



The
Incubation
Network



2021 Market Insights Report

Rethinking Plastic Waste in Thailand



About

The Incubation Network

Launched in 2019, The Incubation Network is an impact-driven initiative that sources, supports and scales holistic innovative solutions to combat plastic pollution by working with a diverse network of key partners to strengthen entrepreneurial ecosystems across South and Southeast Asia.

Programs such as the 2020 Circular Innovation Jam have enabled The Incubation Network to build connections with local startups and growing businesses that focus on plastic circularity. Through research conducted by NGOs working in Thailand, such as the Stockholm Environment Institute (SEI) and the International Union for the Conservation of Nature (IUCN), we are also understanding more about specific needs and opportunity areas where incubation and insights can play a role alongside the necessary commitments of public and private leadership and investment.

Current Conditions in Thailand

Thailand is ranked sixth out of the top 10 sources of ocean plastic, contributing an estimated 322,000 tonnes of the 8 to 12 million tonnes of plastics entering the oceans each year¹. The country's focus has traditionally been on solid waste collection and has achieved a relatively high waste collection rate of an average of 70% across the country. However, a lack of focus on integrated solid waste management principles, including recycling and circularity, have resulted in mismanagement, with much of the country's waste incinerated, dumped in unsanitary landfills, or leaked into the environment as a result of the close proximity of the country's population to major waterways. The packaging sector contributes almost 60% of total plastic leakage, reflecting the industry's place as one of the five biggest consumers of plastic, and that plastics used in packaging typically have a shorter lifespan than other applications.

Plastics recycling faces many constraints, which results in low rates of source segregation. Challenges include a lack of installed capacity for processing of – and domestic demand for – post-consumer plastic, coupled with overall low consumer awareness of recycling potential. As can be seen in Figures 1 and 2, both collection for recycling (CFR) rates and installed capacity for processing are low, with considerable variation across the major plastic resin groups. As a result, an estimated 87% of the value of recyclable materials – close to US\$4 billion annually – goes untapped.

¹ World Bank, Market study for Thailand: Plastics Circularity Opportunities and Barriers, 2020

Ranked 6th

Top sources of ocean plastic waste

60% of total plastic leakage from packaging sector

US\$4 billion

of the value of recyclable materials goes untapped annually

Figure 1 Comparison of CFR rates across all resins (2018)

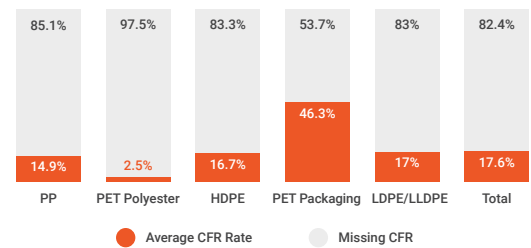


Figure 2 Missing capacity vs installed capacity for recycling of major resins in Thailand

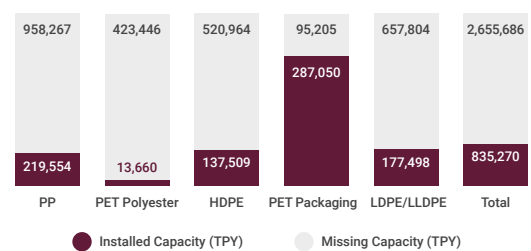


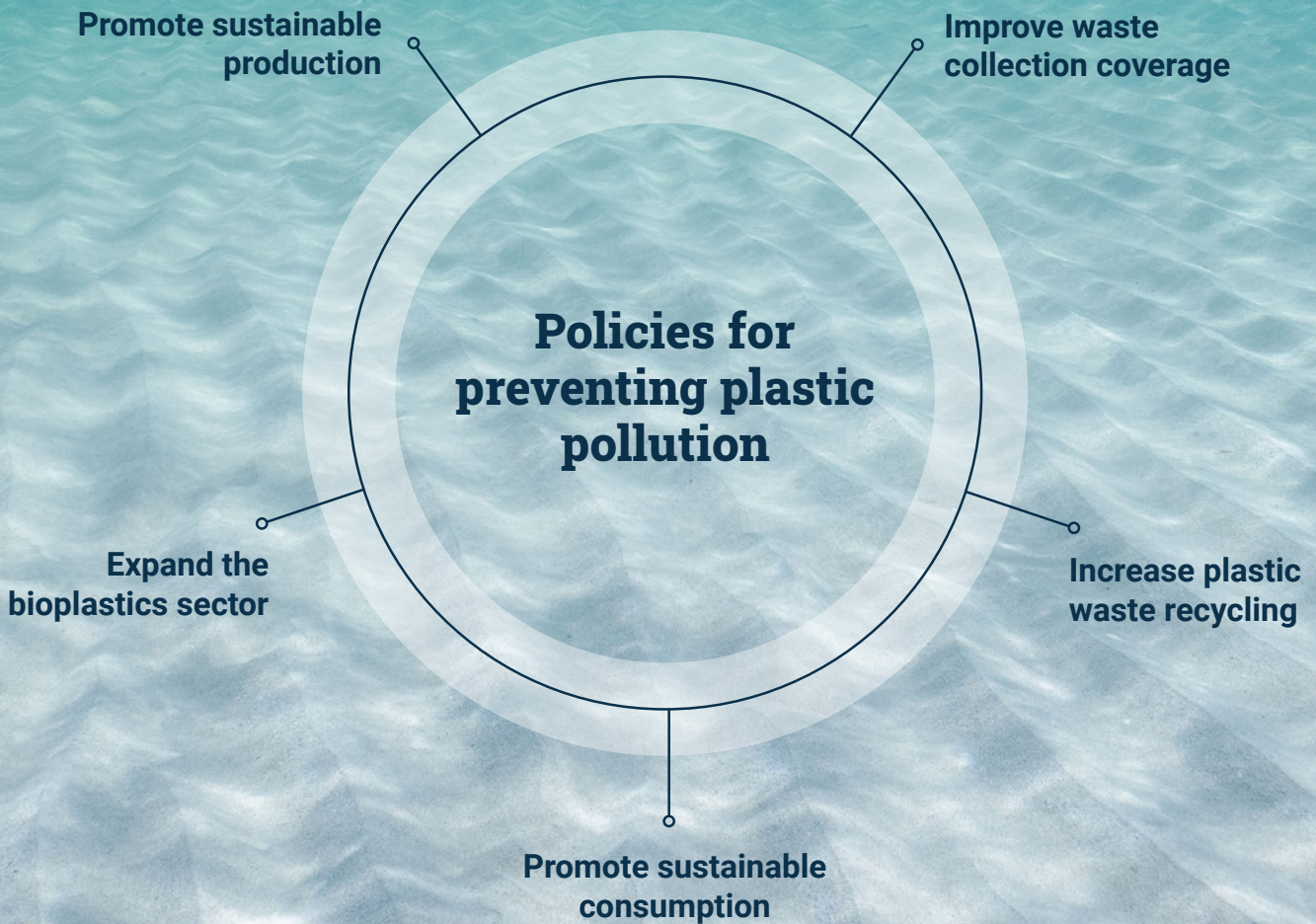
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Paving the Way for a Plastic-Free Future Through Policy

The Government of Thailand has taken action with landmark regional agreements to address marine debris issues, and implemented several policies aimed at preventing plastic pollution by improving waste collection coverage, increasing plastic waste recycling, promoting sustainable consumption and production through green public procurement policy, and expanding

the bioplastics sector. The National Roadmap on Plastic Waste Management (2018-2030) is guided by circular economy principles and sets aggressive goals around the elimination of single use plastic bags and other top sources of plastic waste by 2022, with development of more environmentally-friendly alternatives, and 100% recycling of plastic waste by 2027.



Opportunities for Growth in Thailand

Our initial research and country-specific activities suggest there are promising solutions to Thailand's plastics problem that need further focused attention, support and investment in order to scale and fulfill their potential.

We identified five areas of opportunity to advance the circular economy and reduce plastic waste in the short- and long-term, presented in the following section along with promising examples of how these opportunities are being met.

We anticipate ongoing engagement with key local stakeholders to further refine these strategies and identify additional opportunities that reflect local conditions and community assets.

01

Helping Local Recyclers Tap Into Global Demand for Recycled Products

02

Materials Innovation to Reduce Virgin Plastic Use

03

Informal Sector Inclusion & Support

04

Consumer Behavior Change

05

Focus Municipal Solid Waste Collection Systems toward Circularity



01

Helping local recyclers tap into global demand for recycled products

There is a growing global demand for post-consumer recycled (PCR) plastics as brands make commitments to incorporate recycled content into their product packaging, but local recyclers have largely not been able to tap into this demand. Gaps in the recycling value chain and the policy landscape have not created an enabling environment for developing the infrastructure, relationships and expertise to produce the high-quality, post-consumer product that is most in demand and has a higher profit margin.

Policies in the U.S., for example, create pathways for recycled plastic packaging like PET, HDPE and PP, to access high-value end markets as feedstock for food-grade packaging². In Thailand and across much of Asia, there are no frameworks to guide the use of PCR plastic in food and other consumer goods packaging, although in the last two years, several countries – including Thailand,

Korea, and China – have all begun to explore updates to regulations that could create more domestic end-use opportunities for PCR plastic³.

As a result, local recycling companies in Thailand need technical assistance and financial support in order to be able to compete in global markets for higher quality recycled products, such as food-grade packaging. Providing capital for these recycling capacities could help fill current gaps in the financial incentives and government support currently available. The injected capital could help recyclers reduce capital investment risk, develop their business models, and understand and comply with the environmental health and safety standards that global consumer goods companies require.

At the same time, Thailand's existing plastics recycling infrastructure could be further supported and optimized to meet regional demand in other markets, such as producing rPET for textiles for the apparel industry or processing recycled flexible and multilayer packaging into durable furnishings and construction materials.

02

Materials Innovation to Reduce Virgin Plastic Use

The Government of Thailand has set aggressive targets to grow the bio-circular green economy, defined as industries that promote inclusive, sustainable growth and reduce waste, pollution and dependence on finite resources. The country has also endorsed a Biotechnology Policy Framework and Strategy to Develop Thailand's Bio-industry (2018-2027), with the aim of having the bio-based sector contribute up to 10% of national GDP

by 2037. In this context, bioplastics are likely to have a more important role in in sourcing decisions around sustainable packaging. Startups and growing businesses will need support to get involved in bioplastics innovation and to diversify the bioplastics market. This could include pointing them towards the grants or government support available for SMEs, developing further research on the viability of alternative bioplastic materials, and leveraging the capital and expertise of the private sector to develop new materials and technologies.

² Recyclers can apply to the US Food and Drug Administration for Letters of Non-Objection (LNO), which outline conditions of use (e.g., for frozen foods or hot-filled pasteurized foods) for recycled plastics in food packaging applications. Once approved, processed material can be used in a more circular ("bottle-to-bottle") fashion.

³ Independent Commodity Information Service. Insight: the potential of recycled packaging for food contact in Asia. 2020.

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Corporations can apply their own resources in areas such as innovation challenges and accelerators, financial incentives and capacity-building programs to support the entrepreneurial ecosystem and can also partner with entrepreneurs to co-develop new technologies and products. For example, PTT Global Chemical Public Company Limited's Open Innovation Challenge invites proposals for Smart-Eco Innovation in product or process development, with plans to help innovators co-develop lab-to-market projects in Thailand's petrochemical industry.

Image Credit Fruita Biomed Co.,Ltd.



CASE STUDY

FRUITA BIO Ltd.
Functional BioPhysics Solution for the Earth

As another example, **Fruita Biomed Co.,Ltd.** is a tech startup that spun off from Fruita Natural Co.Ltd, a key player in the local beverage industry. Fruita Biomed started researching organic waste with the aim of developing a biopolymer. Currently, they produce home compostable and PHA bioplastics with a capacity of 35,000 metric tonnes per year. This material can be used for beverage bottles, cosmetic drug bottles, cling wrap and re-sealable bags. The company succeeded in raising US\$20 million in a pre-IPO round and is preparing for an IPO in the next year.

03

Informal Sector Inclusion and Support

Informal waste workers (IWWs) contribute significantly to recycling collection rates for most post-consumer plastic resins, especially PET. The materials collected by IWWs in the Bangkok metropolitan area allow the regional government to save approximately THB 500 million (US\$15.8 million) a year in avoided waste management costs, or approximately 8% of the total budget for waste management. Despite being the backbone of the recycling landscape, informal waste workers are not formally recognized and are more likely to experience poor working conditions, exploitative and extractive labour relationships with other actors in the recycling value chain, a lack of protective equipment, and lack of transparent price data. Support for these workers is vital to ensure positive socio-economic outcomes in the form of sustainable jobs, improved sanitation and the empowerment of women.



CASE STUDY

WONGPANIT
วงษ์พานิชย์

Wongpanit Co. Ltd., one of Thailand's leading recycling factories today has 200 franchise branches in Thailand and Laos and sells recyclables to processing industries in Thailand and abroad⁵. Wongpanit employs around 220 people at its head office in Phitsanulok, including disabled persons employed for simple tasks, and displays daily prices for all recyclable materials. Small suppliers are able to join the company as franchisees in exchange for a small fee⁶ and receive a five-day training workshop dealing with all aspects of solid waste management and how to start a successful recycling business. The franchise system has allowed Wongpanit to grow nearly 10% per year, supporting small waste collectors and improving the collection and sorting of valuable waste in the Phitsanulok wasteshed.

⁴ World Bank, Market study for Thailand: Plastics Circularity Opportunities and Barriers, 2020

⁵ GIZ, Recovering resources, creating opportunities, Integrating the informal sector into solid waste management, 2011.

⁶ WWF Thailand, Scaling up circular strategies to achieve zero plastic waste in Thailand, 2020

04

Consumer Behavior Change

Consumers have a critical role to play in reducing plastic waste and advancing the circular economy. A shift in consumer behavior is needed in order to reduce demand for virgin plastics, increase use of plastic alternatives, and improve segregation of recyclable materials at the collection source. Greater consumer awareness of the value and potential applications of recycled plastic, and

participation in the first phases of the recycling process – cleaning, sorting, and drop-off – will be critical to improving the recycling rate and building a consistent stream of feedstock for post-consumer uses.

Further research and experimentation with behavior change interventions are needed to ensure adoption of infrastructure and innovative solutions.



CASE STUDY

Eco Digiclean Klongtoei Project

The **Eco Digiclean Klongtoei Project** is a pilot project in the Klongtoei district of Bangkok sponsored by the Alliance to End Plastic Waste, focusing on the use of digital technology to help manage plastic waste at the source. The project’s SMART COLLECT digital platform, one aspect of the pilot, aims to educate individuals about pre-sorting their waste and incentivize sorting and drop-off at local collection points by awarding digital points through the platform.



CASE STUDY



Recycle Me, finalist of the Circular Innovation Jam conducted by The Incubation Network, is an innovative mobile phone app that empowers consumers to make educated purchase decisions based on packaging and local recycling options. The app allows consumers to scan products on store shelves and obtain information about the product and its packaging, including where they may be disposed of locally. Thus, the app helps to educate consumers about their choices and encourage them to purchase eco-friendly products and contribute to source separation efforts.

05

Focus Municipal Solid Waste Collection Systems toward Circularity

The current municipal solid waste (MSW) system emphasizes collection, rather than a strategic integrated solid waste management (ISWM) approach that includes

source segregation, separate collection and transfer, sorting, recycling, recovery and disposal with an emphasis on maximizing resource use efficiency. The implementation of ISWM plans will be the task of the local administrative offices, which are responsible for waste management and will in turn need funding and technical assistance in order to shift the orientation of their waste

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collection efforts, as well as support in implementing technologies that can make the MSW system more efficient. With investment in these improvements, Thailand could see an increase in both quantity and quality of material recovered for recycling.

The Thailand Public Private Partnership (PPP) for Plastic and Waste Management Efforts is a multi-stakeholder initiative tasked with:

- Reducing marine plastic debris by at least 50% by 2027; and
- Creating a circular economy for 100% of all waste plastics in Thailand by 2027 through key focus areas: infrastructure, education, innovation, policy & legislation, and data.

As part of the PPP's infrastructure and education efforts, two pilot projects are currently being conducted in Rayong

and Klongtoei to test circular economy business models with the goal of collecting and recycling approximately 40 metric tonnes of plastics per month. The pilot programs have already resulted in 27 communities being trained to segregate waste effectively. Further scaling-up of this model is planned with support from the Alliance to End Plastic Waste.

The Thailand Institute of Scientific and Technological Research is developing pilots in several communities where technology and innovation are being applied to each step of collection and processing. The community waste management technology introduced in the pilots includes a complete semi-automatic waste sorting system, plastic type and color sorting unit and plastic flake production system. These technologies have enabled local authorities to generate an income of more than THB 10 million (approximately US\$300,000) a year by increasing the production of recycled plastic pellets by more than 40 tons per week.

Thailand Public Private Partnership for Plastic and Waste Management Efforts

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by at least 50% by 2027

Creating a circular economy
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The Future of The Incubation Network in Thailand

“There is no silver bullet that addresses the different needs and opportunity areas identified in this market report; rather, we need to find innovative solutions across a circular plastics value chain with participation from an ecosystem of private start-ups, government agencies, social enterprises, entrepreneur support organizations (ESOs) and civil society organizations.”

Scaling Solutions to Accelerate Startup Growth

We need solutions that improve existing practice and further innovate in areas that will help prevent plastic leakage in Thailand.

- 01 Existing recycling businesses, such as Asia Green Roads, REWASTEC, and FarmD need support to scale and access higher value end markets both domestically and in export markets.
- 02 Early stage technologies and ventures, especially around new end uses and new materials, need help to amplify their potential and move them from concept or lab stage to successful pilots and beyond.

Generating Knowledge and Insights

With growing attention on both the plastic leakage problem and circular economy solutions, Thailand is poised to be a hotspot that other markets will look to. As such, it is important that we continue to build an evidence base for “what works”.

- 01 Action-oriented research can help test experimental business models (for example, refill models) or interventions (such as consumer behavior change) that have the potential for significant impact on preventing plastic leakage.
- 02 Scientists and engineers at local universities, research institutions and corporate R&D should be engaged to help identify promising technologies and processes that could become future solutions for advanced recycling, better sorting or new materials.

Supporting the Ecosystem

We also need stronger connections among the various actors in the local ecosystem to share knowledge about the challenges and promising solutions, as well as to collaborate on projects.

- 01 Collaborations and partnerships, such as the Thailand PPP, can increasingly serve as platforms for innovative solutions to be tested and adopted within the national waste management system.
- 02 The Incubation Network’s member ESOs can play a leadership role in building the ecosystem to support entrepreneurs, start-ups and growing businesses.
- 03 Roundtables and site visits among local parties can validate the research and data available on an ongoing basis, as well as create opportunities to share best practices among peers and partner organizations.

What's Next

It is our view that by partnering with a diverse network of key partners to source, support and scale holistic innovative solutions to strengthen entrepreneurial ecosystems, we will be able to combat plastic pollution in Thailand, the region and beyond.

Join us →

Access regional connections, best practice and expertise; gain access to insights and connections; receive financial and technical support to scale your startup.

Work with us →

Rally more private investment and partnership to co-fund and help scale innovations

Partner with us →

Engage more government support of entrepreneurs to pilot and test solutions with public benefit

About

The Incubation Network

The Incubation Network is an impact-driven initiative that sources, supports and scales holistic innovative solutions to combat plastic pollution through strengthening entrepreneurial ecosystems with a diverse network of key partners.

Part of a highly collaborative community of startups and entrepreneurs, investors, partners and programs, The Incubation Network works together with industry players to tackle key barriers to address plastic leakage and advance a circular economy. This includes sourcing and supporting, to scaling early stage or pre-investment solutions and connecting compatible ecosystem players to reinforce the value chain in waste management and recycling.

Established in 2019, The Incubation Network is a partnership between non-profit organization, The Circulate Initiative and impact innovation company, SecondMuse. The Incubation Network is open to interested collaborators, corporations, and mentors, looking to address plastic leakage and advance a circular economy in South & Southeast Asia.

For more information, visit: incubationnetwork.com

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