



DRIVING CIRCULARITY IN PLASTIC WASTE MANAGEMENT AND RECYCLING IN THAILAND

ECCA Thailand Program

Final Report delivered to the ECCA Family Foundation

2021 - 2023

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Section 01

INTRODUCTION

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 plastic entering the oceans each year¹. The country has traditionally focused on solid waste collection, which has resulted in a relatively high waste collection rate: an average of 70% across the country. However, a lack of focus on integrated solid waste management principles, including recycling and circularity, has 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 plastic². Challenges to addressing plastic leakage include a lack of installed capacity for processing of — and domestic demand for — post-consumer plastic, and overall low consumer awareness of recycling potential. As a result, an estimated 87% of the value of recyclable materials — close to US\$4 billion annually — goes untapped.

Ranked 6th

Top sources of **ocean plastic waste**

322,000 **tons of plastic** entering oceans per year

60% from the **packaging sector**

US\$4 billion

of the value of **recyclable materials** goes **untapped** annually

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

2. The Incubation Network, 2021 Market Insights Report: Rethinking Plastic Waste in Thailand, 2021



[SecondMuse Foundation](#), the grantee and fiscal sponsor of this project, envisions a world with zero injustice and sustainable prosperity. Our mission is focused on a new approach called “Relational Wealth” that recognizes the interconnectedness of our world by prioritizing relationships for building inclusive and resilient economies. SecondMuse Foundation aims to inspire ways of thinking and actions to drive societal change at scale rather than unconsciously replicating the status quo on expanding this approach to a larger audience, learning from others in the field and on the forefront of this work, and advancing this tool together through collaborations and partnerships. SecondMuse Foundation partners with SecondMuse, which is the implementer of this project.

[SecondMuse](#) is a global impact and innovation company that works with communities focused on climate, equity, and tech to build resilient economies that benefit people and protect the planet. Our impact-driven methodology prioritizes collaboration and relational infrastructures with key stakeholders to develop market-driven solutions that transform our current systems. Over the last 15 years, we have designed, developed and implemented a mix of innovation programming and capital investments that have reached over 160 countries and territories.

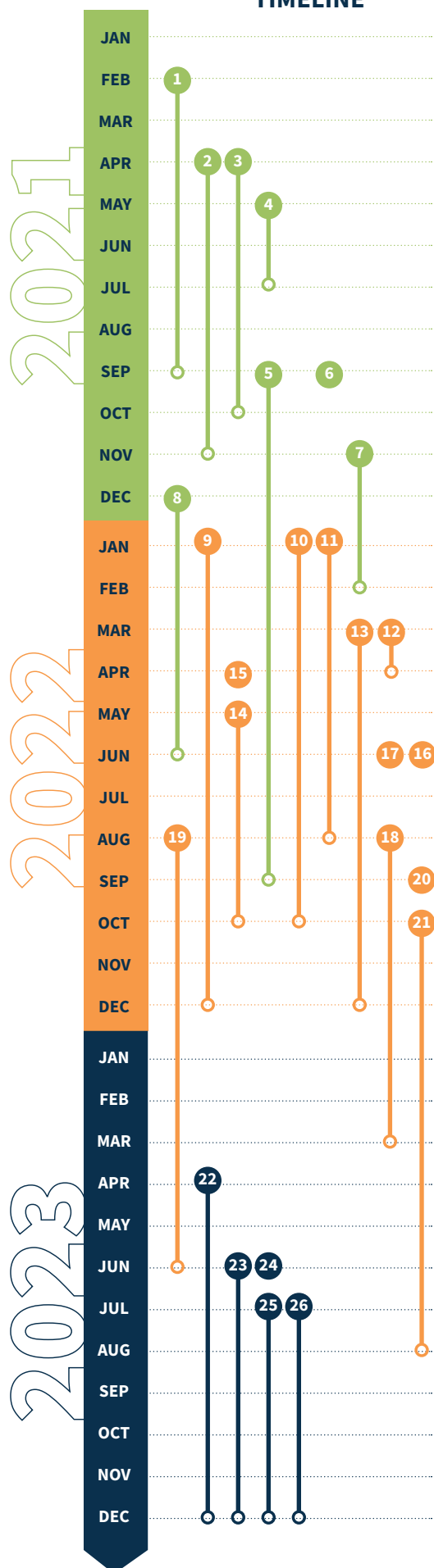
[The Incubation Network](#), a partnership between [The Circulate Initiative](#) and [SecondMuse](#), was conceived in 2019 as a three-year initiative to create new resilient waste systems by developing, promoting and investing in technologies, business models and entrepreneurs focused on ocean plastic pollution mitigation and the creation of more circular economies in South and

Southeast Asia. The Incubation Network worked hand in hand with communities at the heart of the waste management industry, and at the intersection of the public, private and philanthropic sectors, to bring the technical and financial resources necessary to source, support, and scale plastic pollution prevention, waste management, and recycling innovations, primarily across 5 countries: India, Indonesia, Thailand, Vietnam and the Philippines. The Incubation Network concluded in 2023 after three years of enabling and uplifting the Asia plastics innovation ecosystem.

In 2021, with the generous support of the ECCA Family Foundation, The Incubation Network (and subsequently SecondMuse, after The Incubation Network’s conclusion) had the opportunity to expand the depth of its work in Thailand, through the implementation of local ecosystem-building programs and product and service development. This three-year site-specific program aimed at: better understanding Thailand’s challenges, gaps, and areas of opportunity; engaging key actors across the value chain to facilitate multi-stakeholder collaboration and co-creation of initiatives; and funding and supporting a portfolio of locally-driven innovations and solutions that can address contextual needs.

This final report memorializes this partnership by summarizing the work conducted over the course of the three years, including the successes, challenges and lessons learned, as well as the impact it has had on Thailand’s waste management and recycling ecosystem.



PROGRAM/ACTIVITY
TIMELINE

EXECUTIVE SUMMARY

Over the course of the ECCA Thailand Program from January 2021 - December 2023, SecondMuse implemented a diverse range of initiatives, including research exercises, cohort-based incubation and tailored venture building programs, among others.

NAME OF PROGRAM/ACTIVITY

- 1 Landscape Assessment & Market Insights Research Report
- 2 Stakeholder & Network Mapping Assessment
- 3 Development of Ocean Plastic Mapping Tool
- 4 Bangkok Design Week 2021 Workshops (with Circular Design Lab)
- 5 Thailand Waste Action Network (with STEAM Platform & KX Innovation)
- 6 Official launch of The Incubation Network in Thailand
- 7 Thailand Waste Management and Recycling Academy (WMRA) Phase 1 (with Seedstars)
- 8 Hat Yai Green Hackathon Prototype Pilot Phase (with Satarana)
- 9 Thailand Plastics Circularity Accelerator (with Alliance to End Plastic Waste)
- 10 Customized Venture Building - PlastX
- 11 ADB Plastics Circularity E-Learning Module (with STEAM Platform)
- 12 Thailand SME Scale Up Program for Plastics Circularity Phase 1 (with Sasin SEC and Weable2)
- 13 Customized Venture Building - Green2Get
- 14 The Single-Use Plastics Challenge (with GIZ and Prevent Waste Alliance)
- 15 Ocean Plastic Mapping Tool Workshop 1 (with Rise Impact)
- 16 Ocean Plastic Mapping Tool Workshop 2 (with Circular Design Lab)
- 17 First In-Person Stakeholder Engagement and Networking Event
- 18 Thailand Extended Producer Responsibility (EPR) Policy Research Report
- 19 Thailand Waste Management and Recycling Academy (WMRA) Phase 2 (with Seedstars)
- 20 Launch of *The Changing Tides* Podcast
- 21 Thailand SME Scale Up Program for Plastics Circularity Phase 2 (with Sasin SEC)
- 22 Customized Venture Building - Green2Get (Extension)
- 23 Customized Venture Building - SUP Challenge Extension
- 24 Second In-Person Stakeholder Engagement and Networking Event
- 25 Customized Venture Building - Blue Ocean Plastic
- 26 Customized Venture Building - HOSO

The initial stages of SecondMuse's work were focused on developing a better understanding of the Thailand plastic waste management ecosystem in order to lay the necessary groundwork for more informed programming.

Early-stage research focused on the country's waste management and recycling industry as well as its innovation ecosystem, which culminated in the publication of the [2021 Market Insights Report](#) which was released in conjunction with The Incubation Network's official launch in Thailand in September 2021. The launch also included an announcement of planned key programs to be implemented and received decent media coverage, most notably a 'Tech in Asia' [feature](#) and an [article](#) in e27's weekly newsletter.

In parallel with the launch of The Incubation Network, SecondMuse designed and developed various programs based on the findings and insights generated through its stakeholder engagement and research process initiated earlier in the year, and was subsequently able to accelerate implementation with the hiring of Sirinchayaa (Bow) Preechapatsakool as the local Ecosystem Consultant for Thailand.

In general, this suite of programs aimed to

- 1 provide catalytic support for individual companies at different growth stages to foster innovation, development and potential scaling of solutions for improved plastic waste management in the country, and
- 2 provide platforms to facilitate multi-stakeholder collaboration among the various actors within the ecosystem and advance local research.

Along with this variety of programs, SecondMuse also ran initiatives to build and strengthen the ecosystem such as (i) establishing a [Waste Action Network](#) in partnership with [STEAM platform](#) to foster cross-sector knowledge sharing and connections; (ii) collaborating with the [Environmental Research Institute of Chulalongkorn University \(ERIC\)](#) to conduct a [research](#) piece on the potential impact and implications of the upcoming national-level Extended Producer Responsibility (EPR) policy rollout; and (iii) running in-person stakeholder engagement and convening events in Bangkok which brought together industry actors from across the ecosystem and facilitated conversations on collaboration and business partnerships.

A broad summary of key programs and initiatives implemented under the ECCA Thailand Program



Thailand Waste Management & Recycling Academy Phase 1 and Phase 2 [READ MORE](#)

In partnership with Seedstars – an incubation and acceleration program for entrepreneurs and early-stage ventures to spur innovation in plastic waste management.



Thailand SME Scale Up Program for Plastics Circularity Phase 1 and Phase 2 [READ MORE](#)

In partnership with Sasin Sustainability and Entrepreneurship Center (Sasin SEC) – targeted growth support program for Thailand-based SMEs within the plastic waste management and recycling industry.



The Single-Use Plastic (SUP) Challenge [READ MORE](#)

In partnership with [GIZ](#) and [Prevent Waste Alliance](#) – an intensive program focused on accelerating single-use plastic reduction projects specifically within the food and beverage (F&B) sector across five countries within the South and Southeast Asia region.



Thailand Plastics Circularity Accelerator [READ MORE](#)

In partnership with Alliance To End Plastic Waste – a demand-driven, 12-month support program for recycling businesses particularly with solutions for the management of low-value and hard-to-recycle plastic waste.



Customized Venture Building partnerships [READ MORE](#)

Non cohort-based, direct support engagements with high-potential solution providers and/or organizations that can address specific challenges and needs within the local context and system. Example engagements include: a prototype testing initiative with Satarana and the Hat Yai municipal government; digital recycling marketplace development with Green2Get; improving waste collection systems on Koh Samui with Blue Ocean Plastic; and extended support for five ventures that participated in The SUP Challenge.

Section 03

IMPACT (1/2)

SecondMuse tracked a set of metrics to measure the overall impact of the program based on its goals of building a more inclusive and robust circular economy for plastics in Thailand and strengthening the plastic waste management and recycling ecosystem across all levels of the value chain.

IMPACT THEME & INDICATOR(S)

TOTAL / RESULT

REDUCED LEAKAGE

- ✓ # metric tons of **plastic waste diverted** (by ventures/companies supported by SecondMuse)



24,806 MT

(total across 3 years, based on self-reported and best-available data estimates at the time of collection)

IMPROVED LIVELIHOODS

- ✓ # informal workers **reached**
- ✓ Contribution to **improved livelihoods**

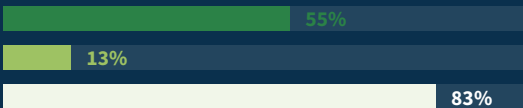


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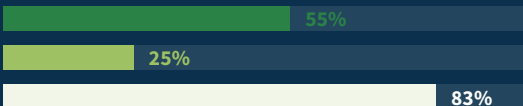
from 3 companies

% **respondents** reporting improved conditions, based on curated surveys done with 3 different groups of informal workers. Selected indicators presented below:

Fair & predictable payment



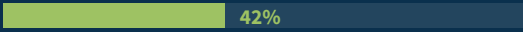
Income growth



Sense of dignity & agency



Career growth



NOTES

For Green2Get: Survey results are not specifically linked to the Hero App, but rather the general experiences of the workers which can be influenced by various macroeconomic conditions. Full functionality of Hero App has only been available since Aug 2023; thus, the majority of users from the Saleng community are still adjusting to the app and have reported a usage rate of less than once per month. Please refer to the full report for a holistic view of findings.

*For all groups, no areas were reported as "worsened" by respondents

**Full report from FHI360 available [here](#)



Blue Ocean Plastic (waste workers)








Green2Get (waste workers)



Nano Onions (seaweed farm workers)

IMPACT (2/2)

SecondMuse tracked a set of metrics to measure the overall impact of the program based on its goals of building a more inclusive and robust circular economy for plastics in Thailand and strengthening the plastic waste management and recycling ecosystem across all levels of the value chain.

IMPACT THEME & INDICATOR(S)		TOTAL / RESULT	
MORE, BETTER VENTURES SCALED			
✓ # ventures/companies engaged	→	 43	(total engaged through support programs and/or 1:1 engagements, with 21 out of 43 receiving targeted growth support)
✓ # ventures/companies progressing toward impact and scale	→	 20	(representing 95% of ventures/companies receiving targeted growth support)
ECOSYSTEM CONNECTED, ACTIVATED			
✓ # strategic partnerships created and supported	→	 60	(quality connections such as pilot partners, business collaborations, MoUs, etc.)
SOLUTIONS AMPLIFIED			
✓ \$ additional capital invested	→	 US\$ 222,000	(across 2022-2023)
✓ # audience reached	→	 679,566	<ul style="list-style-type: none">• Social Media Posts (Thailand-related content across LinkedIn, Facebook and Twitter)• Networking Event Attendees• YouTube Videos (Thailand-related content)• Newsletters (Thailand-related content)• The Incubation Network Newsletters – Average Opens

Section 04

SUMMARY OF KEY PROGRAMS AND PROJECTS



Key Program 01

Thailand Waste Management and Recycling Academy Phase 1 & 2

The Thailand Waste Management and Recycling Academy (WMRA) was a two-phase program implemented in partnership with Seedstars, with the aim of supporting the growth of early-stage entrepreneurs with innovative solutions to improve plastic waste management and reduction in Thailand.

In Phase 1, a cohort of 11 ventures were selected to undergo a 9-week intensive incubation period which included webinars, mentorship, speaker sessions and a public Demo Day where the cohort showcased their solutions to investors, corporates and other stakeholders from relevant industries. More than 80% of the participants reported significant progress for their ventures after the program, including roughly one-third who reported an increase in sales, more than

55% who reported progress in securing funding, and five ventures who were able to translate their initial ideas into a business model.

For Phase 2, four of the most promising ventures from the initial cohort — Micro Greentech, ReNew Innovations, Reboon and PLA+ — received follow-on customized support to further establish proof-of-concept of their plastic waste reduction solutions presented in Phase 1, and take the next step in their growth journey towards building a sustainable business model. After a 9-month support period, all four ventures were able to successfully transition their ideas to prototype development and/or pilot implementation in real-world settings and have been able to establish meaningful relationships with different ecosystem players relevant to their work. Below is a summary of the cohort's key achievements during the program:

WATCH VIDEO

WASTE



CASE STUDY

Micro Greentech

Micro Greentech (MGT) developed a **working prototype of their Reverse Vending Machine (RVM) for PET bottle collection**. The prototype was launched during a community running event in collaboration with the Nakhon Pathom municipal government, and continues to be pilot tested at different locations to gauge effectiveness and community reception in different settings.

WATCH VIDEO



CASE STUDY

ReNew Innovations

ReNew Innovations successfully **product-tested their bio-coating solution with various private sector stakeholders**, most recently with a local company that produces food-grade packaging products such as food trays and coffee cups made out of cassava starch. In parallel, ReNew Innovations also developed a new variation of their solution which utilizes a different formulation and mix of materials that can reduce the cost of their product significantly, and has been working with Kasetsart University to further test industry application.



WATCH VIDEO



CASE STUDY

Reboon

Reboon established and set up a **waste separation and material recovery center within Wat Chonprathan temple as their first pilot site**, in collaboration with the temple's personnel. The initiative is currently managed by two hired staff and supported by a temple monk who has been overseeing the work and encouraging participation from fellow monks as well. Reboon has since been contacted by several external organizations to potentially replicate their model at other temples.



WATCH VIDEO



CASE STUDY

PLA+

PLA+ established collaboration with various stakeholders and corporate partners, including local shopping malls, to **run waste collection and recycling drop-off points at different locations within Bangkok**, and diverted approximately **six metric tons of plastic waste away from landfill** during Phase 2. In parallel, they have been **conducting tests on the application of recycled PLA for 3D filament printing** and continue to partner with a local university to test the feasibility of industrial composting of PLA with food waste.





Key Program 02

Thailand SME Scale Up Program for Plastics Circularity Phase 1 & 2

The Thailand SME Scale Up Program for Plastics Circularity, a two-phase program implemented in partnership with [Sasin Sustainability & Entrepreneurship Center](#) (Sasin SEC), was SecondMuse's first foray into an SME-exclusive program, driven by its vision of engaging new segments of stakeholders in an effort to drive change at a systems level.

The program targeted SMEs within the plastic waste management and recycling industry with the goal of (i) increasing their visibility, scalability and investment-readiness; (ii) creating opportunities for business collaboration between corporates, brand owners and SMEs; and (iii) strengthening the local circular economy ecosystem and network towards improving plastic waste management in the country.

Despite initial challenges in identifying and engaging local SMEs, with the support of local engagement partner [Weable2](#), the program eventually received more than 90 applications from a diverse range of companies from relevant industries.

Phase 1 involved a total of 21 SMEs that participated in capacity building workshops and engagement activities with experienced professionals and industry experts on the topics of (i) Plastic Circularity Business

Models for Growth and Sustainability; (ii) How to Prepare a Pitch Deck and Present to Investors; (iii) How SMEs Can Access Funding for a Circular Economy for Plastics; and (iv) Trends in Sustainability and Economic Development in the Next Decade. Overall, the sessions were well received by participants, especially those based outside of Bangkok that typically have less access and exposure to programs of this nature. Despite in-person sessions being held in Bangkok, participation and attendance remained high — a testament to the appetite of such programming among SMEs in Thailand.

Phase 1 concluded with a final pitching session for the SMEs, 18 of whom participated and pitched to an audience of prominent industry actors and stakeholders. Of this cohort, five SMEs — Nam Ngai Hong, MBJ Enterprise, S.P. Paper and Tube, BMP Chemicals, and Union J. Plus — moved on to Phase 2, where each company was provided grant funding, mentorship and tailored technical assistance to support with the development and growth of their respective solutions and businesses. After a 10-month support period, all five SMEs had established relevant strategic partnerships, further iterated solution prototypes, and identified clear developmental roadmaps for sustained future growth. Below is a summary of the cohort's focus areas during Phase 2 and their respective progress and achievements:

WATCH VIDEO



CASE STUDY



MBJ Enterprise

MBJ Enterprise successfully **produced initial prototypes of pallets made out of recycled multilayer plastic waste**, in collaboration with development partners from China. Subsequently the company focused on establishing **readiness for a potential business opportunity with major industry players** to be a long-term supplier of recycled pallets. MBJ was connected with the [Center of Excellence in Petrochemical and Materials Technology](#) (PETROMAT) for **technology verification of their current solution of using PCR multilayer plastics extracted from landfills** to create compound resins that can be used as raw material for pallet production and other applications. MBJ also worked on risk management and business costing as well as MoU preparation for the potential business opportunity.

WATCH VIDEO



CASE STUDY



Union J. Plus

Union J. Plus focused research and development (R&D) efforts on improving compound formulas for their recycled resin pellets, with a specific focus on **LDPE pellets to serve a growing market demand from shrink film producers** looking to comply with European tax incentives that require at least 30% recycled content. The company successfully **secured an MoU with prominent local FMCG brand Osotspa**, to be an offtaker of plastic packaging waste which will be used as feedstock for recycled compound resins. Union J. Plus also worked on conducting internal ESG assessments for the company in preparation for future investments from external capital providers.

WATCH VIDEO



CASE STUDY



BMP Chemicals

BMP Chemicals streamlined R&D to focus on developing a solution for the **decolourization of recycled plastic waste towards improving the quality of post-consumer recycled (PCR) resins in the local market**. They successfully developed and lab tested this new product and **connected with Union J. Plus as a potential early adopter**, with preliminary discussions taking place and plans for industry-scale testing to be conducted in the near future. The company also **won the 'Sustainability Award' at the 2023 SCG Bangkok Business Challenge** for their work and secured an opportunity to **participate at the Hello Tomorrow APAC Investor Day** in Singapore in September 2023.

WATCH VIDEO



CASE STUDY

**S.P. Paper & Tube**

S.P. Paper & Tube worked on **reviewing their customer segments and target market for their Enviro Board products made out of post-industrial recycled (PIR) beverage cartons**, and subsequently focused their efforts on being a **potential material supplier for the furniture industry**. S.P. Paper was connected to several furniture companies to understand industry requirements and quality standards of materials and boards, and developed partnerships with local players to utilize their products for various applications. **The company also completed a business model canvas exercise** to better understand its value proposition and created an **investor deck for future pitching**.

WATCH VIDEO



CASE STUDY

**Nam Ngai Hong**

Nam Ngai Hong (NNH) established a collaboration with **Mae Fah Luang Foundation and Doitung Cafe to recover and recycle used coffee grounds as feedstock for their new line of products** which utilizes bio-based material to replace virgin plastic. They were also connected with local company C-Wallet to **conduct carbon footprint analysis for their products** in order to better communicate the impact of their work. NNH is working towards obtaining relevant certification to further validate product biodegradability and compostability, and will continue to be a part of Sasin's network as an industry stakeholder for future engagements and dialogue in this field.

Key Program 03

Thailand Plastics Circularity Accelerator

The Thailand Plastics Circularity Accelerator (TPCA) was a 12-month program implemented in partnership with the Alliance to End Plastic Waste (AEPW) with the goal of strengthening the local circular economy for plastic waste, in particular the end market demand for low-value, hard-to-recycle plastic waste.

TPCA provided customized support to four ventures: Eco Friendly Thai, Second Life, Trash Lucky, and CIRAC. Cohort members were assigned industry experts and corporate professionals as mentors to provide tailored advice and guidance for business growth. They also gained access to specific technical assistance providers

who rendered support in areas such as pricing strategy and financial modeling, HR and administration, and fundraising, in both one-to-one and group settings.

Overall, all companies achieved milestone growth across the Venture Development Framework, SecondMuse's proprietary tool to measure a venture's progress throughout a program. All showed healthy progress in the advancement of their solutions, and were subsequently connected to AEPW for continued collaboration to meet existing market demand generated from AEPW's ongoing work in Thailand. Below is a summary of the cohort's key achievements during the program:

WATCH VIDEO



CASE STUDY

Trash Lucky

Trash Lucky focused on the **pilot implementation of their new smart recycling bin prototype**, which aims to improve efficiency in the collection of recycled plastic material and delivery to waste collectors. The company worked with a consultant to **develop a web-based app for the smart bin which will facilitate efficient communication** between Trash Lucky and their network of waste collectors.



WATCH VIDEO



CASE STUDY

**CIRAC**

CIRAC focused on **setting up their new multilayer plastic waste processing plant** with increased capacity, including **finalizing intellectual property applications** for their new reactor machine and **developing key business partnerships** such as feedstock material suppliers and customers for by-products.

WATCH VIDEO



CASE STUDY

**Eco Friendly Thai**

Eco Friendly Thai (EFT) **secured a key corporate partner, Tetrapak**, that has engaged EFT to process its PIR beverage carton waste and to collaborate towards improving EFT's capacity to collect and process PCR cartons as well. The company made **infrastructure improvements to their internal recycling process** (i.e. installation and testing of a new drying machine) and provided test samples of their upcycled construction bricks and boards to two potential customers, Green Shelter and Recycoex.

WATCH VIDEO



CASE STUDY

**Second Life**

Second Life worked on **creating client pipelines and crafting effective messaging for different segments of clients** (such as how and why plastic credits are needed) to inform client engagement strategies. In addition, they **partnered with MARS Petcare to develop a post-consumer waste collection app** which **enables the collection of low-value multilayer plastic waste** to be sent to their partner Asia Green Road for recycling into new products.

Key Program 04

The Single-Use Plastic (SUP) Challenge

WATCH VIDEOS

The **SUP Challenge** was a regional program sponsored by SecondMuse Foundation, implemented by The Incubation Network and funded by the PREVENT Waste Alliance, an initiative of the German Federal Ministry for Economic Cooperation and Development (BMZ), and ECCA Family Foundation. The SUP Challenge is part of PREVENT's Innovate & PREVENT program, and was focused on developing and accelerating single-use plastic reduction projects specifically within the F&B sector across five countries (India, Indonesia, Philippines, Thailand and Vietnam).

In Thailand, two Entrepreneur Support Organizations (ESOs) — Seedstars and [RISE Impact](#) — supported

eight ventures in developing and implementing pilots for their respective solutions. Out of the eight, five companies successfully conducted 12 pilots with 11 F&B partners over a 30-day testing period. The variety of solutions and pilot programs conducted provided a great deal of insight into the feasibility of diverse upstream solutions, specific to the conditions and context of the Thailand F&B sector. Data and results generated from the challenge have been compiled and presented in the [Market Insights Report](#) and [Technical Playbook](#), published in November 2022. Two Thai companies were selected for the program's [Life Cycle Assessment \(LCA\) analysis](#). In addition to the insights and data generated, the SUP Challenge created connections between ventures and F&B partners who may not have worked together otherwise.

SUP Challenge Resources



[Insights Report](#)



[Technical Playbook](#)



[Life Cycle Assessment \(LCA\) Report](#)



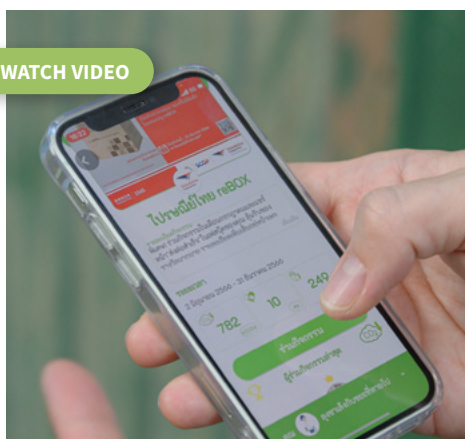
Key Program 05

Customized Venture Building Support

The support provided by ECCA enabled SecondMuse with the agility to respond to local needs and seize opportunities to drive impactful change across the ecosystem as they arose. SecondMuse provided direct

customized support to a total of ten companies to tackle and address specific challenges across the plastic value chain. The results of these engagements are summarized briefly here:

WATCH VIDEO



CASE STUDY



Green2Get

Developed and launched the Hero Recycle App, a **digital marketplace for more efficient trading of recyclable material** among stakeholders within the value chain. Since official launch, the Hero Recycle App has registered and approved more than **845 recycling companies** and **facilitated the trading of more than 160 metric tons of recyclable material** in total, in the span of four months.

WATCH VIDEO



CASE STUDY



Blue Ocean Plastic Recycling

Established three new waste banks on Koh Samui that are **led and managed by local community leaders and supported by a network of waste collectors** from each respective community. All waste banks have been equipped with washing lines to **enable the collection and management of low-value plastic waste in addition to regular high-value materials**. The company began testing an **incentive model to spur collection of low-value plastic** and received and **delivered their first major order of eco-bricks**, which are partly made out of recycled low-value plastic waste.

WATCH VIDEO



CASE STUDY

**HOSO**

Developed **three new prototypes specifically designed for the rice industry to replace single-use packaging**, leveraging the experience and expertise of HOSO's network within the packaging industry. They **established partnerships** with social enterprise Dee Mee Sook, a local goods seller, as well as rice production and R&D company Kla Klang, and **piloted their prototypes at a launch event** held in November 2023 at Dee Mee Sook's shop in Central Rama 3 shopping mall. Prototypes are **currently being user-tested** by selected Dee Mee Sook members and are also available to the general public.

CASE STUDY

**PlastX**

A tech startup based in Australia, PlastX developed an application that **enables businesses to responsibly source post-consumer recycled material through its digital and physical chain-of-custody platform**. On the back of a successful pilot in Noida, India, PlastX **secured an MoU with multinational company Veolia-Suez for a pilot in Thailand** with the aim of providing high-quality LDPE feedstock. Despite starting from scratch in the country, PlastX managed to **secure and sign agreements with key in-country implementation partners and laid all necessary foundational pieces to operationalise a pilot** in Thailand with SecondMuse's assistance over a 10-month period. However, the pilot did not materialize due to the sudden market exit of their main buyer Veolia-Suez just before commencement. Despite the setback, PlastX managed to pivot and instead ran a pilot in Malaysia with new partners.

CASE STUDY

**Satarana**

In partnership with WWF Thailand under the Plastic Smart Cities program, Satarana held a Green Hackathon event in December 2021 in the city of Hat Yai, Thailand with the aim of identifying and developing low-cost, high-impact solutions that can improve plastic waste management systems at the local level. With support from SecondMuse, the Hackathon's **scope was broadened to include a prototype development and testing stage**, where two prototypes were trialed: (i) alternative food packaging made out of beeswax, tested at a cafeteria within Prince of Songkla University; and (ii) classifiable garbage bags and tags as well as a collection operating system, **implemented in partnership with the Hat Yai municipal government**. Overall, both pilots provided useful insights that Satarana used to identify further iterations and next steps for the solutions, and seeded a valuable partnership with the Hat Yai municipal government.



In addition to the above, as a follow-up to the SUP Challenge, SecondMuse initiated direct support engagements with five companies from the initial cohort for a period of six months, with the overarching objectives of:

- 1 determining the business viability and scaling potential of upstream solutions as an alternative to single-use plastics across different sectors; and
- 2 generating insights and recommendations in view of building a stronger enabling environment for upstream solution growth in Thailand.

This initiative also sought to align with the Government of Thailand's Plastic Waste Management Action Plan Phase 2 (2023 - 2027), which focuses on building upstream solutions towards prevention and reduction at source. A summary of results of these engagements are shared below:

[WATCH VIDEO](#)


CASE STUDY

Delifill

Implemented **business-to-business (B2B) pilots for their refill and reuse services** with two partners (a hostel and a cafe) for three months and later secured another B2B customer with another local hostel. For business-to-consumer (B2C) operations, Delifill recorded 102 customers via their online platforms and approximately 300 customers via their physical store over three months since its official launch. To accommodate this increase of activity, Delifill **expanded their team** and hired one full-time staff member to manage the physical store and deliveries. Delifill also **developed a strategic partnership with local brand Kingstella** that is currently providing Delifill with a more diverse product range at more competitive prices, and successfully **created their own line of homecare products** which aims to provide an option that is **price-competitive with low-range products available commercially**, especially for B2B customers.


[WATCH VIDEO](#)


CASE STUDY

DropRefill

A company that produces cleaning products in the form of water-soluble tablets, DropRefill **implemented B2B pilots** with six partners (two hostels, two cafes, one mall, and one gym) over three months and made **infrastructure improvements for their production facility**, which has enabled them to **improve production efficiency and also create a new range of products** (such as glass and floor cleaners). The company **engaged with the Thailand Institute of Scientific and Technological Research (TISTR)** to get the full range of their products lab tested as a quality benchmark with other homecare cleaning products in the market. DropRefill is currently self-sustaining due to stable B2C revenue from the market, allowing flexibility to continue expanding B2B operations.

DropRefill

WATCH VIDEO



CASE STUDY



Nano Onions

Established a **self-cultivated *Ulva Rigida* seaweed farm in collaboration with a local social enterprise in Chantaburi**, with a capacity of 200 kg of raw seaweed material per cycle (every three weeks). Using this material, the team successfully **produced a stable resin formulation that can be used to create seaweed-based alternative products** to plastic after several rounds of lab tests, with the latest formulation bearing similar properties to raw material used to produce paper straws. The company's next focus is to procure additional raw material (key components for latest formula) before they can continue with final physical property testing and creation of the first batch of home-compostable drinking straw prototypes.

WATCH VIDEO



CASE STUDY



KIDKID

Creator of reward-based app ECOLIFE that incentivizes users for single-use plastic reduction actions, KIDKID **signed an MoU with the Thai Listed Companies Association (TLCA) to promote the use of ECOLIFE to member companies** as an environmental data management and awareness platform. As a result, **more than 100 companies committed** to adopt ECOLIFE internally as of December 2023. KIDKID also **secured more than 10 new merchants** onto ECOLIFE as incentive providers to further encourage consumer behavior change on single-use plastic reduction, and ran **environmental awareness campaigns** in partnership with several prominent brands such as Yves Rocher and Uniqlo. In addition, KIDKID **established a partnership with TikTok, Bangkok Metropolitan Administration and the Ministry of Natural Resources and Environment** to run a waste separation campaign and other awareness programs, where ECOLIFE was promoted and used for data management.

WATCH VIDEO



CASE STUDY



Micro Vending Tech

Produced **10 new and improved refill vending machines and installed them at 10 different locations within the Nakhon Pathom municipality**, in partnership with local laundromats, neighborhood marts, and restaurants, among others. All units are linked to Micro Vending Tech (MVT)'s web server where the team will be able to track and monitor key information and data remotely. As a result of the pilot, MVT **signed an MoU with local laundromat chain Toki**, where MVT's refill machine will be included as part of Toki's standard franchise setup to replace the default single-use sachet vending machines. Toki currently has 75 branches across the country and is planning to double that amount through franchising in 2024.

Section 05

STAKEHOLDER ENGAGEMENT AND NETWORK BUILDING INITIATIVES

As a complement to the key programs described above, SecondMuse ran various network-building initiatives with the purpose of promoting cross-sector collaboration and strategic business partnerships among stakeholders within the ecosystem, including:

Thailand Waste Action Network (WAN), in partnership with STEAM platform, to foster cross-sector knowledge sharing and connections. Highlights include:

Establishment of a **coalition of 84 members from 61 organizations** including corporates, government agencies, SMEs, startups and universities

Exposure of more than 500 people, including students, entrepreneurs and policymakers, to circular economy topics

Production of **new multimedia content and events** related to the circular economy for plastic and waste - **13 VIDEOS, 5 NEWSLETTERS, 25 BLOG POSTS, 8 EVENTS**

Establishment of a partnership between **STEAM platform** and the Asian Development Bank (ADB) to produce a Plastics Circularity Economy E-Learning Course

An in-person Demo Day for

Techbite Accelerator 4.0

which showcased connections of varied stakeholders **brought together by the WAN**



Two in-person stakeholder engagement and convening events in Bangkok, held in 2022 and 2023 respectively. Event highlights include:



June 2022

The first event was attended by 60+ participants, including ventures and SMEs from SecondMuse's programs as well as corporates, academics and industry stakeholders from within our network. The event included a panel session, where a lineup of panelists discussed the current plastics management and recycling landscape in Thailand along with upcoming opportunities, challenges and trends. In addition, The Circulate Initiative led a learning session on Extended Producer Responsibility to provide foundational knowledge and awareness to participants in light of the potential national-level EPR policy rollout in Thailand. Overall, the event was positively received and some inter-company connections were established.

60+
PARTICIPANTS

Ventures, SMEs, Corporates,
Academics and Industry
Stakeholders



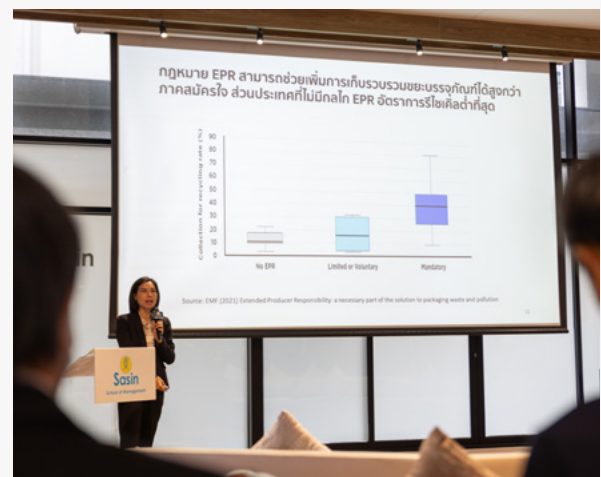
June 2023

The second event was attended by 50+ participants, including key public sector stakeholder, Bangkok Metropolitan Administration (BMA). The event included **two engaging segments:**

- 1 Sharing of key findings from the EPR policy research report conducted by Dr. Sujitra Vassanadumrongdee, Senior Researcher, Environmental Research Institute of Chulalongkorn University; and
- 2 Panel session on "Financial Instruments as a Growth Driver for BCG and Sustainability Ventures".

50+
PARTICIPANTS

Ventures, SMEs, Corporates,
Academics and Key Public
Sector Stakeholder



Section 06

COMMUNICATIONS HIGHLIGHTS

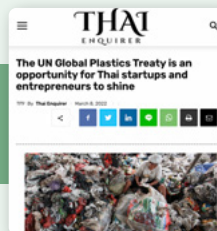
Contributing to conversations around the plastic waste issue and innovation ecosystem and spotlighting significant milestones and human stories emerging from the programs.

Key online media features of our work in Thailand



Bangkok Post

Connecting Asean innovators to battle plastic waste



Thai Enquirer

The UN Global Plastics Treaty is an opportunity for Thai startups and entrepreneurs to shine



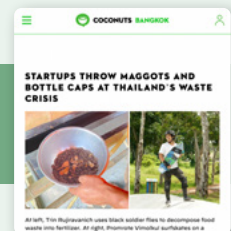
Manager Online

Global experts point out how to make EPR success across ASEAN



SD Perspectives

Poontong Recycle and PLA Plus, two startups combatting plastic waste



Coconuts Bangkok

Startups throw maggots and bottle caps at Thailand's waste crisis

‘Changing Tides with The Incubation Network’ Podcast

SecondMuse launched a limited podcast series in September 2022 – ‘Changing Tides with The Incubation Network’. The video podcast series was designed to delve into the pressing plastic waste challenges in South and Southeast Asia and to provide valuable insights and practical tips on how we can collectively combat this issue.

The podcast showcases conversations with a range of industry experts and practitioners such as from Siam Chemical Group, one of Thailand's largest conglomerates, and India-based innovative social impact organization Hasiru Dala. Together, they share their solutions, experiences, and strategies for addressing the environmental challenges we face today.



EP.3 | Techsauce Sustainable Focus

In this [interview](#) with Techsauce, SecondMuse's Program Consultant, Pakpoom Tanthaprabha, and Ms. Pilaiporn Namsirivat, Marketing Director at Nam Ngai Hong, share about the significant impact of the ‘SME Scale Up Program for Plastics Circularity’ in empowering companies like Nam Ngai Hong to elevate their sustainability impact.



Listen here



Apple Podcasts



Google Podcasts



Spotify

Section 07

STORIES OF CHANGE

Case Study 01

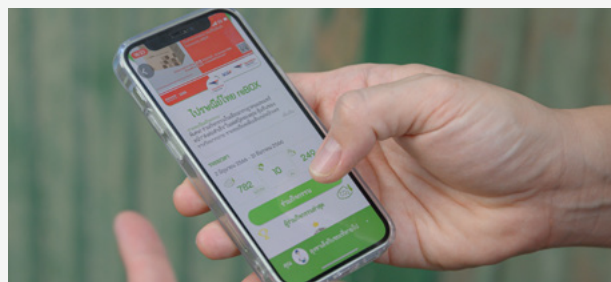


Program: Customized Venture Building

The Green2Get app, developed by local Thai company Green2Get, uses barcode scanning to help users segregate their waste at source by providing them with key information on waste materials and how and where to recycle them.

The app was developed with initial funding from the Capital Management and Administrative Unit for Enhancement of Thailand's Competitiveness, and received subsequent support from the Pollution Control Department, which promoted the app as a central platform for recycling shops. While Green2Get has been able to build a strong nationwide network of the recycling industry over the course of 5+ years since launch, the app was largely functioning as an information tool for its users and Green2Get did not have the necessary resources to fulfill its vision for the app to play a more proactive role in improving recycling rates and driving a more circular economy for waste management in Thailand.

Thus, Green2Get sought to develop a digital marketplace platform that could facilitate efficient trading of waste materials among actors within the value chain. With two phases of customized venture building support from SecondMuse, Green2Get developed and launched Hero Recycle, a new app linked to Green2Get that (i) operates based on a matching system between customers and businesses, where users can post requests for materials and be matched accordingly to other users that can provide materials at the agreed requirements and price; and (ii) provides recycling companies enhanced access to waste material and quality feedstock supply, thereby improving efficiency in material sourcing and



eventually enabling growth of businesses that rely on having a steady and reliable feedstock supply.

The Hero Recycle app is already being positioned as a critical tool for driving circularity within the local waste management sector. Green2Get has since been engaged by key stakeholders such as the Thailand Pollution Control Department (PCD) and Saleng & Recycle Trader Association (SRTA) to provide a series of in-depth training sessions across five provinces to promote and encourage the use of Hero Recycle among their respective beneficiaries. To date, Hero Recycle has more than 850 approved Hero users in more than 3,700 locations in Thailand. And since the app's launch of its key suite of functions in August 2023, more than 20 transactions have been recorded via the Hero Selling function, involving purchases from 10 recycling companies and a total of more than 160 metric tons of recyclable material being exchanged.

Green2Get's success with Hero Recycle has been further validated by their recent selection as one of ten finalists in PepsiCo's inaugural 2023 Asia Pacific Greenhouse Accelerator Program - Sustainability Edition, and a growing interest from external investors for potential scale up.

WITHIN 4 MONTHS:

More than **850** approved Hero users
across **3,700** locations

160 metric tons of recyclable material
traded

Case Study 02



Program: Customized Venture Building

Blue Ocean Plastic Recycling (BOP) is a social business operating on the island of Koh Samui that works with local communities and businesses, foundations, and international companies to promote a circular economy for plastics, with transparency and traceability as its core values.

BOP's model for reclaiming, recycling and upcycling ocean-bound plastics is inspired by their sister organization, Ranong Recycle for Environment Social Enterprise, and is being implemented to address the geography, supply chain, and local community needs of Koh Samui, in addition to creating sustainable work for independent waste collectors on the island.

SecondMuse's customized support was focused on helping BOP establish the systems and infrastructure necessary for improving collection-for-recycling rates on Koh Samui, especially for low-value plastic (LVP) waste. Starting from scratch, BOP has since established three fully operational waste banks, which are led and managed by local community leaders and supported by a network of waste collectors from their respective communities. Each waste bank has also been equipped with washing lines to accommodate collection of LVP waste, and BOP has started testing an incentive model — the first-of-its-kind on Koh Samui — specifically to spur collection of LVP that is usually ignored by waste collectors. Further, BOP has partnered with a local contractor and innovator, K.Prapan, who utilizes plastic waste (including LVP) as raw material to produce eco-bricks, and has supported K.Prapan's facility with infrastructure upgrades that will potentially double production capacity (to 100 bricks/day). As a result of its focused efforts, BOP managed to collect and divert approximately nine metric tons of plastic waste from landfill over six months, and recently secured and successfully delivered their first major order of eco-



bricks (1,600 pieces) from CP All Foundation, which has used the bricks to build a *sepak takraw* court at a local school. BOP is in discussion with CP All Foundation and other parties about future orders, and is also in the process of submitting their eco-bricks for additional quality testing by the National Metals and Materials Technology Center (MTEC).

At the same time, BOP's team of field coordinators have thus far recruited and trained approximately 23 waste collectors — two-thirds of whom are women — from three different communities, and have begun testing incentive schemes similar to plastic credits by paying collectors above-market rates for their recyclable plastic material to gauge effectiveness in the context of Koh Samui. BOP's ultimate goal is to establish fully-traceable plastic recycling supply chains on the island in order to gain Ocean-Bound Plastic certification, and have thus been establishing key local partnerships to create transparent market linkages. As a result of their efforts, BOP recently secured a ~\$150,000 USD grant from WWF to expand their work on Koh Samui and Surat Thani, mainly focused on building large-scale material recovery facilities and running educational programs.

Approximately

23 waste collectors
recruited and trained

2/3
female collectors

\$150,000 USD
grant secured from WWF

Case Study 03



Program: The SUP Challenge + Extension

Nano Onions is an early-stage startup that focuses on utilizing bio-based materials to create alternatives to single-use plastic products. Nano Onions joined the SUP Challenge with a biodegradable straw prototype made out of agricultural waste from rice harvesting, ready to be piloted but with no secured clients for testing.

With the program's support, Nano Onions launched its first pilot with Blackheath Bistro, a small cafe in the outskirts of Bangkok, and subsequently expanded to four other cafes through Blackheath Bistro's connections in the market. Nano Onions managed to produce and supply more than 10,000 straws to their five pilot partners for free testing, which was a validation of their capabilities to implement their ideas in a real-life setting.



With increased knowledge of the bioplastics industry and misconceptions around the biodegradability and compostability claims of existing products in the market, Nano Onions was inspired to create a new seaweed-based product that would be 100% home- and marine-compostable and certified to globally-accepted standards, in an effort to address the current gap of high-quality SUP alternatives within the Thai market. With customized follow-up support from



SecondMuse, Nano Onions established a self-cultivated *Ulva Rigida* seaweed farm in Chantaburi province to provide a sustainable source of raw material for its product, in collaboration with a local social enterprise and the local Department of Fisheries that provides a free supply of seaweed spores in addition to R&D support. The farm's current capacity is 200 kilograms of raw seaweed material per cycle (every three weeks), and after several rounds of lab tests with their university R&D partner, the team has finally achieved a stable seaweed-based resin formulation that is structurally strong enough for injection molding and bears similar properties to raw material used to produce paper straws currently available in the market.

Nano Onions' venture is currently the first of its kind in Thailand, and its success in producing its latest resin formulation positions them to produce a first batch of drinking straw prototypes, which the team expects to achieve by the first quarter of 2024. As further validation of its work, Nano Onions recently secured additional financial assistance of approximately \$15,000 USD from a Hong Kong-based innovation grant fund in November 2023, and is also in the process of submitting an application for a grant from the National Innovation Agency (NIA) of Thailand.

More than
10,000
straws supplied to
five pilot partners

Current capacity of
200kg
of raw seaweed
material per cycle

Approximately
\$15,000 USD
of additional financial assistance secured

Case Study 04



Program: Seedstars WMRA,
The SUP Challenge + Extension

Micro Green Tech (MGT) and Micro Vending Tech (MVT), owned and operated by the same founders, are tech innovation companies that specialize in the design, manufacturing and operation of a diverse range of vending machines for various applications.

With a strong commitment to sustainability and environmental stewardship, the founders' vision is to leverage their technology and technical capacities to create innovative solutions to tackle plastic waste management and pollution problems, with a primary focus on outskirts areas and communities in Thailand where waste management collection systems are less mature.

With extensive support from both the Seedstars WMRA Phase 2 program and the SUP Challenge customized venture building extension, MGT and MVT:

- Successfully developed the first working prototype of their Reverse Vending Machine (RVM) for PET bottle and aluminum can collection, which was officially launched during a community running event in collaboration with the Nakhon Pathom municipal government. Since then, the RVM has undergone some minor upgrades and has been pilot tested at different locations within the municipality to gauge effectiveness and community reception in different settings. With this experience, the company has been able to design two different versions of the RVM to fulfill different needs, each fitted with AI learning technology that is able to detect and accept a wide range of PET bottle barcodes commonly disposed of by the local community.
- Produced 10 units of a new and improved refill vending machine that can dispense a variety of cleaning liquids, with the aim of replacing the use and disposal of single-use sachets and plastic bottles. The units are currently installed



at 10 different premises (a mix of laundromats, neighborhood marts, restaurants, etc.) within the Nakhon Pathom municipality and are linked to MVT's web server where the team is able to track and monitor key information and data remotely. In the month of November 2023 alone, the six units placed at laundromats have dispensed a total amount of laundry detergent and softener equivalent to 452 pieces of 20ml individual sachets, which are usually made of low-value, multilayer packaging and disposed upon use.

To further incentivize use of these services, both the RVM and refill vending machines are linked to the company's "universe" of vending machine services within Nakhon Pathom, where earned user points can be used to purchase any other amenities and/or services offered by the company such as phone credits, drinks, and washing machine services.

On the back of their successful pilots, both MGT and MVT managed to secure significant business opportunities. MGT signed an MoU with the Nakhon Pathom municipal government to produce and install 30-50 units of their RVM (contingent upon availability of investment), and MVT is in the process of signing an MoU with local laundromat chain Toki, where MVT's refill machine will be included as part of Toki's standard franchise setup to replace the default single-use sachet vending machines. Toki currently has 75 branches across the country and is planning to double that amount through franchising in 2024.

Produced and
installed

10

new units of refill
vending machines

MoU signed

with key stakeholder
(Nakhon Pathom
municipal government)

Case Study 05

UNION J. PLUS

Program: Thailand SME Program for Plastics Circularity

Union J. Plus (UJP) is an established large-scale recycler of PCR and PIR plastic waste in Thailand with an existing processing capacity of approximately 1,000 metric tons per month, mainly for PP, HDPE, LDPE and LLDPE.

Founded in 2001, UJP's overarching aim as a company is to provide high-quality plastic compound resins utilizing recycled plastic waste to meet a growing global demand, especially among large corporations and brands. The company currently has a solid client base of approximately 150 active customers, 38% of which are recycled resin customers. Despite their stability and stature within the industry, UJP has not been spared from the uncertainties of a challenging global economic climate, and joined the SME program with a keenness to learn more about the relevance of circular economy and sustainability to their business and to gain exposure to new ideas and trends.



In Phase 2 of the program, UJP streamlined their priorities to focus on three areas: (i) exploring new customer segments and business opportunities; (ii) improving product quality to align with global market demands; and (iii) improving internal company processes and administration in preparation for potential investment from external investors. UJP made significant progress on all fronts. They began development of a new LDPE plastic compound resin formulation using at least 30% of PCR PE material

in response to a growing demand from shrink film producers seeking to comply with European tax incentives, which require producers to use at least 30% recycled content in their products. They also worked closely with fellow cohort member BMP Chemicals as an industry partner to conduct feasibility tests of BMP's decolourization solution which, if successful, has the potential to significantly increase the quality and value of UJP's products in the market.



In addition, UJP [signed an MoU](#) in November 2023 with prominent local FMCG company Osotspa, in which UJP was designated as an official offtaker of Osotspa's plastic packaging waste which will be processed and recycled to produce new material for Osotspa's use. This partnership is especially significant as UJP's typical source of recycled material comes from large-scale aggregators and traditional junk shops, which makes this UJP's first foray into establishing a partnership driven by circular economy principles that will contribute towards Osotspa's sustainability goals and internal zero waste program. Thus, UJP's success in aligning and positioning their work from a sustainability angle helped unlock new potential business opportunities for the future, and their commitment to sustainability was further rewarded by a [strategic investment secured](#) from leading circular economy investment firm Circulate Capital in December 2023.

MoU signed

with local FMCG company Osotspa based on sustainability principles

Large strategic

investment secured

from Circulate Capital

Section 08

KEY LEARNINGS AND REFLECTIONS

The diversity of programs and stakeholders engaged over the course of the ECCA-SecondMuse partnership generated a variety of insights from a programmatic perspective as well as on the conditions, needs and opportunities of the Thailand waste management and recycling ecosystem. Here we synthesize key learnings from different aspects and phases of the ECCA Thailand Program:

Programmatic Insights



Tailored Engagement Strategies

Just as different companies and ventures have different needs for support, SecondMuse found that different industry segments required different approaches to engagement to generate interest in program participation. For example, SecondMuse struggled to garner response from established local SMEs within the industry with a ‘Call for Applications’, even though this is a commonly-used approach for startups and entrepreneurs who are more accustomed to applying and pitching to be part of entrepreneur-support initiatives. As a result, SecondMuse pivoted its engagement strategy to leverage existing connections and information about SMEs from one of its local partners to reach out to companies directly. Relevant to this learning is the issue of language barrier which was more prominent among the SME segment due to the profile of companies and owners/key points of contact, who were more comfortable participating and engaging in the Thai language. Sessions conducted in the local language often yielded richer discussions and exchanges between participants. To that end, offering live translation or a hybrid model (with workshops

delivered in English and group discussions in the local language) could help achieve the balance between local participation and connection to the international circular economy community.



Connections Matter

A recurring comment that SecondMuse has received from participants is that the programs have given them the opportunity to be connected to stakeholders across the plastic value chain that they typically would not have engaged with through their business-as-usual operations or did not even know existed in the first place. Participants have also generally appreciated the access to relevant and up-to-date information about the industry gained through these established connections and continued interaction with SecondMuse’s work. This feedback has reaffirmed that targeted, intentional network-building and stakeholder convening can still add value to the local Thailand ecosystem. In addition, participants also appreciated the international perspective that SecondMuse’s programs included, which gave them fresh insights for their own businesses.



Cohort Model vs. Customized Support

Larger cohort-based programs such as Phase 1 for the WMR Academy and SME Scale Up program have been effective in expanding SecondMuse's network on the ground, engaging a wide and diverse range of actors within the ecosystem, and identifying companies that are best positioned to participate in and benefit from more in-depth support. However, the added value for individual companies seems smaller compared to programs with smaller cohorts (such as Phase 2 of the WMR Academy and SME Scale Up Program), where resources can be targeted more effectively to areas specific to the participants' respective growth needs. In addition, participants in projects with a longer time frame of support generally benefit exponentially, as it offers them the requisite time to make more substantial and meaningful progress. This is especially true for ventures that are running pilots to test proof of concept, which was evident from the SUP Challenge where ESOs were provided a strict timeline to complete sourcing, initiation and full completion of pilots, which gave the ventures only about 30 days of actual implementation with their F&B partners. While the program yielded some encouraging results, having more time would have been valuable in providing more informed validation of the effectiveness of each solution. A longer program duration also gives technical support providers more time to establish a deeper understanding of the companies and ventures, which in turn sets the stage for a successful collaboration and minimizes risk of underperformance or lack of commitment to program objectives and/or agreed deliverables.



Tailored Tools for Startups and SMEs

The SME Development Framework developed for Phase 2 of the SME Scale Up Program was received differently by the companies in the cohort: some found it useful, while others found it not applicable to their business. This highlights the diversity between companies, as well as one of the major differences between startups and SMEs, where startups are usually more receptive to structured approaches to assessment and growth planning — a common practice among ESOs and incubator/accelerator programs. The challenge for

future programs focused on SMEs is to strike the right balance between creating content that feels relevant to the majority of participants but also creates space for customized support.



Infrastructure Investments

SecondMuse has seen that it is possible for companies and ventures to achieve immediate, measurable impact on plastic waste processing and landfill diversion, but the likelihood of seeing this impact is tied to the company's existing capacity and their ability to access sufficient funding to invest in infrastructure improvements. For example, under The Incubation Network's AEPW-funded Scale100(t) Program, Wongpanit Krabi was able to double their plastic waste processing capacity within six months, adding an additional volume of 150 MT per month, through the purchase and installation of equipment using a USD \$100,000 grant. Thus, programs looking for short-term impact must understand what is feasible based on the baseline capacity and the availability of resources to support all parts of the business, including its critical infrastructure. There may also be the opportunity to evolve one-off grant programs of this nature into a revolving grant/loan vehicle, where it is proven the initial grant will result in an increase in revenue for the recipient. The grant can be recycled using a patient loan structure, resulting in a far greater impact over time and giving grantmakers more bang for their buck.



Ecosystem Insights



A Positive Shift in Momentum in Thailand

The recent announcement by the Ministry of Public Health in 2023 on packaging regulations for selected cosmetics (specifically liquid body cleansers and shampoo) with regards to refill stations is a strong indication of the government's acknowledgement of the growing importance of refill model businesses and the impact it expects them to have on the consumer market. While there is still much room for improvement from a policy level to support the growth of single-use plastic alternatives and plastic waste reduction innovations, this new regulation, along with the upcoming enactment of the national Extended Producer Responsibility (EPR) policy in 2026/2027 and an ongoing push for sustainability-related initiatives by the incumbent Governor of Bangkok, provides innovators and solution providers in this field a favorable wave of momentum to ride on for the expansion of their work.



A New Era of Thai Entrepreneurship

SecondMuse's body of work with early-stage startups has shown the burgeoning nature of the country's entrepreneurship landscape, where we have seen an increasing number of Thai young adults demonstrating an entrepreneurial spirit and the courage to pursue

ambitions close to their hearts, despite still holding full-time jobs. Our team also observed that the next generation of Thai entrepreneurs exhibit a keen willingness and humility to embrace learning opportunities, as well as a acute awareness and sensitivity to relevant current affairs such as global trends, national policies, and local community initiatives. This has, more often than not, spurred accelerated growth and maturity in their work, by learning from the knowledge and experience of others and aligning themselves more strategically to contextual needs and opportunities at an earlier stage.



The Entrepreneurial Funding Gap

A large majority of startups we have worked with often lament the dearth of funding opportunities for early-stage entrepreneurs and innovators across all sectors to get their ideas off the ground or scale their solutions meaningfully beyond initial implementation. This has been especially challenging for passionate founders who emphasize impact over profit, including those with sustainability-related business ventures. Some startups find themselves stagnating despite successfully participating and completing several incubator programs, due to the lack of financial assistance or catalytic funding support to help get them to a scale large enough to be considered by external investment from venture capital providers, impact investors, etc. For some of our grantees, SecondMuse has been their only source of funding and will most likely be the reason for their continued sustainability and growth.



Section 09

FUTURE OUTLOOK & RECOMMENDATIONS

The ECCA Thailand Program has, for the past three years, contributed towards the strengthening of the country's plastic waste management and recycling industry. While the program has had success in supporting the growth of innovative solutions and facilitating cross-sector and multi-stakeholder collaboration towards building a more circular economy for plastics, there remain many gaps and challenges across all levels of the ecosystem for Thailand to address in order to achieve its ambitious goals under the Government's Roadmap for Plastic Waste Management 2018-2030³.

Under the Roadmap, Extended Producer Responsibility (EPR) was mentioned as a key policy instrument to drive the adoption of circular economy principles, particularly within the packaging industry. Currently, the Pollution Control Department is working with Mae Fah Luang University to undertake a law-drafting project on promoting a circular economy for packaging waste management, with EPR integrated as a fundamental mechanism. The draft act, along with its implementing regulations, will undergo an intensive stakeholder consultation process before submission to the Cabinet by 2024. Based on the timeline set in the Plastic Waste Management Action Plan Phase II (2023-2027), the act is expected to be enacted by 2026.

3. https://www.pcd.go.th/wp-content/uploads/2021/10/pcdnew-2021-10-19_08-59-54_995414.pdf



As EPR continues to gain traction for future implementation, SecondMuse collaborated with the Environmental Research Institute, Chulalongkorn University (ERIC) to investigate the potential market-level impact and implications of a national-level rollout of EPR on the Thailand plastics value chain, market and ecosystem, and identify critical areas of support required for the industry. Findings from this research exercise, along with insights generated from three years of on-the-ground programming, have identified several barriers to the development and effective implementation of EPR in Thailand, including:

BARRIERS TO THE DEVELOPMENT AND EFFECTIVE IMPLEMENTATION OF EPR IN THAILAND

1 Unrealized potential of material recovery due to low rates of waste segregation and separation at source.

1

In 2021, out of the 24.98 million metric tons of Municipal Solid Waste (MSW) generated in Thailand, an estimated 32% (7.89 million metric tons) was segregated at source and/or sorted at a disposal site for recycling, with the remaining 68% (17.09 million metric tons) being disposed. Further, of the waste disposed, only 54% was disposed of in technically acceptable facilities, with the rest being mismanaged through open dumping, open burning and/or incineration without air pollution control. An estimated 11% (2.76 million metric tons) of total MSW generation was made up of plastic waste, with only 18.5% (0.51 million metric tons) being recycled, 76% being landfilled and/or leaked into the environment and 5.5% being incinerated⁴.

2 Significant gap in installed processing capacity for plastic recycling within the country.

2

The current gap in recycling capacity for major plastic resins in Thailand is estimated to be 76% of total resins consumed⁶. This presents a challenge for the nation in accommodating an expected increase in demand for high-quality recycled plastic materials due to recent developments in the local regulatory landscape on recycled content for selected packaging products, most notably the Food and Drug Administration's (FDA) legislation in June 2022⁷ on the use of recycled plastics in food-contact packaging and containers.

3 Market-driven, non-funded recycling of plastic is only made possible by the low-wage services provided by the informal sector⁵.

3

The role of the informal waste sector remains critical in driving collection-for-recycling (CFR) rates; however, the wages provided to these workers are often not commensurate with the value of services they provide to the system. This has a negative impact on their livelihoods and the status and esteem associated with their work, and leads to a focus on collection of high-value recyclable packaging types only.

4 Lack of a comprehensive policy framework to address plastic waste pollution from both upstream and downstream perspectives.

4

While Thailand has been making strides on the policy front in support of a circular economy for plastics (driven by the national Roadmap on Plastic Waste Management 2018-2030), the robustness of the action plans can be further improved through more quantifiable target setting and stronger enforcement of penalties for non-compliance⁸. There is also room for improvement in building an enabling environment for the development and growth of upstream solutions, which have typically struggled to establish themselves within the market⁹.

4. Pollution Control Department (PCD) (2022). Thailand State of Pollution Report 2021. <https://www.pcd.go.th/publication/26626>

5. Ellen MacArthur Foundation (EMF) 2021. Extended Producer Responsibility: A Necessary Part of the Solution to Packaging Waste and Pollution. <https://emf.thirdlight.com/link/cp8djaebittk-xo55up/@/#id=3>

6. World Bank Group. 2021. Market Study for Thailand: Plastics Circularity Opportunities and Barriers. East Asia and Pacific Region Marine Plastics Series; © World Bank, Washington, DC. <https://openknowledge.worldbank.org/entities/publication/1b89de3d-97ed-5ad8-9cd4-3002169951d5>

7. SecondMuse & Environmental Research Institute Chulalongkorn University (ERIC) (2023). A Study on the Role of Extended Producer Responsibility for Plastics Circularity in Thailand. https://www.secondmuse.com/wp-content/uploads/2023/06/Report_Extended-Producer-Responsibility-in-Thailand.pdf

8. From research exercise with Environmental Research Institute Chulalongkorn University (ERIC) (2023)

9. The Incubation Network (2022). The SUP Challenge Market Insights Report (2022). https://www.incubationnetwork.com/wp-content/uploads/2022/11/The-Incubation-Network-The-SUP-Challenge_Insights-Report.pdf

THREE CRITICAL PILLARS

In response to these barriers and challenges, SecondMuse has identified three critical pillars for accelerating readiness for an EPR-driven waste management and recycling climate:

Pillar 01

Enhancing institutional capacity and awareness of EPR among the public and private sector



Engaging with the Thailand Institute of Packaging and Recycling Management for Sustainable Development (TIPMSE) and Packaging Recovery Organisation Network Thailand, as well as relevant government agencies to support and refine EPR policies and mechanisms, and data collection and monitoring systems



Facilitating knowledge sharing and cross-country learning on EPR at a regional level through support of the ASEAN Regional Action Plan

Pillar 02

Strengthening enabling environment for the growth of upstream and downstream solutions



Building improved supply chains and strategic partnerships among solution providers, brand owners and communities to facilitate business growth and provide opportunities for piloting, testing and scaling of gender-sensitive and inclusive solutions



Connecting businesses and ideas with research institutes and universities to drive R&D and innovation, as well as with solutions designed for circularity such as carbon footprint data management tools, carbon credit exchange platforms, and industry standards and certification for waste management and recycling, where applicable

Pillar 03

Increasing investment and facilitating access to funding across spectrum of ventures



Providing larger-scale flexible grants and tailored developmental assistance to high-potential MSMEs and/or organizations within both the formal and informal industry to spur catalytic growth that will be self-sustaining



Establishing a close network between venture capital providers and impact investors with businesses and MSMEs to encourage funding matches and open up more funding opportunities

Section 10

CONCLUSION

SecondMuse Foundation and SecondMuse express profound gratitude to ECCA Family Foundation for supporting this program over a period of three years, as well as to the multitude of stakeholders, partners, and participants that engaged in the work.

Together, we hope to have made a positive contribution to the continued growth and acceleration of Thailand's response to the issue of plastic pollution and leakage. While the challenges are great, we are encouraged by the spirit of innovation and entrepreneurialism across the country that is focused on addressing these issues, and a policy framework that is encouraging movement towards a more circular economy.

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