extended producers' responsibility. Needs to prevent such an overlap.

3. Plastic Credits	
Definition	A mechanism whereby companies that use plastic in their products and packaging pay the projects or groups which collect recyclable plastics and earn 'plastic credits' to offset their plastic footprint. The price mechanism is governed by a third-party accreditor
Advantages	▪ Designed to reward improved waste collection, sorting, and recycling thereby minimizing environmental impact to ecosystems, lowering carbon footprint and waste management cost. ▪ Provides extra income for low-income communities who participate in the program and can build on existing waste bank programs in the community.
Implementation	▪ Implemented through different names by different groups (e.g., Circular Credits, Social Plastic Collection Credits, Neutralization Certificates, Ocean Bound Plastic Credits) in India, Vietnam, Brazil, Mexico, Indonesia. ▪ SecondLife – Thailand, a social enterprise, was certified in connection with the Plastic Waste Reduction Program (by Verra).
Considerations	▪ Carbon credits may be 'proprietary' or 'third-party' and are typically generated through micro, small, or medium-scale project operations. ▪ To make it work, there must be plastic credit registries and trading platforms established and a real-time trading system in place for indicating prices and qualities. ▪ Will work well with a well-run EPR program or waste Banks ▪ At the moment, global standards are being developed to assure and describe the quality of different plastic credits.

4. Tax Incentives for Recycling Investment	
Definition	Industries that engage in recycling processes either for commercial purposes or internal consumption are entitled to VAT refunds, tax exemptions, or other subsidies from the government.
Advantages	▪ Creates a clear signal of support for the recycling industry and relevant players in the country ▪ Helps increase the price competitiveness of recycled products in the market ▪ Increases the availability of affordable recycled products in the market due to increasing supply ▪ Indirectly encourages separation of waste at sources

Implementation	▪ China authorized a 50% VAT refund for the sale of several self-produced products, such as paper products made of bagasse, alumina made of fly ash and gangue, metals made from industrial metal waste, yarns, fabric, among others. ▪ Indonesia introduced a lowered VAT from 10% to 5% for recycling businesses. However, the program failed to increase demand for recycled products because recycling businesses have to wait until the products are sold to enjoy this benefit. ▪ Thailand's Board of Investment has rolled out several tax incentives packages for the recycling industry (e.g., converter, recycler) and start-ups that develop/deploy applications or digital platforms to resolve development challenges, such as plastic problems.
Considerations	▪ While closed-loop recycling is highly desired, downcycling for certain products (e.g., construction materials) could create a value addition, durability, and avoidance of virgin materials for the final products. ▪ Other financial incentives (e.g., soft loans) and technical capacity-building may also be needed for smaller enterprises to enter the market. ▪ Smaller waste shops and informal waste collectors who play a crucial role in the recycling ecosystem should be supported by the government to continue their role.

5. Green Public Procurement	
Definition	A measure that aims to promote environmentally friendly goods and services through the government procurements due to their large volume of orders/procurements.
Advantages	▪ Promotes sustainable production and circular economy ▪ Boosts demand for recycled plastic products within Thailand thereby increasing the supply of recycled plastic products which will indirectly secure the prices of local recyclable waste ▪ Supports existing recycling industry and encourages more recycling investment in the country
Implementation	▪ Many countries in North America, Europe, Asia, Australia, and New Zealand. ▪ In Thailand, PCD has launched a voluntary guideline for green packaging procurement in 2021 covering plastic and paper packaging. However, it is not yet been implemented due to a lack of qualified vendors.
Considerations	▪ Will work well if implemented along with tax incentives for recycling investment to ensure sufficient supply in the country. ▪ Private sector companies are encouraged to come up with a similar policy to help boost local demand for recycled products and increase investment in the recycling industry. ▪ GPP must be made mandatory to see the success or further incentives must be offered to compliant procuring agencies if it will remain to be a voluntary measure.

6. Tax on Non-Recycled Plastics	
Definition	A tax is applied to SUP packaging materials that will not be recycled after their use. The tax rate is determined by the material's environmental footprint, weight, volume, or value.
Advantages	▪ Creates a strong signal for SUP packaging reduction. ▪ Promotes sustainable production and reduction of virgin plastic resin consumption for new packaging ▪ Creates demand for recycled raw materials in the market before requiring all plastic packaging to be recycled plastics ▪ Helps reduce GHG emissions by not using virgin feedstock.

Implementation	▪ EU – Starting in Jan 2021, the EU has rolled out a tax of 0.8 euro/ kg for non-recyclable plastic packaging which applies to all member states. For the moment, most Member States decided to cover their contribution directly from their state budgets. It is yet to be seen how many countries will eventually impose this new tax on plastic packaging products in the future. This reveals an implication that the intended effect of the tax will not directly influence the efforts towards increased recycling rates. No other countries outside the EU seem to have rolled out this measure yet
Considerations	▪ It is highly recommended this measure be undertaken with increased investment in waste segregation and recycling infrastructure. ▪ Detailed recycling traceability assessment and verification process, as well as a registry, must also be put in place to ensure compliance. Enforcement must be done regularly to ensure effectiveness.

7. Tax Deduction for the Use of Biodegradable Plastics	
Definition	Retailers or companies that purchase degradable plastic packaging are entitled to a 125% tax deduction from the total purchase value.
Advantages	▪ Helps boost local demand for biodegradable SUPs in Thailand ▪ Supports farmers who grow raw materials (e.g., cassava, corn, sugarcane) and domestic producers of biodegradable products and resin
Implementation	Thailand - Applicable products include carrier bags, garbage bags, cups, plates/bowls, cutlery, straw, bottles, cup closures, soil cover plastic sheet, nursery bag, cup sealing film. The measure expired in Dec 2021 but has been extended to 2024. The purchase must be made with the registered suppliers authorized by the state revenue agency. Only certain types of biodegradable plastics are eligible for this incentive.
Considerations	▪ While this is promoted as a solution under the government's Bio, Circular, Green Economy policy, biodegradable plastics cannot be recycled, require proper collection and disposal procedures which is not widely understood by most people. ▪ If it continues to be used, a clear label should be placed on the packaging for a proper segregation process. ▪ It does not encourage the principle of reducing, reusing, and recycling which is the fundamental principle of the circular economy.

8. Consumer's Rebate Scheme	
Definition	Consumers who refuse a SUP at the sales point will receive cash discounts or redeemable bonus points which can be turned into cash discounts or selected products.
Advantages	▪ Helps raise public awareness about the SUP packaging problem ▪ Easily deployed/continued as it has been in use in Thailand by retailers for some time ▪ Receives good cooperation from the private sector
Implementation	Thailand – implemented with notable success by leading supermarkets, shopping malls, mega stores, convenience stores, and coffee shops.
Considerations	▪ Will work best if implemented with other penalty measures (e.g., tax on non-recyclable plastic packaging measures) to create the push-pull effect towards behavioral change. ▪ Cash discounts or redeemable points should also be made for eco-labeled products.

9. Deposit-Refund Scheme	
Definition	A deposit is charged when a product with a certain packaging is purchased. The deposit is repaid when the empty packaging is returned to a point-of-sale. There may be a one-way deposit (items collected for recycling) or a two-way deposit (refillable and reusable items e.g., glass, thicker plastic bottles).
Advantages	▪ Creates a system for empty SUP packaging to be retrieved for recycling. ▪ Fosters recycling and reuse mindset in the public ▪ Can be used with products where the empty packaging can cause environmental health to the public, such as fertilizer, pesticide
Implementation	Many countries in Europe (e.g., Germany, Norway, Sweden, Denmark, Netherlands), Hong Kong, Taiwan, South Korea, Japan, Canada, and some states in the US have already adopted this measure and some with evidence of success. The most common applicable products are food and beverage containers, cosmetics packaging, and cleaning products.
Considerations	▪ DRS has a time and logistics cost for consumers, retailers, and manufacturers. For example, if the deposit is too low, the logistics are too much and the consumer's time is too valuable, the items might not be returned. ▪ Lower-income citizens may be more likely to participate for enhanced economic benefit. ▪ This measure will be more effective if coupled with the Extended Producers Responsibility measure. ▪ May be applied with the 'Reuse-As-A-Service' model on food delivery/takeaways where the service providers expect the packaging/container to be returned after use for repeat uses.

10. Extended Producer Responsibility	
Definition	A concept that acknowledges that producers of consumer goods bear some financial responsibility for the management of waste collection, treatment, recycling, and disposal resulting from their sales at the post-consumption stage.
Advantages	▪ Provides incentives to prevent wastes at the source, promotes product's eco-design ▪ Support the achievement of public recycling and materials management goals ▪ Minimizes littering on land, marine, and coastal areas and helps extend the life of landfills ▪ Enables relatively clean recyclable packaging back into the system
Implementation	▪ Germany was the first country to adopt this measure through the German Packaging Ordinance (1991) for packaging waste. ▪ Now implemented in many countries in Europe, Asia (Japan, Korea, Taiwan, India, Vietnam), and North America. ▪ A voluntary EPR program was launched in Dec 2021 and on-ground implementation is expected to start later in 2022 in three municipalities of Chonburi Province, Thailand.
Considerations	▪ An effective EPR implementation requires law and guidelines that will define the scope, roles, and responsibilities of stakeholders, price structure, and supporting infrastructure. ▪ EPR fee must also be set high enough to discourage non-recyclable packaging and to incentivize environmentally friendly packaging. ▪ Smaller producers of plastic packaging must be engaged to share the cost and prevent the free riders (i.e., companies that do not shoulder the handling and disposal costs but enjoy the benefit from a running EPR program. ▪ If not carefully designed, an EPR may create a lock-in leading to thermal recovery rather than a meaningful reduction, reusability, and recyclability of packaging. To mitigate such a problem, the EPR fee may also factor in reusability and recyclability. Additional policies may also be needed to help promote 'reuse' and 'recycle'.

11. Advanced Disposal Fee	
Definition	ADFs add end-of-life product management costs to the cost of the product, thereby internalizing costs that are often externalized to the environment. Unlike deposits, they are non-refundable to the consumer. It is modeled on the polluter pays principle.
Advantages	▪ Can influence both consumers' and manufacturers' behaviors with clear and regular communication. ▪ Can contribute to increased recycling rates when ADFs are used to support the collection and recycling programs; however, they do not incentivize participation in those programs.
Implementation	▪ Several U.S. states, Canada, and European countries as well as South Korea. ▪ Jars, bottles, cans, and beverage containers made of glass, plastic, plastic-coated paper, and mixed material are examples of containers with ADF charged. ▪ Containers used for medicine, medical devices, drugs, or other medical items are exempt in some countries. ▪ Containers made of materials with a set recycled content target (e.g., 30%, 50%), such as aluminum and steel containers, are usually not subject to the ADF.
Considerations	▪ ADFs provide a secure funding source that could potentially fund recycling programs; however, they are unlikely to directly encourage the recovery of packaging material unless coupled with other programmatic approaches. ▪ Without a clear messaging, consumers may not be aware of the ADFs, hence defeating the purpose of the measure. ▪ A deposit-refund scheme, implemented along with an EPR program, may work better in terms of internalizing the handling/disposal costs of empty packaging and directly contributes to the country's increased recycling rate.

12. Waste Banks	
Definition	People collect tradable packaging waste (e.g., plastic, metal, cardboard, glass) and deposit it with the 'plastic banks' or 'waste banks' in exchange for daily food supply (e.g., eggs, rice, water) and sometimes cash or savings.
Advantages	▪ Helps address environmental problems and offers economic benefits at the same time. ▪ Helps alleviate economic hardship for poor communities esp. in times of Covid-19. ▪ Easily deployed, no law required. ▪ Facilitates the collection of quality SUP packaging waste for the recycling process, thereby minimizing the reliance on virgin resin. ▪ Promotes waste segregation mindset and habit in the public.
Implementation	Several countries, such as the Philippines, Indonesia, Brazil, Egypt, Colombia, Thailand, and Vietnam.
Considerations	▪ Works best in the lower-income rural communities where the formal waste collection is not well covered and access to the waste shops or informal waste collectors is also difficult. In such a context, a waste bank can help increase the environmental awareness of the community while also providing an economic incentive for them to participate. ▪ May be streamlined with the EPR or plastic credit programs. ▪ In Thailand, some waste banks also provide welfare services (e.g., funeral allowance for members) and function like a savings cooperative where members pay their due by the trash they bring to the waste bank.

13. Pay As You Throw	
Definition	Individuals, households, and communities are charged the collection of waste fees based on the waste amount they throw. Waste fees paid by users are modulated according to the amount of mixed waste delivered to the waste management system.
Advantages	▪ Creates fairness on waste management for citizens using the polluter-pays principle. ▪ Stimulates waste separation at source and the 3Rs principle. ▪ Helps achieve the country's circular economy, plastics management roadmap, climate change, and other related goals.
Implementation	Widely adopted in many countries in Europe, North America, and Asia (Taiwan, Japan, South Korea)
Considerations	▪ A fee structure shall be chosen in consultation with waste managers and municipal accounting/financing staff. ▪ It typically works well if there is a flat rate minimum fee combined with a variable amount depending on the actual waste amount and possible on the waste fractions/quality. ▪ Special rates may be needed for urban and rural communities and lower-income communities. ▪ If fees are set too high, people may illegally dump their trash in other unregulated areas or burn it. ▪ The US EPA has a manual with detailed guidelines on how to implement this measure successfully.

14. Incineration and landfill Taxes	
Definition	Incineration tax is an environmental tax paid on top of normal incineration fees by any company, local authority or other organization that wishes to dispose of their waste at an incineration facility. Incineration operators are liable for the tax, but costs are passed on to users at higher prices. Similarly, the landfill tax uses a similar principle where it is applied to those who want to dispose of waste at a landfill.
Advantages	▪ The tax is used as a disincentive to discourage people from giving all their trash to the municipal garbage trucks and to encourage the reduction of SUP packaging, recycling, and reuse habits.
Implementation	▪ The Netherlands - In Jan 2020, the Dutch government expanded its tax on incinerated domestic waste to include imported waste. ▪ Sweden - Sweden introduced a new incineration tax in Apr 2020, after a previous failed attempt in 2006-2010. ▪ The UK - In early 2020, the UK Parliament debated the introduction of an incineration tax, together with a halt to new investment in energy-from-waste facilities, but the action was halted as a result of the COVID-19 outbreak. ▪ Austria – the parliament introduced a landfill tax, landfill ban, and eventually an incineration tax in 2006.
Considerations	▪ The introduction of a landfill tax needs to be accompanied by a ban or at least strong restrictions of waste export to other countries if the shipping cost is lower. ▪ Both taxes will work best if organic waste is segregated at the household level and the collection, sorting, recycling processes are enabled/promoted. ▪ New incinerators and landfills with modern improved technology can create lower environmental impact (e.g., GHG cut by up to 80%), hence, different tax rates are needed for new and old technologies.

15. Tax incentives for the Use of Reusable Packaging and Packaging with Recycled Content	
Definition	Businesses that use reusable packaging and/or packaging with recycled content will be eligible for tax incentives under the set conditions.
Advantages	▪ Provides an incentive for the reduction of single-use plastic packaging consumption by businesses (e.g., food delivery, refill stations) by promoting the use of reusable packaging. ▪ It also aims to incentivize the production and consumption of packaging with recycled content (e.g., manufacturers, retailers).
Implementation	This has not yet been implemented anywhere. In February 2018, following the European Commission's proposal to member states to apply more flexible VAT rules within their states, the European Federation of Waste Management and Environmental Services (FEAD) members proposed to lower or zero VAT rates on products with recycled content as a measure to address the single-use plastic packaging problem in the member states. This measure, therefore, proposed to apply a VAT refund for reusable packaging as an additional choice.
Considerations	▪ Types of businesses and/or products to be applied with this measure must be carefully scoped as it would give different impacts at different stages of the supply chain and require different sets of requirements. ▪ The verifications and certification processes as well as a thorough analysis of the tax laws in different countries are also important and needed.

2.1.1 Additional considerations

Lessons from different countries show a successful implementation of these measures will be dependent on several common but important factors:

- The thorough planning process and engagement/consultations with all concerned stakeholders throughout the supply chain.
- Legislation regulating the measures will be needed to create a level playing field for all concerned players with a transition period for concerned stakeholders to prepare.
- Tax legislation must define the point of charge, covered products/exemptions, tax base, tax rates, documentation, and collection.
- Specific criteria and rules must be laid out before the introduction of measures while adjustments to them would be needed over time to reflect the reality.
- Clear policy and guidelines for each measure are needed.
- Alternative solutions to SUP packaging must be made available and affordable.
- Revenues collected from penalty measures must be directed towards strengthening alternative solutions and strengthening the segregation, sorting, and recycling systems in the country to close to waste loop.
- Consistent communication with concerned stakeholders must be maintained to ensure their buy-in and cooperation. A central communication portal or website will be useful in communicating up-to-date information to stakeholders and informing them of the progress and results.
- Baseline information will be needed before the introduction of measures and a functioning monitoring and reporting system must be in place.

Finally, no single measure should or can be implemented in isolation from other measures as it may create a loophole for non-compliance. In some cases, incentive measures should be introduced concurrently with disincentives to create the push and pull effects.

2.2 Measures prioritization

From the longlisted measures above, this section presents a methodology to prioritize selected measures that are considered to have the feasibility of successful implementation if implemented in Thailand. These measures will be subject to further analyses to examine their viability and applicability to Thailand's context. The following criteria are used for the prioritization:

a) Potential impact to reducing single-use packaging waste and/or increasing consumption of recycled products. (10 points)
b) Support Thailand's priority of the Bio, Circular, and Green (BCG) Economy Model, Circular Economy Strategy, Plastic Waste Management Roadmap (2018-2030), and Action Plan (2020-2022). (15 points)
c) Implementable under existing legal, regulatory, or policy frameworks or with their amendments. No new legislation required (15 points)
d) Evidence of success from within Thailand or other countries (10 points)

2.2.1 Methodology

Each measure is laid out against the criteria and was assigned the scores based on the degree to which it relates to the criteria. A recycling logo (♻) is used to represent a 5-point score. Each criterion has different a maximum score ranging from 10-15 points. It must be noted the degree of relevance to each criterion was assigned based on preliminary desktop research and the author's experience with the plastic packaging issue in Thailand. Prior research and studies done by academic institutes were also used in the scoring evaluation. In the end, measures that received 25 points or higher will be selected for further SWOT analysis.

2.2.2 Selection results

Eleven measures with scores of 25 points or higher are selected. These include (1) Green Public Procurement, (2) Consumer's rebate schemes, (3) Extended Producer's Responsibility, (4) SUP Packaging Levies, (5) Tax Incentives for Recycling Investment, (6) Deposit/Refund Scheme, (7) Waste Banks, (8) Tax Incentive for Biodegradable Single-Use Plastics, (9) Tax on Non-recyclable Plastics, (10) Pay-As-You-Throw, and (11) Tax incentives for the use of reusable packaging and packaging with recycled content.

Table 3. Scoring results of the selection of measures

Measures	Criteria				Total score
	a	b	c	d	
Tax on Virgin Raw Materials	♻	♻♻	♻		20
SUP Packaging Levies	♻♻	♻♻	♻♻	♻♻	40
Plastic Credits	♻	♻	♻	♻	20
Tax Incentives for Recycling Investment	♻♻	♻♻♻	♻♻	♻	45
Green Public Procurement	♻♻	♻♻♻	♻♻	♻♻	45
Tax on Non-recyclable Plastics	♻♻	♻♻	♻	♻	40

Tax Deduction for Biodegradable Plastics		♻♻♻	♻♻♻		30
Consumer's Rebate Scheme	♻♻	♻♻	♻♻♻	♻♻	45
Deposit-Refund Scheme	♻♻	♻♻♻	♻♻	♻♻	45
Extended Producer Responsibility	♻♻	♻♻♻	♻♻	♻♻	45
Advanced Disposal Fee	♻	♻	♻	♻	20
Waste Banks	♻	♻♻♻	♻♻♻	♻♻	45
Pay As You Throw (PAYT)	♻	♻	♻♻	♻	25
Incinerator & Landfill Taxes	♻	♻	♻	♻	20
Tax incentives for the use of reusable packaging and packaging with recycled content	♻♻	♻♻	♻		25

These prioritized measures possess a certain (or strong) degree of relevance to the core policy frameworks as presented in the criteria and some cases (e.g., **EPR, DRS**) are referenced specifically in the plastic waste management road map and action plan, hence an increased likelihood of becoming the implementing measures. Two measures—consumer rebate schemes and waste banks—have already been implemented voluntarily across the country with relative successes. For example, started as a school recycling program to teach the students about waste separation and recycling habits, the **waste bank** programs have now grown across the country with support from NGOs, companies, and local governments. Some of them have evolved to offer social welfares for their members (e.g., funeral allowance, life insurance support) and are supported by the local governments. Such programs should be continued and leveraged to supplement measures such as EPR and DRS.

The **consumers' rebate program** was initiated by the leading retailers (e.g., supermarkets, convenience stores, department stores) to incentivize their customers to comply with the government's 'Every Day, Say No to Single-Use Plastic Bags' policy and campaign. Successes of the program are noted. For example, 7-Eleven has started its own campaign since 2018 (before the plastics roadmap took effect on 1 January 2020) and has reported saving 998 million SUP bags totaling 134 million baht (as of January 2020) for which the savings was used to buy medical equipment for hospitals.[23] Some retailers have donated the savings from the program to charity foundations, schools, and hospitals. Similar to the waste banks, this program/measure should be continued with support from the private sector itself as it provides leverage for other measures, such as SUP packaging levies.

Green public procurement has been implemented in Thailand for many years covering several sectors totaling 39 categories. Plastic packaging is already included as one of the categories although there are no registered vendors on the list yet. This gives an impetus for an incentive measure for the recycling industry (measure 4) to help increase the domestic supply of recycled products to meet the government's green procurement requirements. Green public procurement should also be made mandatory once there are sufficient suppliers available.

[23] The campaign continued until 2021

Four measures received the equally lowest score (20 points)—a tax on virgin raw materials, plastic credits, advanced disposal fee, and landfill/incineration tax—and therefore are not shortlisted for the next stage.

Imposing a **tax on virgin raw materials** may create a potential impact to reduced single-use packaging waste as the tax is expected to make the price of SUP packaging substantially higher thereby prompting product owners to use an alternative material or solution. It is aligned with relevant national frameworks (criterion 2) if its intended effect can be realized. However, if this measure were to be used with plastic product substances such as vinyl chloride and various forms of ethylene or propylene, it may cause a ripple effect with other products which rely on the same substances, such as auto parts, bottles, food containers, among others[24], thereby triggering protests by some industries and consumer groups.

The **plastic credits** program is a very new concept and does not necessarily promote reduced consumption of single-use plastic packaging. It responds partially to the plastic roadmap, BCG, and circular economy strategy but has no clear evidence of success in any country. It is also questionable to be implemented legally in Thailand due to the absence of relevant regulations.

Imposing an **advanced disposal fee (ADF)** to a product is technically part of an EPR program. The measure itself may or may not lead to the reduction of single-use plastic packaging without an established rule on how the fee will be managed and used by whom as well as clear communication with the consumers. Its potential impacts on the reduced consumption of SUP packaging and increased consumption of recycled products are indirect and questionable. In the USA, it has created mixed results as the consumers are not made aware of the higher cost of a product due to an ADF but end up paying more. It is recommended that this be part of the EPR measure.

With regard to the **landfill tax**, this will involve applying an additional tax on top of the existing tipping fee rates. Any local taxes to be applied or raised require support from the Ministry of Interior which governs all local administrations and the Ministry of Finance which oversees budget allocation and spending of all government units. The same principle applies to imposing an **incineration tax** on top of the rates already being paid. The process of making the request and acquiring the approvals is technically onerous and time-consuming and, therefore, recommended by government stakeholders that other measures be considered instead.

Moreover, solid waste incineration is gaining momentum in Thailand with the growing number of new refuse-derived facilities (RDFs) and waste-to-energy facilities being set up and in operation in many provinces recently. Many more are also in the pipeline. These technologies are viewed by many[25] as a solution for the mounting untreated waste as they can reduce waste volume substantially. However, this implies a lack of general understanding, especially by the authority, about sustainable waste management and principle of circular economy. Waste incineration does not necessarily lead to reduced packaging waste or increased uptake of recycled products, nor are they well aligned with the BCG, Plastics Waste Management Road Map, and action plan, hence the equally lowest score with the plastic credits and tax on virgin raw materials measures.

[24] Popattanachai, N. (2020)
[25] Including the Ministry of Energy

SECTION 3

SWOT Analysis of Prioritized Measures

3.0 SWOT analysis of prioritized measures

Following the prioritization of measures as presented in the previous section, eleven measures have been selected based on four shortlisting criteria:

e) Potential impact to reducing single-use packaging waste and/or increasing consumption of recycled products.
f) Support Thailand's priority of the Bio, Circular, and Green (BCG) Economy Model, Plastic Waste Management Roadmap (2018-2030), and respective Action Plan (2020-2022).
g) Implementable under existing legal, regulatory, or policy frameworks or with their amendments.
h) Evidence of success from other countries or within Thailand.

Prioritized Measures

2 - Single-use plastic packaging levies
4 - Tax incentives for recycling investment
5 - Green Public Procurement
6 - Tax for non-recycled plastics
7 - Tax deduction for the use of bio-degradable single-use plastics
8 - Consumers' rebates
9 - Deposit-Refund Scheme
10-Extended Producer Responsibility
12-Waste Bank
13-Pay As You Throw
15-Tax incentives for the use of reusable packaging or packaging with recycled content

This chapter investigates the strengths, weaknesses, opportunities, and threats (SWOT) of each prioritized measure to gain a deeper understanding of its advantages and opportunities for successful application in Thailand. The exercise also seeks to identify key weaknesses and threats of the measures for which mitigation measures may be undertaken to minimize the shortfalls.

The analysis is strengthened by interviews with experts, bilateral and focused group meetings with relevant stakeholders, including government agencies, businesses, social enterprises, NGOs, academia, and international organizations (see the list of stakeholders interviewed in Annex I). The strengths, weaknesses, opportunities, and threats of each prioritized measure were assessed based on the socio-economic and political contexts in Thailand and substantiated by insights shared during the interviews and meetings with industry experts and stakeholders. Their analyses are discussed in the ensuing sections. The conditions and considerations for good design and implementation are also presented for each measure.

3.1 Single-Use Plastic (SUP) Packaging Levies

Definition. Products with SUP packaging will be charged a tax or a fee. Tax revenues will be directed to the local or national government whereas a fee (for using SUP) will be collected at the point of sales and remains with the seller. This measure can be applied at different stages—to the manufacturers (who make SUP packaging), retailers or distributors (who provide free SUP bags or use SUP film for wrapping fresh food products), and consumers (who request a SUP carrier bag or cup). The same principle can be applied to other SUP products such as cutlery and straws.

Objective. This measure aims to change consumers' behavior on the consumption of SUP packaging by creating a deterrent effect on the price of products with SUP packaging (i.e., a higher price than products without).

Figure 4. SWOT analysis of the single-use plastic packaging levies

STRENGTHS	WEAKNESSES
⦿ Creates a condition for the consumption of SUP packaging. If applied to the up-or mid-stream players, such as producers, wholesalers, retailers, the price margin will likely be passed down to consumers. ⦿ Employs the 'Polluter Pays Principle'. ⦿ Sends a clear signal to the public about the consequences of excessive SUP consumption on the environment.	⦿ If used without alternatives or accompanying measures to encourage 'reuse' or 'recycle', it may lead to public outcry and non-compliance ⦿ May lead to the use of other single-use materials (e.g., bioplastics) or even reusable packaging with more energy/resource-intensive to produce (e.g., cotton bags[26]). ⦿ Could create a greater burden to the lower-income population due to the increased price of products, if a tax is applied at the production stage. ⦿ Increased price burden may compound the economic hardship on people caused by the Covid-19-induced measures thereby making it an unpopular measure to roll out during this time
OPPORTUNITIES	**THREATS**
⦿ A reward measure is being implemented in Thailand's supermarkets and convenience stores where consumers who bring their own bags, baskets, cups, boxes will be given a cash discount or collection points which can be turned into discounts later. ⦿ A similar reward measure may be created where the redemption may include discounts for utility services (e.g., household power consumption cost). ⦿ Thailand's plastic roadmap has set banning targets for select types of SUPs in three stages during 2019 to 2027. SUP cups and Styrofoam food boxes are subject to being banned by 2022. This measure contributes to the implementation of the roadmap.	⦿ Thai treasury law does not allow earmarking tax revenue for special purposes, thus collected revenue from this measure will not necessarily be used for promoting other activities to close the loop unless a dedicated fund will be set up (see Conditions section). ⦿ Similarly, the value-added tax (VAT) can only be applied at 7%, hence not a viable tool. ⦿ Takeaway coffee or tea continues to be served only in SUP cups[27]. ⦿ Some coffee shops are now using biodegradable cups which require separation from other packaging and proper disposal after use. ⦿ The government continues to promote the use of plant-based biodegradable plastic packaging, perpetuating SUP packaging usage.

Conditions

- This measure, if applied to Thailand, should target addressing SUP bags consumption outside of supermarkets, shopping malls, convenience stores that have already participated in the nationwide 'Every day, Say No to Single-Use Plastic Bags' campaign launched in 2020. Customers to these establishments are now required to pay THB 1-6 baht per bag if they need one. This leaves the remaining and bigger gap in the smaller shops, food stalls, and fresh markets where SUP bags are still being given ubiquitously.
- Close coordination and consultations among relevant government agencies and private sector groups (i.e., Ministry of Industry, Ministry of Finance, Ministry of Commerce, Ministry of Natural Resources and Environment, Federation of Thai Industries, Thailand's Institute of Packaging Management for Sustainable Environment, Thai Chamber of Commerce) are needed to

[26] Cotton bags require extensive resources and processes to produce from seedling to planting, harvesting, dying, sowing, etc. therefore they require several dozen reuses to offset their high carbon footprint.
[27] Following advice from the Ministry of Public Health, most branded coffee shops have temporarily stopped accepting reusable cups/tumblers due to concerns over Covid-19 contaminations.

identify the applicable types of plastic packaging[28] and conditions. A working group comprising representatives from these stakeholders will need to be set up while technical input from the academia and supporting organizations should be sought.

- An initiating body will be required to lead the setup of this measure and drive the process of winning support from all relevant agencies and stakeholders. This may be one of the working groups under the plastic and hazardous waste management sub-committee.
- If the levy is in a form of a tax, it is recommended to be applied with the producers.
- There needs to be a receiving fund for the collected revenue for which the proceeds must be used to promote recycling and reuse activities. This may be either an existing fund or a new fund; however, setting up a new fund requires a royal decree initiated and enacted by a government agency. While the Environment Fund may seem to be an appropriate one, its current revenue stream model (i.e., central budget) and conditions for fund usage are posing a challenge for using it.

Other Considerations

- A social behavioral change campaign will be required to create a heightened awareness of the public about the ubiquitous consumption of SUP packaging and its consequences to the environment, economy, and society.
- Alternative environmentally friendly and low carbon packaging will need to be introduced before this measure will be rolled out. Eco-design packaging will enhance better compliance and must be supported.
- Biodegradable plastic packaging, if it continues to be promoted, must be properly labeled. Its usage should be controlled (only to specific types of activity e.g., agriculture, wet trash) and proper disposal must be ensured. The public must also be made aware of the conditions of this type of packaging to prevent confusion with other recyclable plastics, such as PET.

3.2 Tax incentives for recycling investment

Definition. Industries that engage in recycling businesses or processes (e.g., collecting, recycling, processing) are entitled to VAT refunds, tax exemptions, or other subsidies from the government.

Objective. This measure aims to encourage increased consumption of recycled products and create more supply for recycled products in the market, providing a basis for the circular economy.

Figure 5. SWOT analysis of tax incentives for recycling investment

STRENGTHS	WEAKNESSES
⦿ Creates a clear signal of support for the recycling industry and relevant players in the country ⦿ Helps increase the price competitiveness of recycled products in the market ⦿ Increases the availability of affordable recycled products in the market due to increasing supply ⦿ Encourages separation of waste at sources	⦿ The measure alone will not lead to increased recycling activities in the country if there are no effective collection, gathering, and sorting systems within the country to ensure the quantity and quality of recyclable materials going into the recycling process. ⦿ Imported recyclable materials will undermine efforts to promote the circular economy, 3Rs principle in the country

[28] May start initially with the food sector as it contains the highest volume of SUP packaging

OPPORTUNITIES	THREATS
⦿ There are already many waste separation awareness campaigns in schools, universities, shopping malls, companies, and large public/commercial buildings. But more educational campaigns are needed to improve people's understanding about types of waste which match different bins. ⦿ Global demand for post-consumption recycled (PCR) content in plastic packaging is expected to prompt domestic producers to prepare for more investment in the recycling industry. ⦿ Thailand's Board of Investment already offers tax incentives for the recycling industry and start-up which engages/promotes recycling activities. ⦿ There are already many informal waste collectors across the country who collect plastic bottles, glass, metal, paper from households and buildings. ⦿ Responds to specific actions in the Plastic Management Roadmap Action Plan (2020-2022)	⦿ Continued lack of quality recyclable materials in the country caused by fragmented waste separation and collection systems. ⦿ If no control is put in place, there may be recycled SUP carrier bags in the market; hence defeating the purpose of reducing the number of SUP bags ⦿ Producers continue to make complex plastic packaging (e.g., flexible plastics) which is difficult and costly to recycle. ⦿ Low crude oil price may deter investment decision ⦿ The import of plastic waste is allowed to continue, undermining the in-country effort to promote waste separation at source to ensure clean recyclable waste streams.

Conditions

- Incentives must be specific to target actors (e.g., recycled resin producers, recyclers, waste shops) and product prices must be set competitive to conventional plastic products.
- Waste separation at the source must be ensured to achieve quality plastic packaging waste feedstock. This will require impactful and continuous public awareness education and facilitation (i.e., collection of separated waste).
- Most recycled products in the Thai market are downcycled products (e.g., flowerpot, brick, plank, outdoor furniture, SUP bags) or upcycled products (e.g., PPE suit, T-shirt, monk's robes). Closed-loop recycling must be made an ultimate goal but needs public awareness campaigns and infrastructure put in place to ensure clean and well-sorted waste will be collected.
- Must be implemented along with other supplemental measures, such as the SUP packaging tax, green public procurement, extended producers' responsibilities to optimize results.

Other Considerations

- In-country informal waste collectors should be formally recognized and supported with training and welfares to incentivize their work to bring in the quality feedstock.
- While closed-loop recycling is highly desired, downcycling for certain products (e.g., construction materials) will create the value addition, durability, and avoidance of virgin materials for final products.

3.3 Green Public Procurement

Definition. Green Public Procurement is a process whereby public authorities seek to procure goods, services, and works with a reduced environmental impact throughout their life cycle when compared to the conventional procurement process. It is a voluntary instrument that typically targets government procurements due to their large volume of goods and services. Apart from products, such as paper, food, cleaning products, IT equipment, electrical appliances, lighting equipment, etc., GPP is also used for services, such as catering, events, delivery systems, etc. where packaging waste is one of the major issues.

Objective. This measure aims to cause a shift towards more sustainable production and a greater focus on reduction, reuse, and recycling of packaging materials by creating increased market demand for recycled packaging and products thereby encouraging more recycling investment in the country.

Figure 6. SWOT analysis of green public procurement

STRENGTHS	WEAKNESSES
⦿ Promotes sustainable production and circular economy. ⦿ Boosts the demand for recycled plastic products within Thailand thereby increasing the supply of recycled plastic products which will indirectly secure the prices of local recyclable waste. ⦿ Supports the existing recycling industry and encourages more recycling investment in the country.	⦿ May cause increased procurement budget initially due to the current higher cost of recycled products or packaging. ⦿ Insufficient quality and quantity of recycled raw materials in the country will hamper the price competitiveness of sustainable/recycled packaging. ⦿ Without government support in the recycling industry, sustainable/recycled packaging and products will likely be more costly to make than products made from virgin plastic resin.
OPPORTUNITIES	**THREATS**
⦿ Certain Thai packaging manufacturers are already investing in sustainable packaging, hence the available supply of certain products in the country. ⦿ Green Public Procurement is already in effect in Thailand but voluntarily. ⦿ Referenced specifically in the Plastic Roadmap Action Plan as a measure to be promoted. ⦿ If implemented with Measure 4, it will help induce higher demand for recycled products/packaging and lower demand for SUP packaging.	⦿ Limited in-country green suppliers will make the procurement budget higher, thus a lower chance to receive support from the Comptroller General Office (Ministry of Finance). ⦿ Low crude oil price may make virgin SUP packaging cheaper than recycled packaging thereby causing a higher procurement budget. ⦿ Lack of a high-level political champion from MoNRE to drive this measure forward with the Ministry of Finance.

Conditions

- There needs to be a strong and continuous push from the Ministry of Natural Resources and Environment to make the current Green Public Procurement policy a requirement, not voluntary, based on the country's net-zero emissions commitments. A pitch should be made based on the projected avoidance of GHG emissions and government budget savings.
- Effective communication with existing producers and vendors of recycled plastic products is needed. Currently, there is no registered vendor in the packaging category of the government procurement system.

Other Considerations

- Currently, two main factors that determine successful public procurements are technical specifications and price competitiveness. Where the products do not require highly technical specifications, procuring agencies usually opt for bidders with the lowest price. As an initial step, the types of plastic products and packaging should be broadened from their existing list and an incentive should be offered to agencies that consider these products if GPP continues to be voluntary.
- It is reported the Federation of Thai Industries has started to explore adopting similar practices within its members. This is a good sign and the guidelines for both the public and private sector procurement should be developed and pursued concurrently to create a market momentum and increased demand for recycled plastic products.

- The EU Green Public Procurement Manual on Plastic Waste Prevention (2014) is a good resource for both the government and private sector to learn and adopt/adapt the good practices from the EU. Currently, there is a general lack of understanding and potential about this measure in the plastic waste context.

3.4 Tax on Non-recycled Plastic Packaging

Definition. A tax is applied to SUP packaging materials that will not be recycled after their use. The tax rate is determined by the material's environmental footprint, weight, volume, or value.

Objective. This measure aims to create a disincentive for the use of packaging materials that are not going to be recycled after their use thereby helping make recycled plastic packaging more attractive for producers and consumers due to their lower prices.

Figure 7. SWOT analysis of tax on non-recycled plastic materials

STRENGTHS	WEAKNESSES
⦿ Creates a strong signal for SUP packaging reduction. ⦿ Promotes sustainable production and reduction of virgin plastic resin consumption for new packaging. ⦿ Creates demand for recycled raw materials in the market before requiring all plastic packaging to be recycled plastics. ⦿ Helps reduce GHG emissions by not using virgin feedstock.	⦿ Effective compliance requires a time-consuming proving process. ⦿ Could initially impact companies operating in the retail and consumer goods, chemicals, and packaging sectors, as well as industries using plastic packaging.
OPPORTUNITIES	**THREATS**
⦿ Some big global brand owners are starting to change their packaging towards the more sustainable ones ⦿ It will be more effective if implemented along with other measures to promote waste segregation and public awareness campaigns. ⦿ TISI has a draft industrial guideline on recycling traceability and assessment, expected to gather feedback from relevant stakeholders. If the guideline is eventually introduced, this measure is expected to help improve the compliance rate.	⦿ Not all plastic packaging producers in Thailand are registered; therefore, it is not easy to ensure all SUP packaging will meet the requirement. ⦿ Slow verification and approval processes may result in the use of other SUP materials, fake certifications (e.g., label), or continued use of non-recycled packaging. ⦿ The continued promotion of biodegradable SUP packaging by the government may offer a convenient solution for certain SUPs, such as bags, food trays/boxes, food wraps, thereby bypassing this measure.

Conditions

- Legislation is required to define (a) the point of charge, (b) applicable products and exemptions, (c) tax base, (d) tax rate, and (e) documentation and collection responsibilities
- The tax rate must be high enough to create a deterrent effect for non-recycled SUP and increase effort to achieve greater recycling shares.
- It must be complemented by measures that foster reuse (e.g., SUP packaging tax) and systematic recycling (e.g., waste separation and collection).
- Collected revenue from this measure should be earmarked for promoting effective waste separation and collection as well as recycling infrastructure.

- Ideally, the measure would not only consider whether a packaging item is recycled, but also the number of recycling loops provided the material quality and functionality will be maintained.
- Engage all relevant stakeholders (e.g., producers, recyclers, retailers, consumers) to gather their inputs/concerns before establishing a tax rate.

3.5 Tax Deduction for the Use of Biodegradable Plastics

Definition. Businesses that use biodegradable plastic products are entitled to a 125% tax deduction from their taxable income calculated based on the total purchase value. The purchase must be made with registered suppliers authorized by the state revenue agency. Only certain types of biodegradable plastics are eligible for this incentive. This measure is currently implemented in Thailand.

Objective. This measure promotes market demand for certain cash crops (e.g., cassava, corn, sugarcane) and incentivizes bioplastic producers to offer a more environmentally friendly SUP packaging to the market.

Figure 8. SWOT analysis of tax incentive on biodegradable single-use plastics

STRENGTHS	WEAKNESSES
⦿ Helps boost local demand for biodegradable SUPs in Thailand. ⦿ Supports farmers who grow raw materials (e.g., cassava, corn, sugarcane) and domestic producers of biodegradable products and resin. ⦿ Strong support from several plastic stakeholders in Thailand (e.g., Ministry of Finance, Ministry of Industry, biodegradable packaging producers).	⦿ Does not promote nor encourage the reduction of SUP packaging. ⦿ Degradability requires controlled temperature and moisture; disposed biodegradable SUPs may end up in landfills like normal SUPs. ⦿ Unlikely to lead to behavioral change and the reduction of wasteful SUP packaging in the long run. ⦿ Causes confusion with consumers against recyclable SUPs, resulting in the rejection of all SUP coffee cups (including PET) by local recyclers. ⦿ Currently not a popular incentive among target businesses due to the lengthy proofing processes.
OPPORTUNITIES	**THREATS**
⦿ Responds to the BCG strategy and Plastic Waste Management Action Plan (2020-2022). ⦿ Thailand is a leading producer of the raw materials needed for bioplastic synthesis and is well equipped with technology and technical expertise through all phases of the supply chain. ⦿ Abundant raw materials are available in the country. ⦿ Switching from a corporate tax deduction to a lower excise tax may create boosted demand by target companies, retailers.	⦿ Limited consumption of this alternative due to higher prices of biodegradable SUP packaging when compared with conventional SUP packaging. ⦿ Low adoption rates by target companies/retailers due to the lengthy verification process required before qualifying for a tax deduction.

Conditions

- If this measure continues to be promoted in Thailand, there must be proper systems and facilities for collecting and treating this type of SUP. Collection points must be convenient for the public.
- The public must also be made aware of its degradability conditions and not be confused with other recyclable SUP packaging (e.g., PET).

- Government support should be provided for treatment facilities of this type of packaging.

Other Considerations

- The general lack of understanding of the degradability conditions among agencies that promote this measure in the country will result in unintended consequences of this measure to the recycling process and the environment.
- A 'rethink' about the continued use of this incentive should be considered as it does not promote the circular economy. A better alternative would be to use it in the agricultural sector (e.g., nursery bags, soil bags).
- An evaluation should be performed on this incentive measure against its intended objectives before continuing it.

3.6 Consumers' Rebate Schemes

Definition. Consumers who refuse a SUP at the sales point will receive cash discounts or redeemable bonus points which can be turned into cash discounts or selected products.

Objective. This reward measure aims to dissuade consumers from using SUP packaging or buying SUP-packaged products and encourage the 'reduce', 'reuse', and 'recycle' mindset. It is widely implemented by supermarkets and convenience stores in Thailand.

Figure 9. SWOT analysis of the consumers' rebate schemes

STRENGTHS	WEAKNESSES
⦿ Helps raise public awareness about the SUP packaging problem. ⦿ Easily deployed or continued because it has been in use in Thailand by retailers for some time with notable success in increasing consumers' awareness of the plastic problem and the need for the 3R principle. ⦿ No change in law or regulations is required; purely voluntary. ⦿ Supports the Plastic Roadmap targets. ⦿ Receives good cooperation from the private sector.	⦿ The measure by itself will not lead to a significant or sustained reduction of SUP packaging if they are cheap to make and there are no further measures taken. ⦿ Unclear effectiveness in changing the consumer's behavior because many customers still do not bring their bags or baskets. ⦿ Conveniently applied to established retailers but not smaller shops and fresh markets (which consume about 2/3 of all SUP bags in Thailand).
OPPORTUNITIES	**THREATS**
⦿ Already implemented in Thailand through convenient stores and shopping malls. Consumers' familiarity with these schemes will make it easier to continue. ⦿ When implemented along with the SUP packaging levies, a strong impact can be expected. ⦿ Many retailers have shown interest to continue using this scheme.	⦿ Unhappy customers may prompt certain retailers/stores to bring back SUP bags for fear of losing their customers. ⦿ Uneven application of the measure among target retailers and stores would create competitive advantages between participating and non-participating stores/retailers, causing the measure to fail.

Conditions

- Implementation must be uniform and consistent across the retailers and shopping malls to prevent comparison and competition for customers
- An evaluation should be performed to obtain insights into its effectiveness in changing consumers' behavior.

- This scheme may be advanced to promote the use of reusable alternatives by placing a barcode/QR code on the alternative containers which will be scanned every time the same container/bag is used to encourage multiple uses.
- Incentives may be pooled across participating stores/shops (i.e., points can be used for any participating stores) to facilitate customers' convenience and enhance the scheme's attractiveness.
- Rewards may be broadened from cash discounts or selected items to other daily services (e.g., discount on utility fee, free internet airtime) and can be combined with other promotion campaigns from the participating stores to boost its attractiveness.

3.7 Deposit-Refund Schemes

Definition. A deposit is charged when a product with a certain packaging is purchased. The deposit is repaid when the empty (and clean) packaging is returned to a point-of-sale. There may be a one-way deposit (items collected for recycling) or a two-way deposit (refillable and reusable items e.g., glass, thicker plastic bottles).

Objective. This measure is designed to enable clean post-consumption SUP packaging, such as drink bottles, to return to the producers for recycling thus avoiding littering and reducing the use of virgin plastic resin.

Figure 10. SWOT analysis of the deposit-refund schemes

STRENGTHS	WEAKNESSES
⦿ Enables the empty SUP packaging to be retrieved for recycling. ⦿ Fosters the recycling and reuse mindset in the public, a fundamental step towards a circular economy. ⦿ Can be used with products where the empty packaging can cause environmental health to the public, such as fertilizer, pesticides.	⦿ May affect sales of products if the refund points are not conveniently located; customers may choose to buy other brands without the deposit. ⦿ May compete with the work of informal waste collectors who collect empty SUP packaging to send to the waste shops or recyclers. ⦿ The automated collection machines require extra investment (by the brand owners, producers). ⦿ May work better with bigger retailers, not smaller shops, as it requires space to collect used containers unless designed differently.
OPPORTUNITIES	**THREATS**
⦿ Several companies/brands in Thailand are starting to place the bottle refund machines in various locations, albeit still a handful. ⦿ Can be applied to optimize the EPR scheme. ⦿ Can change from 'cash refund' to 'bonus points' for use as a product discount or other incentives to attract the participation, such as discounts for electricity or water bills.	⦿ If the deposit is too low and the logistics for returning the empty packaging is too high, consumers may choose not to return them. ⦿ If the measure is not evenly applied across the sector and return points are not conveniently located, customers may choose to buy the same products with SUP packaging thereby putting the participating brands at a disadvantage.

Conditions

- This scheme will be most effective when applied, along with EPR, to plastic packaging with a low return rate and cause a particular littering problem.
- Should be supplemented by a well-set-up collection system (e.g., waste pickers, waste banks) to retrieve used packaging in case of low participation to prevent littering.

- For one-way recycling, ideally, closed-loop recycling should be applied. It may also be applied to the biodegradable SUP coffee cups to ensure proper disposal.
- Pooling systems for items with a deposit work well if a minimum mass and closed network in collection points can be established, facilitating convenience for the consumers. This may be at retail stores, markets, large buildings.
- May be applied as a 'Reuse as A Product' model for food delivery and takeaways.

3.8 Extended Producer Responsibility

Definition. A concept that acknowledges that producers of consumer goods bear some financial responsibility for the management of waste—collection, treatment, recycling, and disposal—resulting from their sales at the post-consumption stage. A pilot EPR program is being implemented in Chonburi Province, Thailand.

Objective. EPR provides a significant responsibility, financial and/or physical, to producers for the collection, treatment, recycling, and disposal of packaging at the post-consumer stage. It also provides incentives to prevent wastes at the source, promotes product eco-design, and supports the achievement of public recycling and materials management goals.

Figure 11. SWOT analysis of the extended producers' responsibility

STRENGTHS	WEAKNESSES
⦿ Provides incentives to prevent wastes at the source, promotes product's eco-design. ⦿ Support the achievement of public recycling and materials management goals. ⦿ Minimizes littering on land, marine, and coastal areas and helps extend the life of landfills. ⦿ Enables relatively clean recyclable packaging back into the system.	⦿ While big and global brands are committed to joining this scheme, the smaller and local brands are still struggling with their survival from the Covid-19 induced economic shocks; are not ready. ⦿ Free riders (i.e., producers not assuming their responsibility) may jeopardize the success; pro-active compliance controls will be needed. ⦿ An EPR law is needed to create a level playing field. However, environmental laws in the past have faced with many obstacles in the review and deliberation stages.
OPPORTUNITIES	**THREATS**
⦿ Existing waste banks and informal waste collectors/waste shops in Thailand can be good alliances for this measure to help retrieve the empty packaging ⦿ Many producers and brand owners are keen on this measure. It is also supported by academics ⦿ A voluntary 3-year pilot project between government (led by TIPMSE) and private sectors (global brands, packaging producers) has been launched in Chonburi Province. ⦿ PCD is planning to initiate an EPR law. ⦿ Can be used to support other measures e.g., deposit/refund scheme, incentives for recycling investment	⦿ Collection points are inconvenient, or procedures are cumbersome, causing consumers to give empty SUP packaging to the municipality dump trucks which then end up in landfills or incinerators. ⦿ If implemented without a specific law, the cost will be unevenly distributed among participating companies (e.g., big brands) causing the scheme to be unsustainable. ⦿ This will be worsened if incineration facilities e.g., waste-to-energy, RDF are promoted in the country without the educational/awareness campaigns about waste separation, 3Rs, and circular living principle or other measures to dissuade wasteful behaviors.

Conditions

- Effective implementation will require a legal framework to establish the scheme, describe the roles of different players, types of packaging applied, costs, documentation needs, and penalties for non-compliance, etc.
- Small and medium-sized producers must be engaged and included in the scheme.
- EPR costs must be regularly reviewed and updated to ensure the same level of outcome.
- The measure will benefit from other measures such as the deposit-refund scheme, waste banks.
- Existing players, including informal waste pickers, waste shops, waste banks, local governments, must be engaged and leveraged as they already play a crucial role in packaging waste collection.
- Clear and persistent communication is needed to kick start the scheme, encourage participation from the public, and maintain the momentum.

Other Considerations

- Experience from Europe and North America has shown that limiting the market to a monopoly non-profit PRO for the first 5-10 years facilitates the introduction of an EPR system, generating stable markets, standards, and procedures.
- If not carefully designed, an EPR may create a lock-in leading to thermal recovery rather than a meaningful reduction, reusability, and recyclability of packaging. To mitigate such a problem, the EPR fee may also factor in reusability and recyclability. Additional policies may also be needed to help promote 'reuse' and 'recycle'.
- In advocating for the legislation, there must be an inter-ministerial task force comprising representatives from key ministries (Environment & Natural Resources, Industry, Commerce, Interior), Council of State (the state's legal advisor), and private sector to prepare the draft and drive the process. This will help ensure any possible objections in further stages before the law would be passed.

3.9 Waste Banks

Definition. People collect tradable packaging waste (e.g., plastic, metal, cardboard, glass) and deposit it with the 'waste banks' or 'plastic banks' in exchange for daily food supply or cash. Collected plastics are reprocessed for reintroduction into the supply chain[29].

Objective. Waste banks or plastic banks help foster the waste segregation habit in the public by offering financial and/or social welfare incentives to the bank customers. It also enables the collection of the quality recyclable waste stream back into the production system, thus minimizing the consumption of virgin resin.

Figure 12. SWOT analysis of the waste bank schemes

STRENGTHS	WEAKNESSES
⦿ Helps address environmental problems and offers economic benefits at the same time. ⦿ Helps alleviate economic hardship for poor communities esp. in times of Covid19. ⦿ Easily deployed, no particular law required.	⦿ The measure by itself does not promote the prevention and reduction of SUP packaging. ⦿ Thrives on the abundance of SUP packaging waste, hence perpetuating the production of SUP packaging.

[29] The waste bank model was first introduced in Thailand in the late 1990s and has since been widely operated in many locations, especially in rural communities. Some models have adapted to use it as a cooperative where the proceeds from the sold waste for social welfares (e.g., funeral allowance).

⦿ Facilitates the collection of quality SUP packaging waste for the recycling process, thereby minimizing the reliance on virgin resin. ⦿ Promotes waste segregation mindset and habit in the public.	⦿ May compete with the work of the informal waste collectors. ⦿ Not effective when introduced in the big cities due to people's lifestyles.
OPPORTUNITIES	**THREATS**
⦿ Already been widely operated in Thailand with support from NGOs, companies (some are plastic producers), and local government. ⦿ Can be used to supplement/support other measures e.g., EPR, DRS, incentives for recycling investment. ⦿ May receive potential support from the local governments as the measure helps reduce the volume of valuable waste to landfills, hence cost savings for the local governments. ⦿ It may be adjusted to facilitate the production of packaging with recyclable content.	⦿ The banks are not conveniently accessible causing low participation and failures. ⦿ The incentives are not attractive enough for people to participate. ⦿ Lack of transparency and common rules for operations and management causes distrust and failure. ⦿ Waste segregation systems in the country are well set up and there are other attractive alternatives for people to drop off their SUP packaging waste e.g., collection/refund machines, convenient stores, etc.

Conditions

- A good set-up infrastructure and coordination with different stakeholders (e.g., a waste segregator, a recycler, and a waste recycling program/project) are needed.
- Clear and consistent communication must be provided to the waste bank's members and other community members to entice their participation.
- Transparency (esp. how the money will be managed, spent) must be ensured to create trust among their members.
- Close engagement between the waste banks and the Producer's Responsibility Organization (PRO) will benefit the EPR and DRS schemes through higher prices of recyclable waste and/or subsidies on low-value plastic waste.

Other Considerations

- This measure works better in the lower-income communities of the rural areas where waste collection by local governments is not well covered and access to the waste shops or informal waste collectors is also difficult. In such a context, a waste banks can help increase the environmental awareness of community members while also providing an economic opportunity for them through their participation.
- Waste banks in remote areas may benefit from an organized collection day by the waste shops or recyclers who go into different communities to collect the waste thereby lowering their transportation cost. Alternatively, communities located in proximity can also organize themselves to bring their collected waste in one truck to the waste shops (along with other scheduled errant).

3.10 Pay-As-You-Throw

Definition. Individuals, households, and communities are charged the collection of waste fees based on the waste amount they throw. Modeled around the polluter-pays-principle, PAYT treats waste management services like other utilities (e.g., electricity, water). Waste fees paid by users are modulated according to the amount of mixed waste delivered to the waste management system.

Objective. Based on the polluter-pays principle, this measure aims to create a disincentive for citizens over generating excessive waste without sorting before discarding it while also encouraging the reduce, reuse, recycling mindset on the citizens through the progressive waste collection price mechanism.

Figure 13. SWOT analysis of the pay-as-you-throw measure

STRENGTHS	WEAKNESSES
⦿ Creates fairness on waste management for citizens using the polluter-pays principle. ⦿ Stimulates waste separation at source and the 3Rs principle. ⦿ Helps achieve the country's circular economy, plastics management roadmap, climate change, and other related goals.	⦿ If fees are set too high, people may illegally dump their trash in other unregulated areas or burn it. ⦿ Requires strict enforcement to prevent free-riders (i.e., people who refuse to pay and illegally dump their garbage on others' property)[30]. ⦿ If implemented without a functional system for receiving separated garbage, it may lead to a high non-compliance rate and protests.
OPPORTUNITIES	**THREATS**
⦿ The Ministerial Regulation B.E.2559 (2016) authorizes local administrations to apply the collection and disposal fees based on the determined volumes[31]. However, it is being followed by a very small number of local governments. ⦿ The measure has been debated before and received fair support from certain NGOs and academics.	⦿ Lack of options for putting the separated waste may cause non-compliance and maybe protests as it could be viewed as adding a burden on the citizens in times of economic slump. ⦿ The current garbage collection/disposal fee structure revision plan is rejected by the Interior Ministry (which governs all local governments). ⦿ Reluctance by the local administrations to introduce the measure for fears of political setback.

Conditions

- A successful program requires a close engagement with concerned stakeholders (i.e., local authority, citizens, civil groups, collectors, recyclers, etc.)
- It typically works well if there is a flat rate minimum fee combined with a variable amount depending on the actual waste amount and possibly on the waste fraction/quality[32].
- It will also work well if implemented with a campaign to promote reduce, reuse, and recycle mindset among citizens, hence a good companion measure for EPR and DRS.
- Different design criteria may be needed for urban and rural areas based on types of housing, buildings, population density, etc.
- Simple systems with practical collection containers (e.g., bag, bin, basket), storage, and transportation are required to enable compliance.
- Enforcement and monitoring systems must be implemented to prevent/minimize free riders.

Other Considerations

- To implement this measure, it will require changing the ministerial regulation pertaining to fees setting for garbage collection and disposal as well as the political leadership from local administrations. To overcome this political barrier, this measure should be made mandatory for

[30] Effective law enforcement is a continuing challenge in Thailand.
[31] Volumes are divided into 20L/day (65 baht/month), 500L/day (3,250 baht/month), and 1,000L/day (3,250 baht/m^3). However, no local administrations have applied these revised rates. Each household still pays 40 baht/month (flat rate) while the actual collection/disposal costs are estimated at close to 150 baht/month per household.
[32] Michalscheck, M; Prakash, S. (2021)

all local administrations to comply with. Such order can be made from the ministry's level (e.g., Minister of Public Health).

- A joint working group of members from the ministries of public health, interior, finance, and natural resources and environment must be set up to discuss the rationale and merits of this measure before the suitable charging rates and procedures will be agreed/adopted.

3.11 Tax Incentives for the Use of Reusable Packaging and Packaging with Recycled Content

Definition. Product owners and service providers who use reusable packaging and/or packaging with recycled content will be entitled to tax incentives.

Objective. It promotes the 'reuse' and 'reduce' mindset of product packaging as well as the reduction of SUP packaging.

Figure 14. SWOT analysis of the tax incentives for the use of reusable packaging and packaging with recycled content

STRENGTHS	WEAKNESSES
⦿ Encourages the prevention and reduction of SUP packaging by the brand owners. ⦿ Stimulates an increased consumption of recycled packaging or non-SUP packaging. ⦿ Helps increase the competitiveness of recycled packaging producers in the mainstream market and supports the informal waste collection players in the country. ⦿ Helps achieve the country's circular economy, climate change, and other related goals.	⦿ It reduces tax revenue while revenue amount has declined substantially since 2020 due to reduced consumption, economic slowdown. ⦿ Registering and certifying the eligible products will be a daunting task for the responsible agency as there are locally produced/packaged products and imported products. ⦿ Will create resistance from brand owners if no alternative packaging materials (for certain products) are available at an affordable price. ⦿ May cause a potential rise of product prices at least initially.
OPPORTUNITIES	**THREATS**
⦿ May be applicable for the excise tax and corporate tax but not VAT as Thailand's treasury law prohibits the use of differing VAT rates to products. ⦿ A similar corporate tax deduction for the use of biodegradable plastic packaging creates precedence for this measure. ⦿ No new laws or regulations may be required but will need buy-in from the Ministry of Finance ⦿ Global demand for PCR content is influencing the mindset of domestic producers and global brand owners towards the increased use of packaging with recycled content.	⦿ No alternative packaging materials are available at an affordable price will make conventional SUP packaging prevail in the market with a higher product price. ⦿ The certification process for eligible products takes a long-time causing inconvenience for brand owners, leading to low participation ⦿ Consumers may not accept reusable packaging for certain products, such as food

Conditions

- Specific sectors and types of products must be agreed upon by relevant parties (e.g., PCD, TISI, Plastic Institute, TIPMSE) to establish the eligibility.
- The application and verification processes must be clear, streamlined, and relatively easy. There needs to be a verifying agency with the capacity to handle a large volume of applications.

- A target set for packaging with recycled content (e.g., 30% like in the UK) and a new industrial standard will be needed to make this measure more relevant.

Other Considerations

- Some European countries, such as the UK, are starting to require recycled content in plastic packaging. Big and global brand owners are already gearing towards compliance with the export markets. Having a target set for Thailand with an incentive measure like this one will help accelerate the compliance rate and create momentum by brand owners, albeit global ones initially.
- Given the low tax revenue collected over the last two years, the Ministry of Finance is not in favor of this measure. It must be noted that according to an interviewed officer from the Revenue Department, tax deductions may be offered to products and services but not to specific businesses, hence it may not be applicable for service providers. However, they may be eligible for a different set of tax privileges through Thailand's Board of Investment. While the application of this measure to product owners may be more relevant, more details need to be discussed about the type of products, verification, certification process. This measure needs to be further considered.

SECTION 4

Recommended Measures

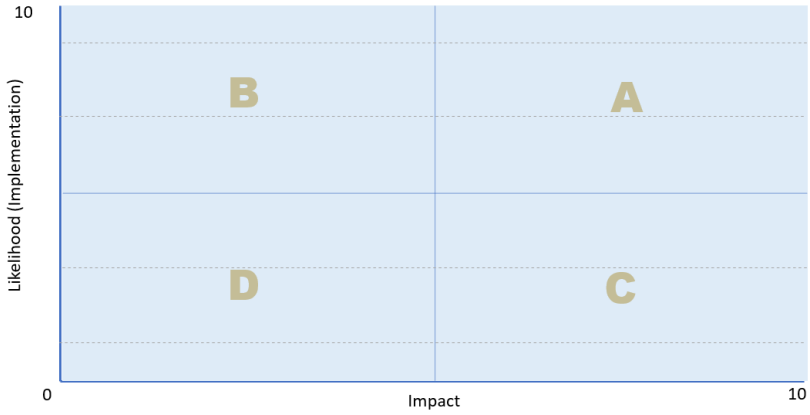
4.1 Measure Selection

A series of interviews were conducted with experts and relevant stakeholders from the government, private sector, academia, and select non-governmental organizations and social enterprises from late November 2021 through the first half of January 2022 (see the list of stakeholders in Annex I). A combination of methods was used—online interviews, in-person interviews, and online focus group meetings to obtain their views and insights on the prioritized measures. The interviewees were asked to review the longlisted measures and provide recommendations for the ones deemed appropriate to the Thai context. In some meetings, only specific questions relevant to the stakeholders' responsibilities or mandates were directed to the interviewees.

Their views on compiled measures were derived and their insights were collected to validate the initial review of the measures based on the literature review and to substantiate the SWOT analysis of each measure. Selected interviewees were asked to help prioritize the measures based on (their perceived) positive impacts from the measure[33] and the likelihood of implementation in Thailand. The interviewees were asked to score these criteria on a scale of 0 to 10 with **0 being No impact, No likelihood** of being implemented in Thailand (due to very high effort required), and **10 being Very high impact, Very high likelihood.** Accordingly, these two criteria are used to form a matrix with four quadrants or zones (see Figure 11).

Zone A is for the measures that have a medium-high perceived impact and medium-high likelihood (i.e., moderate-low effort), thus the prioritized zone. **Zone B** is for measures that have a low-medium impact but a medium-high likelihood of implementation. **Zone C** is the zone for medium-high impact measures, but low-medium likelihood (i.e., high-moderate effort) and **Zone D** is the zone for low-medium impact measures with low-medium likelihood, thus the least preferred zone due to its moderate-high effort and impact.

Figure 15. Measures prioritization using the impact and likelihood matrix



Using this matrix, measures that fall in Zone A should receive the highest attention as their impacts are relatively high to very high with a low to a moderate level of effort. Zone B deserves the second-highest attention due to moderate to high likelihood (moderate-low effort) although with the lower to moderate impacts. Accordingly, Zone C is the third-ranking zone (i.e., a moderate to high impact but with a

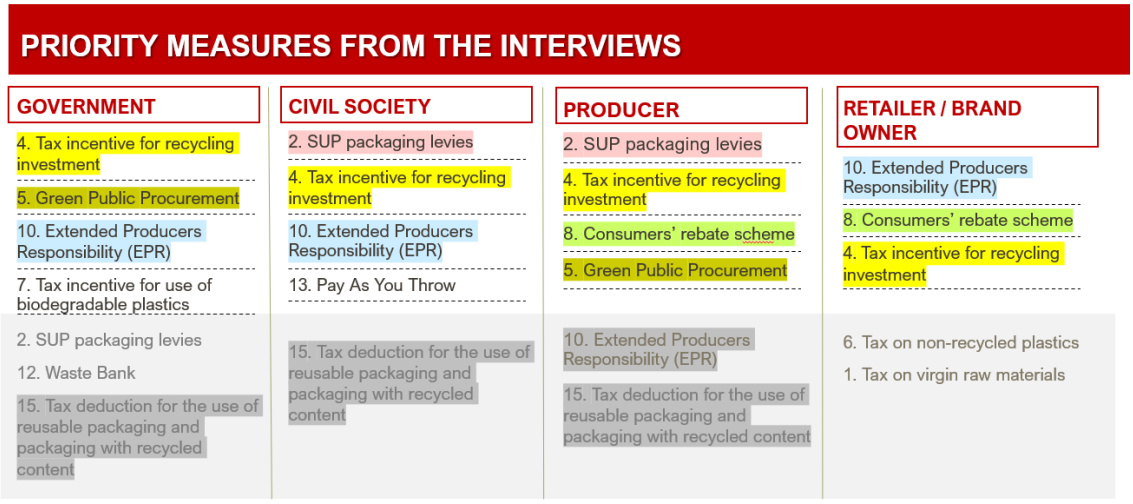
[33] Impacts are described in terms of the reduce, reuse, recycle, GHG emission reduction.

moderate-high effort to make it a success). And finally, measures that fall in Zone D are the least recommended measures. The results of this exercise provide a picture of common measures which emerged from the meetings and interviews with the four main sectors—government, civil society, producers, and brand owners/retailers[34].

According to the results, Measure 4 **(Tax incentive for recycling investment)** is ranked among the top four measures by all sector stakeholders, followed by Measure 10 **(Extended Producers Responsibility)** although the producers' group gave it a much lower score than Measure 5 **(Green Public Procurement)** but is still within the top 5 recommended measures. Measure 2 (Single-use plastic packaging levies) received the highest score from the civil society and the producers' groups, followed by the government group, albeit with a wide margin from Measure 4, the 4th ranking measure of the government group. Measure 8 (Consumers' rebate scheme) received strong support from the producers and retailer/brand owners' groups which also recommended this measure be continued. Similarly, Measure 5 (Green Public Procurement) is recommended by the government and producers' groups.

Measure 15 (Tax incentives for the use of reusable packaging and packaging with recycled content) receive limited scores from the government, civil society, and producers' groups but still falls in Zone A, therefore, it deserves attention as a priority measure.

Figure 16. Results from the prioritization exercise by sector stakeholders



4.2 Recommended Measures

To recap, measures that were most recommended by targeted interviewees are:

- Measure 4 – Tax incentive for recycling investment
- Measure 10 – Extended Producers' Responsibility (EPR)
- Measure 2 – Single-Use Plastic Packaging Levies
- Measure 5 – Green Public Procurement

[34] Government sector includes national agencies, local government, senator. Civil society include academic experts, social enterprises, NGOs, and international development partners.

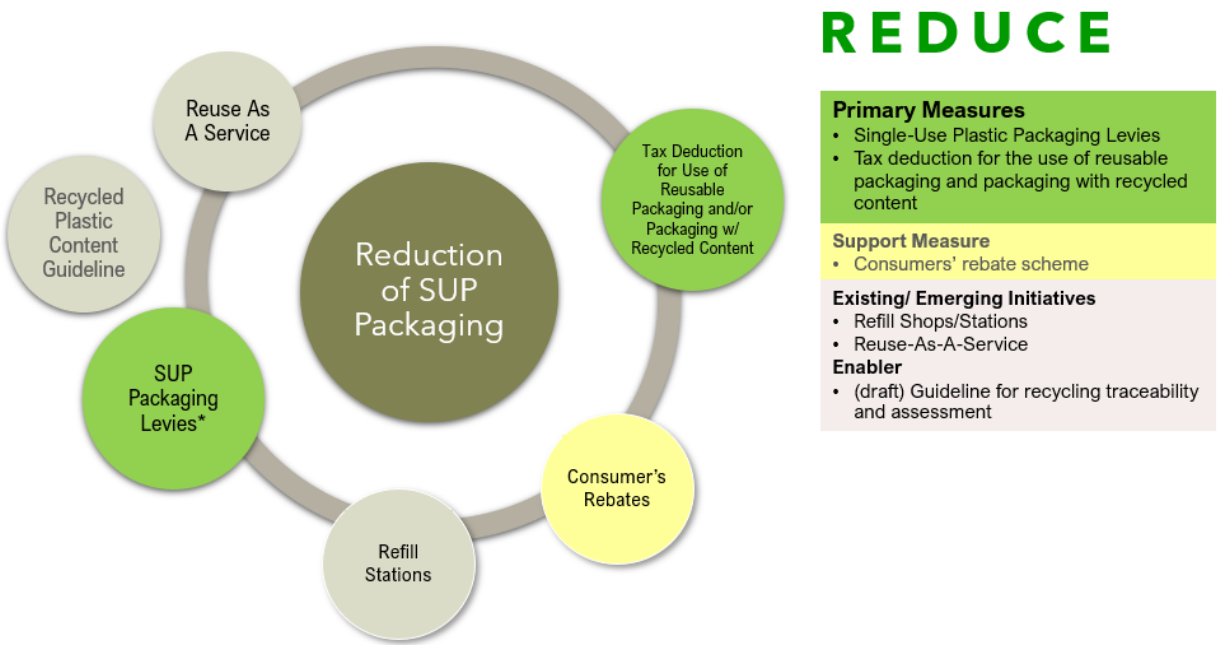
- Measure 8 – Consumers' rebate scheme
- Measure 15 – Tax incentives for the use of reusable packaging and packaging with recycled content

Additionally, Measure 12 (Waste Banks) is prioritized by the government group whereas Measure 6 (Tax for non-recycled plastic) and Measure 1 (Tax on virgin raw materials) are proposed by the retailer/brand owner groups as the priority measures. Measure 13 (Pay as you throw) is recommended by the civil society group (i.e., waste shop, waste collectors), plastic producer industry, and one stakeholder from the government group whereas Measure 7 (Tax incentive for biodegradable plastics) is supported by the government interviewees.

The priority measures proposed by interviewed stakeholders reveal a consistency with the initial shortlisting process undertaken and presented in Section 2, except for Measure 1 which is not previously shortlisted. These findings are consistent and confirmed during the in-depth interviews with select senior officials (e.g., Ministry of Finance, Ministry of Natural Resources and Environment, local government, Thailand Environment Institute).

The feasibility study's objective is to identify and explore the implementation feasibility of measures that will lead to (1) reduced consumption of single-use plastic packaging; (2) increased demand for reusable plastic packaging; and (3) increased market competitiveness of recycled plastic materials in Thailand. These objectives will be achieved not by a single measure but by a collection of measures, supplemented by the existing and emerging initiatives/efforts in Thailand. The diagrams that follow describe the relationships between these recommended measures and the above objectives.

Figure 17. Relationships between the reduction of single-use plastic packaging and prioritized measures



4.2.1 Reduction of single-use packaging consumption

Measures that will contribute directly to the reduction of SUP packaging consumption include Measure 2 (SUP Packaging Levies) and Measure 15 (Tax incentives for the use of reusable packaging and packaging with recycled content) whereas Measure 8 (Consumer's rebate scheme) will serve as a support measure[35]. However, there are some conditions as laid out in the SWOT analyses that must be considered (See Section 3).

A. Single-use plastic packaging levies

It must be noted there are some existing factors that play an important role in this measure's success and therefore should be leveraged.

First, about a dozen refill shops/stations are already operating in Thailand, mainly in Bangkok and Chiang Mai. These shops offer consumable products (e.g., shampoo, conditioner, dishwashing soap, body soap, cereals) by their weight and require customers to bring their own containers. Their existence will help promote the 3Rs principle and influence the consumers' mindset (especially the young generations) towards the circular economy. They should be supported through financial/fiscal and non-financial incentives to help them thrive.

Second, global brand owners of fast-moving consumer goods are leaning towards phasing out single-use plastic packaging and less use of the multi-layer flexible packaging to the more sustainable ones in line with global trends in green packaging. When coupled with a marketing campaign, their action will help raise public awareness on the over-consumption of single-use packaging thereby enabling efforts the single-use packaging levies measure is mounting to reduce SUP consumption in the long run.

Third, the Thai public is already familiar with the 'no-free-plastic-bag' policy being practiced by the supermarkets, convenience stores, and shopping malls. The practice is being extended to some smaller retailers and therefore creating a new norm for people to bring their own bags or pay for a carrier bag. However, to make it more effective, the bag charge must be set high enough to create an inconvenience to the customers.

These existing factors prepare the public for the introduction of a fee for a carrier bag and maybe also a ban/control of its distribution if it is to be adopted in the future.

Chula Zero Waste

The Chula Zero Waste program is a joint effort between Chulalongkorn University's Environmental Research Institute, Physical Resources Management Office, and the network of CU faculty and students to reduce the amount of waste on campus to zero. The program implements the 3Rs concept of reduce, reuse, and recycle. Moreover, it strives to eliminate the creation of waste in the first place and has implemented several strategies, such as reducing the use of plastic bags at various cooperating stores on and near the campus, charging a fee for single-use plastic bag at request, and encouraging all CU members to carry cloth bags or reuse bags. Since 2017, the program has reduced 41 tons of plastic bottles, 59 tons of plastic bags, and 5.4 tons of plastic coffee cups. It also turned 54 tons of low-value plastics into fuel briquette for cement factories and 80 tons of plastic cups to be used as the nursery bags.

[35] This is an existing measure practiced by supermarkets, convenience stores, and coffee shops (before Covid-19 pandemic)

B. Tax incentives for the use of reusable packaging

In-depth interviews with the Revenue Department and the Excise Department revealed that Thailand's VAT system is complicated, provides limited flexibility, thus trying to make a case for lowering or exempting a VAT is highly not recommended. This leaves the excise tax and corporate tax to be the only two choices if this measure were to be implemented. Thailand's Board of Investment provides tax incentive packages for target Thai and international companies to invest in strategic industries as well as both fiscal incentives and start-up capital for medium- and small enterprises to implement the country's BCG model through innovations.

To implement this measure, it is proposed a new category for circular economy promotion be created under the current BOI-supported industries. With the new category, select businesses and activities that aim to promote the 3Rs principle and meet the set conditions of BOI would be entitled to BOI's privileges (e.g., tax holidays, import duty exemption, seed grant, investment loans). Three types of businesses are proposed for this new category.

a) **Food Delivery and Takeaways -** The food sector is a good candidate for this new support package because it is the largest user of single-use plastic packaging in Thailand with a growing trend in food delivery and takeaways over the last two years. A new business called 'Reuse-As-A-Service' is being explored by the CAP SEA -Thailand project where a company provides reusable food containers for restaurants for delivery/takeaway service, and collect, cleans, as well as sanitizes used containers before returning them to the restaurants. This model will be trialed in Phuket later in late 2022.

b) **Fast-Moving Consumer Goods** – Following the initial success of the Loop[36] model in North America, the UK, France, Australia, and Japan, it is proposed this model be introduced in Thailand targeting the fast-moving consumer goods (e.g., soap, shampoo, detergent, food, and beverages). Loop products are sold in refillable packaging with a deposit included in the product price. After consumption, the consumers return the empty package to any participating retailers and get the deposit refunded. The package will then be returned to the manufacturers, sanitized, refilled with new content, and put back in the market again.

c) **Refill shops/stations -** Refill shops sell consumer goods (e.g., shampoo, liquid soap, detergent, cereal grains, etc.) by volume or weight. Customers must bring in their own containers to buy the products. There are over a dozen refill shops in operation in Thailand now, most of them are small businesses or social enterprises. Refill stations are vending machines that sell refillable water or other drinks without a single-use container. Customers need their own containers to receive the service from these refill stations. Currently, there are coin-operated water kiosks in Thailand that sell refillable drinking water by liter using the Reversed Osmosis technology. A similar machine may be made available to provide water in a smaller container's size. The same service may be offered inside the refill shops for customers' convenience. These businesses contribute directly to the circular economy's goal and are therefore recommended for the new circular economy tax incentive package.

[36] Loop is a global circular shopping platform that enables consumers to buy common household products in reusable containers and with a container delivery/return service in partnership with major retail brands. For more information, visit www.loopstore.com.

Moreover, to support businesses that offer reusable solutions, it is strongly recommended that TISI develops Design-for-Reuse standards for food ware, beverage container, and cups.

C. Tax incentives for the use of plastic packaging with recycled content

Under the newly proposed BOI's new circular economy promotion category, select tax incentives may be offered for brand owners and manufacturers of plastic packaging with recycled content. The privileges are suggested for certain plastic packaging made of PP, PET, HDPE, and LDPE—the top four resins by production volume in Thailand. This measure should be introduced along with the EPR program and the upcoming guideline for recycling content traceability for the plastic industry, as well as future requirements for recycled content in plastic packaging[37] to strengthen its efficacy.

Since the current draft guideline on recycling traceability and assessment serves as a mere technical guideline for compliance. Tax incentives as proposed will be beneficial to this requirement as it will offer an incentive for enhanced compliance by the plastic producers.

With the recent 3-year extension of tax deduction privilege for businesses that purchase biodegradable plastics, it may be fair to assume that biodegradable plastics consumption in Thailand would rise over the next three years thereby causing the price to be competitive with conventional plastics. This may render benefits to the Plastics Waste Management Roadmap (2018-2030) which aims to phase out four additional plastics by the end of 2022, including Styrofoam food boxes. But it also poses a danger for regrettable material substitution especially if the public is not aware of the degradability conditions of biodegradable plastics. To mitigate the problem, a series of public communication campaigns must be launched to inform citizens about these SUP's degradable conditions. Proper disposal and collection of empty biodegradable packages must be put in place as well as the investment in the facilities for treating the disposed packaging. For the latter, an additional BOI's support will be timely and most impactful if introduced through the above-mentioned tax support packages.

4.2.2 Increased demand for reusable packaging.

To increase the demand for reusable packaging, the deposit-refund scheme and the same tax incentives measure as discussed in the previous section and the SWOT analysis (See pages 39-40) are proposed.

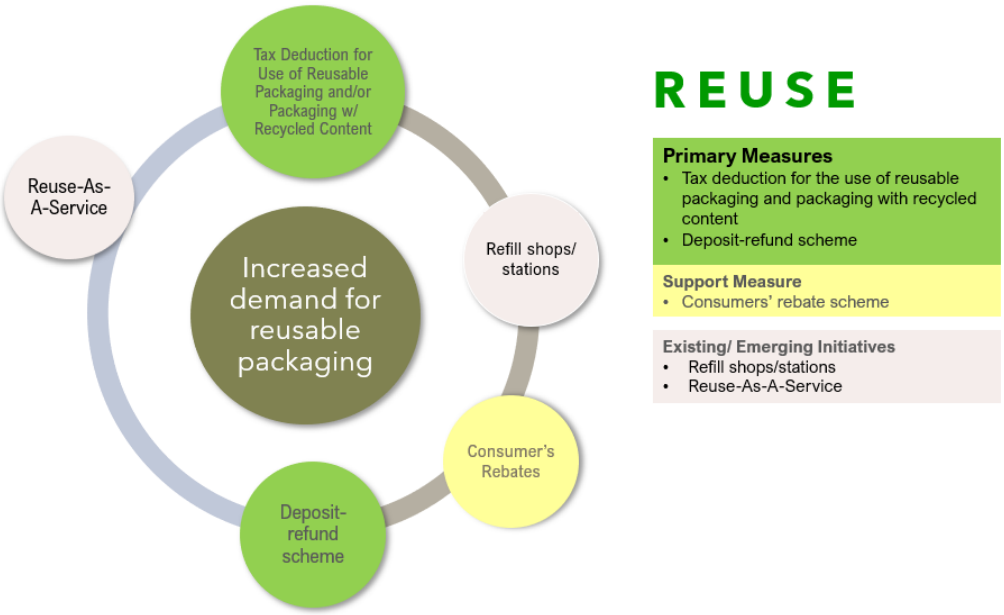
To enhance the measure's effectiveness, Measure 8 -- Consumers' rebate scheme, which is already implemented by coffee shops, leading retailers and convenience stores in the country, is suggested to be continued. The presence of existing refill stations is also expected to help boost the demand for reusable packaging.

A. Deposit-refund scheme

DRS programs are proven to be a success in many countries. Applying a DRS can potentially bring benefits to many starting initiatives in Thailand, such as the voluntary EPR program, reuse-as-a-service, loop model (5.2.1 B). For example, under an EPR program, a deposit-refund scheme may be applied for low-value single-use packaging which will likely end up in landfills, so they would be collected, treated, or recycled into other down-cycled products. Similarly, the scheme may be applied for the reusable food boxes (or *Pinto*) and reusable containers for consumable products, such as milk, yogurt, ice cream. Please refer to Section 4.2.1 B for details about tax incentives for reusable packaging.

[37] TISI is contemplating on a new industrial standard requirement for recycled content in plastic packaging following the launch of the voluntary recycling traceability and assessment guideline later this year.

Figure 18. Relationships between the increased demand for reusable packaging and prioritized measures



4.2.3 Increased recycling and demand for recycled products

In 2018, Thailand recycled about 17.6% of the key plastic resins—a significant shortfall from the National Plastic Waste Management Roadmap 2018-2030 target of 22% for the same year. About 2.8 million tons per year of plastics are disposed of (i.e., not recycled) and 87% of the material value of plastics is lost. This is translated to a plastic material value loss of USD 3.6-4.0 billion/year[38].

Food-grade recycled plastics command the highest margins across all the major grades of recycled products from PET, HDPE, LDPE, and PP resins. Major multinational companies have set targets for using up to 50% recycled resin in their packaging and demand for food-grade resins is growing in Thailand in PET, HDPE and is expected to grow soon in PP. However, only 3% of PET consumed in Thailand ends up in food-grade applications and that too is fully exported[39]. Moreover, recycled plastics in Thailand are always sold at a discount to virgin plastics[40].

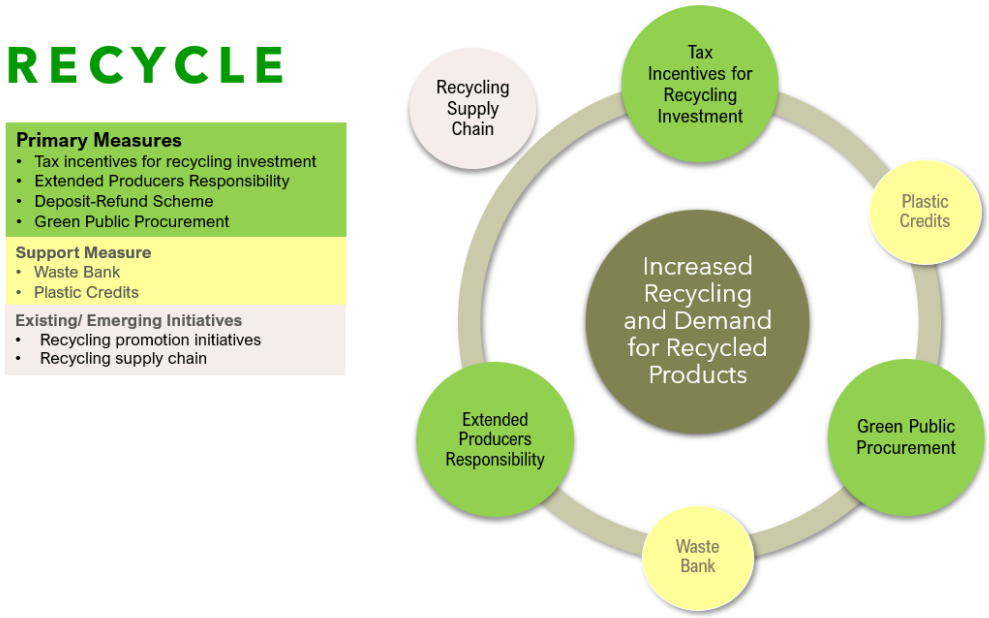
Several structural challenges cause a market failure for plastics recycling in Thailand and must be overcome. These challenges include a lack of Extended Producer Responsibility (EPR) framework for various industries that consume plastics, lack of local demand for recycled plastics, linear municipal waste systems that prioritize collection over recycling, and different sets of fiscal benefits and incentives for the recycling industry compared to the virgin plastics industry[41]. Other factors that exacerbate the market failure for plastics recycling include the full exposure of the recycling industry to oil and virgin plastic price drops, inability to capitalize on the growing demand for food-grade recycled products, import restrictions on high-quality, recyclable scrap plastics, and the lack of internalization of the costs of plastic waste mismanagement among plastic producers.

[38] World Bank, 2021
[39] ibid
[40] ibid
[41] ibid

The recycling industry and associated actors play a subordinate role in Thailand and are neglected by the government, compared to the plastic production industry which receives robust support through tax privileges for decades. Recyclers, waste shops, and waste collectors who play a crucial role in the recycling ecosystem make much fewer earnings and recognition by the state and society.

During the interviews and consultation meetings, several measures were raised and proposed as viable measures which could lead to increasing the country's recycling rate and demand for recycled products. These include Measure 4 – **Tax incentives for recycling investment**; Measure 5 – **Green public procurement**; and Measure 10 – **Extended Producer Responsibility**.

Figure 19. Relationships between prioritized measures vis-à-vis the increased recycling rate and demand for recycled products



A. Tax incentives for recycling investment

Currently, BOI offers exemptions of import duty for machinery, corporate tax, and other privileges, for industries of all sizes which invest in the recycling processes using modern technology. These privileges apply to manufacturers of recycled resin and recycled products but also mechanical and chemical recyclers. Similar incentives are also offered for businesses that engage in the development of software or platform for digital content or services (e.g., online apps). Start-up companies that connect different players in the recycling supply chain may be qualified for these incentives subject to required conditions. While the above incentives are on the right track, there are some suggestions for BOI to make further entice the interest from the recycling industry:

- Extend the tax exemption for plastics recyclers from 3 years to at least 5 years to bring them in line with incentives for virgin plastics manufacturers.
- Increase tax exemption for plastics recyclers to up to 8 years.
- Extend the privileges for growing mechanical recycling capacities for PP, HDPE, and LDPE/LLDPE.

- Require all recipients of BOI incentives to have necessary environmental, health and safety practices and standards in place such as wastewater treatment, and
- Expand the scope of incentives to also include incentives for the material washing process, an important but expensive process in recycling to extract the most value from collected waste[42].
- Broaden the current coverage to include Material Recovery Facilities (MRF) as they improve productivity and quality by integrating technologies such as optical sorting systems.

Furthermore, privileges shall also be used to promote packaging that fulfills Design-for-Recycling standards developed by TISI.

B. Extended producer responsibility (EPR)

An EPR program is expected to improve the collection system of target plastic packaging waste and to address the shortfall caused by inefficient municipal collection systems. Fortunately, a pilot voluntary EPR program will soon be launched in Chonburi Province. Led by Thailand's Institute of Packaging Management for Sustainable Environment (TIPMSE), under the Federation of Thai Industries, and joined by 50 organizations including leading consumer brands and packaging companies, the 'PackBack' Project is scheduled to be implemented in Saen Suk, Ban Bueng, and Koh Si Chang municipalities and implemented through 2023.

Five packaging types are targeted—glass, cardboard, plastic bottles (PET, HDPE), aluminum cans, and metal containers. Low-value packaging such as multi-layer flexibles and paper cartons will also be covered for proper disposal and/or downcycling process. Participating companies currently contribute their resources, both in-kind and in-cash, for the program as suitable EPR fees are yet to be determined. The baseline data collection is in progress to understand the waste volumes and set the targets for monitoring the performance. Conditions and other considerations for a successful EPR scheme can be found in the SWOT analysis section (see pages 35-26). Existing programs like the waste banks and plastic credit scheme are expected to contribute to the successful implementation of the EPR program; therefore, they should be leveraged.

C. Green public procurement

Finally, **green public procurement** is prioritized as another measure to help boost the demand for recycled products in the country. Although this is not a new concept in Thailand as it is already embedded in the government procurement process for some time; however, the lack of qualified suppliers in the market and the higher prices of green products as well as the weak conditions for compliance have all made green public procurement a secondary option for the public procurement process. Evidently, green packaging is one of the 39 categories of the list of green supplies and services under the government's green public procurement policy. However, no vendors/suppliers have yet been registered on the vendors list.

Several requirements are already made in the current green public procurement for paper and plastic packaging. For example, both paper and plastic packaging suppliers must receive the 'green label' for respective packaging materials (i.e., TGL-104 for paper and TGL-105 for plastics). The production, transportation, and disposal process must be done according to the government's requirements, or the factories must be ISO14001 certified (or the Thai equivalent). Paper packaging must be made from

[42] World Bank, 2021

recycled paper or agricultural waste (ranging from 20% to 80%), depending on the types of packaging. Hard plastic packaging must contain at least 30% recycled plastic content, or at least 40% production waste, or at least 35% recycled plastic content and production waste combined. Soft plastics and films must contain between 20-30% recycled content and/or production waste depending on the packaging types. The requirements also cover the types of inks used on the packaging and no additives must be used in the production.

As noted in the SWOT analysis for the green public procurement measure, this measure cannot be successfully taken unless there is an optimal size of qualified suppliers for these products thereby making their prices competitive with conventional products and the requirements be made mandatory for all public procurements. In addition, the types of plastic products under the green public procurement should be broadened beyond office supplies and packaging to cover office furniture and IT equipment as in the EU's Green Public Procurement Manual on Plastic Waste Prevention. Requirements should also cover events organizing.

Driven by the increasing global environmental consciousness, many existing initiatives run by NGOs, companies, and universities, are fostering a shift of people's mindset towards a circular living in Thailand (see Annex II). In addition, there already exists an established recycling ecosystem (e.g., recyclers, processors, waste shops, waste collectors) in the country but will need more support and coordination among the actors. This is perhaps the most practiced principle of the 3Rs principles in Thailand and provides great leverage to achieve a circular economy.

D. Additional measures

The **Pay-As-You-Throw** measure, although supported by some stakeholders from the government sector, plastic producers, and civil society groups, is considered to be a 'low likelihood' measure by most interviewed stakeholders. Their convergent views point to the lack of political leadership by local administrations to increase the current household garbage collection fee of 40 baht a month despite the revised ministerial regulation empowering them to apply different charges based on the volume of waste generated per day. Only a few small local administrations have implemented the revised fees together with the waste separation and recycling programs. Their experiences should be studied for other local administrations to learn as most are struggling with their budget and technical capacity constraints, not just the fears of political setbacks.

It must also be noted Thailand has seen a steadily rising number of waste incinerators, waste-to-energy, and refuse-derived facilities over the last 5-6 years. The rise is driven mainly by the government's support and their effectiveness in ridding of solid waste while also yielding other co-benefits such as electricity surplus to the grids and communities or RDFs for the cement kilns. Some interviewed stakeholders support this solution as a quick and efficient means to tackle the gigantic amount of untreated solid waste in the country[43]. Although not an ideal measure for a circular economy, it is deemed a necessary measure in the interim while other measures are being promoted with the hope the country will come to the point where circularity concept is taking hold in Thai society.

[43] About 4.25 million tons (16.7% of total generated waste) of solid waste was left untreated in Thailand (PCD, 2021).

4.3 Measures Not Promoted

Some measures either received limited scores or are not prioritized by interviewed stakeholders although they were previously shortlisted in the initial assessment (Section 2). These include Measure 6 (Tax on non-recycled plastics), Measure 7 (Tax incentive for the use of biodegradable single-use plastics), and Measure 9 (Deposit-refund scheme). Certain interviewed stakeholders suggested turning Measure 6 (Tax on non-recycled plastics) into an incentive measure for producers and brand owners who comply with the new industrial guideline for recycled content in plastic packaging[44]. This is presented in section 4.2.3 above.

The Thai Cabinet recently approved a 3-year extension of the corporate tax deduction for businesses that purchase biodegradable plastics to continue boosting domestic demand for the products. While this may be good news for the local biodegradable plastic producers, some plastic industry experts are less optimistic about the positive prospect saying the privilege is not attractive enough to stimulate an increased demand while the prices of biodegradable plastics are still higher than convention plastics. It is yet to be certain whether biodegradable plastics demand would increase over the period as expected.

Biodegradable/compostable plastics may be suitable for certain applications, such as household organic waste and agricultural purposes. However, a lack of proper post-consumption systems could make these packaging no different from petroleum-based plastics or could be worse since biodegradable plastics cannot be recycled and may be mixed with recyclable plastics in the collection systems. Some interviewed stakeholders suggested certain conditions be set for the continued use of these packaging, such as launching the public awareness campaign on its degradability, ensuring proper collection and disposal systems. A deposit-refund system may be useful for biodegradable coffee cups, and finally, it should be strictly used for selected applications, such as agricultural purposes, and specified clearly in the next phase of the Plastic Roadmap Action Plan.

Similarly, waste banks are already operating across Thailand. In many locations, they are proven to be a good program that drives recycling habits while also providing an economic incentive for participants. Their operations may help the EPR program if some conditions and considerations (as presented in the SWOT analysis section) are adhered to.

[44] A draft technical guideline is shared with relevant stakeholders for comments

SECTION 5

Way Forward

5.1 Single-use plastic packaging levies

Several building blocks already exist in Thailand and must be capitalized to implement this measure. As discussed in Section 4, leading supermarkets, retail/convenience stores, coffee shops, and shopping malls responded favorably to the government's policy to phase out single-use plastic carrier bags at their premises and introduced a fee system for customers who need one. The same policy is also implemented on campuses. During the pre-Covid-19 pandemic period, some coffee shops also offered cash discounts for customers who brought their cups or tumblers[45].

Moreover, a discussion between plastic producers and government is ongoing about requiring thicker and more durable plastic bag specifications to discourage free giveaways and single-use habits. A behavioral study of Thai youths[46] shows the changing perception regarding plastic pollution in Thailand and that youths are more willing to accept the imposition of a plastic ban as they perceive the negative impacts of plastic bags and hence end up using reusable plastic and non-plastic bags. All these elements provide a good basis for the imposition of a fee for SUP bags, building on the momentum created must be carried by private sector-led initiatives to date. Nonetheless, some steps are suggested to further the action.

- **Identify** an initiating body to lead the process of starting and implementing this measure by winning support from all relevant stakeholders. A working group under the plastic and hazardous waste management sub-committee may be the suitable body for this role.
- **Revitalize** the national 'Every day, Say No to Plastic Bags' campaign to remind the public about the consequences of SUP carrier bags consumption and boost the recycling mindset and increase the use of reusable containers.
- **Expand** the campaign to other premises (e.g., shops inside all commercial and government buildings, campuses), smaller shops, and fresh markets.
- **Implement** the ban on SUP carrier bags outside of the first-taker groups to include smaller mom-and-pop shops and traditional markets. An incentive scheme may be offered to entice both vendors and customers to comply. It should be made compulsory that no free bags will be given, and customers must pay for a carrier bag (regardless of material and size) if they need one. Markets with good compliance rates will be given an award from respective municipalities. Small shop owners are encouraged to charge a bag fee for which can be kept by themselves.
- **Foster** close coordination and consultations among relevant agencies and private sector groups (i.e., Ministry of Industry, Ministry of Finance, Ministry of Commerce, Ministry of Natural Resources and Environment, Federation of Thai Industries, Thailand's Plastics Club, Institute of Packaging Management for Sustainable Environment, Thai Chamber of Commerce) to agree upon the target types of plastic packaging[47] and conditions to be followed. Deeper discussions will be needed with the smaller producers, FTI, and relevant agencies. Conditions and other considerations as laid out in the SWOT analysis of this measure must also be reviewed. Technical input from academia and supporting organizations should be sought.
- **Organize** a series of public outreach campaigns prior to the launch of the measure to alert the public about the upcoming policy.

Following feedback from the plastic producing industry, tax revenue collected at the production stage will likely be passed on to the consumers. But there is no guarantee the revenue would be used for promoting the recycling or reuse activities to create a circular economy. Given the fact the State Fiscal and Financial

[45] The policy is temporarily halted due to Covid-19 contamination concerns.
[46] Vassanadumrongdee, S., Hoontrakool, D., Marks, D. (15 May 2020)
[47] May start initially with the food sector as it contains the highest volume of SUP packaging

Disciplines Act, B.E. 2561 (A.D.2018) does not allow earmarking tax revenues for specific agencies or purposes, the only option left is to transfer the revenues to a special purpose fund similar to how the current Fuel Oil Fund is set up and administered. However, this is not a simple process, and new legislation will be needed—a process by which strong political leadership from the initiating ministry and tactful negotiations will be required. To bypass this process, one of the existing funds may be used to receive the transferred revenues. Negotiations with the respective fund managers will be necessary.

5.2 Tax incentives for recycling investment

This measure is expected to advance existing BOI's privileges provided for the recycling industry as detailed in Section 4. Based on the framework of the Investment Promotion Act, some strategic steps are suggested to be undertaken.

- **Socialize** the proposed extension of current BOI's privileges with the working group on plastic and hazardous electronic waste and to obtain support from the working group.
- **Seek** interest and support from plastic recyclers, recycled plastic producers, and waste segregators about the proposed line of support and additional type of businesses to benefit from the new support package (see details on page 28-29). Their views and concerns will be important to adjust/pursue the proposed support to BOI.
- **Propose** the measure and extended line of support with the BCG Steering Committee and seek a buy-in from it.
- **Engage** a political leadership from the Ministry of Natural Resources and Environment (e.g., the minister, permanent secretary) to lead the discussion with BOI's secretary-general.
- **Enter** a discussion with BOI's secretary-general and secure the commitment.

5.3 Tax incentives for packaging with recycled content

This measure should be implemented in tandem with the planned introduction of TISI's new guidelines on recycled content in plastic packaging requirements. To implement this measure, several steps are suggested.

- **Bring** the measure to the attention and **obtain** political support from the BCG Steering Committee.
- **Set up** a multi-stakeholders working group comprising inter-ministerial agencies, civil society groups, and private sectors to agree on the requirements, compliance, and conditions. Technical representatives from the BOI, ministry of industry, ministry of natural resources and environment, and ministry of finance as well as the plastic producing industry must be the members of this working group.
- **Allow** the use of recycled plastics in food-contact applications as they command the highest margins across all major grades of recycled products from PET, HDPE, LDPE, and PP while Thailand's consumption of rPET is only at 3%.
- **Set** the recycled content targets and standards to be the benchmark against which the country's recycling rate can be measured. It is also to promote acceptance of recycled products as consumers feel confident about product performance and safety.
- **Develop and launch** incentives for using the packaging with set recycled content through the BOI's support package (as proposed in Section 4).
- **Advocate and negotiate** with the Comptroller-General Office (Ministry of Finance) to mandate green public procurement of recycled plastic products.
- **Organize** public consultation workshops to gather feedback from relevant stakeholders.

- **Identify and assign** a technical agency to verify/certify the recycled plastic content. The verification/certification process must be straightforward to entice compliance and the agency must be capable of handling a large volume of applications.
- **Devise** a communication strategy and launch the measure.

5.4 Tax incentives for the Use of Reusable Packaging

As mentioned in Section 4, this measure should initially target the food delivery and takeaways services because of their sizeable market share in SUP consumption. The CAP SEA project has received good feedback and interest from several restaurants in Phuket to join the Reuse-As-a-Service model. Discussions are underway between the project and a local start-up company (Kid-Kid) to come up with a viable business plan for capital mobilization. Building on this groundwork, some suggestions are provided to help this measure become a success.

- **Develop and explore** appropriate incentives for businesses that employ the reusable packaging model through the BOI's support package (as proposed in Section 4), by targeting initially the food delivery/takeaways sector and select FMCGs.
- **Explore** alternative reusable packaging/containers for different types of products and innovations to ensure content quality. For example, 'pintos' are commonly used in Thailand as a traditional food container. Added with a good design and heat-containing technology to keep the food warm, they may be an appropriate choice for food delivery. However, a container's deposit may be required.
- **Explore** the possibility of introducing the Loop model in supermarkets or refill shops. This may involve initiating a separate discussion with another start-up company or with an existing refill shop for their interest.
- **Identify** additional funding sources for the start-up to implement the business plan.
- **Bring** the measure to the attention and **obtain** political support from the BCG Steering Committee.
- **Design and launch** a pilot project (possibly in Phuket where the idea is being discussed). Experiences from the CAP SEA project in Malaysia and Indonesia where a similar model is being experimented must be examined and learned.
- **Engage** a political leadership from the Ministry of Natural Resources and Environment (e.g., the minister, permanent secretary) to lead the discussion with BOI's secretary-general.
- **Monitor** the progress and performance of the pilot for further revision and/or scale-up elsewhere in Thailand.

5.5 Extended Producer Responsibility

Recognizing the good effort being led by TIPMSE and 50 business partners to introduce a voluntary EPR program in Chonburi and ongoing efforts by PCD and others to introduce an EPR legislation, additional steps below are suggested to help further the efforts towards a successful implementation.

- **Promote** the voluntary EPR program within the PPP Plastics stakeholders and the Working Group on Plastic and Hazardous Electronic Waste to gain heightened attention and support. It is found the pilot project is getting too little attention from relevant players (e.g., FTI, agencies, companies) despite a formal MOU signing ceremony with 50 participating organizations.
- **Provide** technical support for TIPMSE (the lead agency of the pilot program) and relevant stakeholders to learn lessons from other countries (e.g., EU) to inform the design of Thailand's full-fledged EPR program.

- **Offer** dedicated technical consultancy support (i.e., an experienced expert from a country where EPR is successfully implemented) to provide advisory services during the setup of the voluntary EPR and design of the full-fledged program later on.
- **Advocate** for the EPR program as one of the interventions to be supported by the national working group on circular economy.
- **Convene** a forum and technical workshops to bring together all concerned players in an EPR program—government agencies, producers, brand owners, retailers, consumer groups, waste aggregator, waste collectors)—to present ideas, exchange views, concerns, and chart out a national plan/roadmap for an EPR program.
- **Create** financial incentives for eco-design, circular economy business model, waste reduction, and map out a timeline for implementation.

Most importantly, small and medium-sized producers must be engaged and included in the scheme. Existing players, including informal waste pickers, waste shops, waste banks, local governments, must be leveraged as they already play a crucial role in packaging waste collection.

5.6 Green Public Procurement

As mentioned in Section 4, Thailand's green public procurement policy has been in place since 2008, and plastic/paper packaging is one of the 39 categories of goods and services introduced into the policy last year. The followings are suggestions to help GPP implementation more rigorous and effective, especially for the plastic & paper packaging sector.

- **Support** development of a communication plan for pitching support from high-level decision-makers (i.e., minister of environment and minister of finance) toward rigorous implementation of the GPP. The plan should clearly align the benefits of GPP (in terms of cost and energy savings) against the country's Nationally Determined Contribution (NDC) and towards the net-zero targets (2050 for CO2 and 2065 for GHGs).
- **Identify support from** a political champion (e.g., senior-level leadership) to help propagate GPP for the packaging sector and make it a preferred procurement criterion, similar to how the 'Made in Thailand' brands are promoted.
- **Design** the incentives for procuring agencies that include green packaging as one of its procurement criteria.
- **Continue** to work with like-minded partners to make GPP a mandatory policy in Thailand.
- With the blessing from the BCG Steering Committee, **enter** a high-level discussion with the Ministry of Finance (esp. the Comptroller-General Office) to obtain a green light for pushing this measure forward under Thailand's current GPP policy.

In addition, resources from GIZ's project on green public procurement must be leveraged and lessons be learned to construct a pathway for promoting an effective green public procurement program in Thailand.

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Annexes

Annex I – List of stakeholder engagement

Organization	Name & Position
The Prime Minister's Office	
Board of Investment	Ms. Duangjai Asawachintachit, Secretary-General Mr. Chanin Khaochan, deputy Secretary-General
The National Assembly of Thailand	
Senate Committee on Natural Resources and Environment	Mr. Weerasak Kowsurat, Vice Chairman
Ministry of Natural Resources and Environment	
Pollution Control Department	Ms. Sunanta Phontawong, Environmental Specialist
Department of Marine and Coastal Resources	Ms. Sumana Kajonwattanakul, Director of Marine and Coastal Resources Research and Development
Department of Environmental Quality Promotion	Ms. Thongbai Wetchapan, Director of Development of Environmental Quality Promotion Division
Office of the Permanent Secretary	Mr. Suwan Nanthasarut, Advisor, Permanent Secretary Office
Ministry of Industry	
Office of Industrial Economics	Mr. Boworn Kitiphaisalnon, Plan and Policy Specialist
Thai Industrial Standards Institute	Ms. Utumporn Kaewnamdee, Laboratory Accreditation Group & Team
Ministry of Higher Education, Science Research, and Innovation	
Office of National Higher Education Science Research and Innovation Policy Council	Ms. Saravanee Singtong (PhD.), Senior Policy Specialist
Thailand National Metal and Materials Technology Center (MTEC)	Ms. Tipawan Tangjitpiboon, Senior Analyst
Ministry of Finance	
Fiscal Policy Office	Mr. Warotai Kosolpisitkul (PhD.), Fiscal Policy Advisor Mr. Khanchit Kunakorn, Director, Fiscal Innovations Division
Excise Department	Mr. Lavaron Saengsanit, Director General
Department of Revenue	Ms. Pimorn Yimprasert, Team Leader, Tax Policy Team Ms. Pawanee Bumrungsri, Tax Revenue Specialist
Local Administrations	
Rayong City Municipality	Mr. Chatnuchai Sombatsri, Municipal Clerk
Mab Taput Municipality	Ms. Kanchana Teliyachote, Director of Public Health and Environment
Phuket City Municipality	Mr. Saroj Angkhanapilas, City Mayor
Private Sector	
Thailand Institute of Packaging and Recycling Management for Sustainable Environment (TIPMSE)	Ms. Kavena Sriviroj, Specialist, Academic Administration and Training Department and Public Relations Department.
Plastics Institute, Federation of Thai Industries	Mr. Veera Kwanloetchit, Director
Plastic Industry Club, Federation of Thai Industries	Mr. Viraj Klewpatinond, Chairman Mr. Thitithum Pongpanangam, Vice Chairman
Thai Business Council on Sustainable Development	Mr. Wijarn Simachaya (PhD), Secretariat
Nestle Thailand	Mr. Plangsit Suttapreeyasri, Government Affairs Manager

P&G Thailand	Mr. Nutcha Tamjaijitr, External Relations Senior Manager
PTT Global Chemicals Plc.	Ms. Kasina Samdaengdech, Business Development Manager, NatureWorks Asia Pacific, PTT Global Chemical Plc. & Team
CP All	Mr. Kornwut Poopong, General Manager, Food Supply Center & Team
Itochu Ltd.	Ms. Maneekaew Chuenkamolkul
Academics	
Asian Institute of Technology	Mr. Thamarat Koottatep (PhD), Professor/Academic Chair of Marine Plastics Abatement Program
Mae Fah Luang University	Mr. Panate Manomailvibool (PhD), Researcher/Assistant to the President
Chulalongkorn University	Ms. Sujitra Vassanadumrongdee (PhD), Senior Researcher at the Environmental Research Institute and Team
Civil Society Organizations/ Social Enterprises	
IUCN	Ms. Maeve Nightingale, Senior Program Officer, Coastal and Marine Science and Strategy Group (SSG) Ms. Siriporn Sriaram, Senior Program Officer, Marine & Coastal Mr. Supranee Kampongsan, Head of Program Office
WWF	Ms. Juliet Ler Hui-Ling, Senior Manager for the Plastics Program & Team
Thailand Environment Institute	Mr. Wijarn Simachaya (Ph.D), President
GEPP	Ms. Mayuree Aroonwaranon, CEO & Co-Founder
Wongpanit	Ms. Wimonrat Santadwattana, International Relations Coordinator
Lessplasticable	Ms. Lynratch Natpawong, Founder & CEO
Waste Collectors and Waste Shops Association	Mr. Amarin Chantra
2nd Life Thailand	Mr. Nik Supatravanij, Program Manager

Annex II – Existing initiatives in the country

There are several private sector-led initiatives/projects developed to promote the circularity of SUP packaging by creating an ecosystem to collect SUP and other single-use products back to the manufacturing stream.

(1) **Won project** (Won means 'circulate' in Thai): Initiated in April 2019, Won Project sets up drop points to collect 12 types of flexible plastic bags and film (PE). During April 2019 and March 2021, the Won project collected 186 tons of flexible plastics back to be recycled from their 350 drop points.

(2) **Magic hand x Won project**: Initiated in 2020 by PPP-Plastics in collaboration with Won project, this project sets up about 200 drop points for 12 types of flexible plastic bags and film (PE) (Figure 4). Approximately 14.5 tons of plastics were collected between June 2020 and Feb 2021.

(3) **Transform plastics to merit project**: Initiated in 2020, this project sets up 20 drop points in the government buildings to collect flexible plastic packaging and hard plastics (food containers, cups, straws, utensils, and bottles). From June 2020 to Feb 2021, 1.4 tons of flexible plastics and 1.7 tons of hard plastics were collected.

(4) **Send plastics home project**: The project was implemented from May to October 2020 aiming to collect flexible and hard plastics from 31 drop points accounting for 4.9 tons of plastic waste.

(5) **Green roof project /BECARE**: Initiated in 2018, the project installed 150 drop points for milk cartons in the Big C supermarket and 220 additional drop-off points in 14 provinces. 500 tons/year of cartons were collected from Big C markets and 700 tons/year were collected from 14 provinces.

(6) **Magic box project**: Initiated in 1982, the project collected 10 tons/year of drink cartons from 30 drop points.

(7) **Disassemble, clean, and collect project**: Initiated 2020, the project collected about 1.4 tons/year of drink cartons.

Figure 20 - A campaign leaflet promoting the WON project