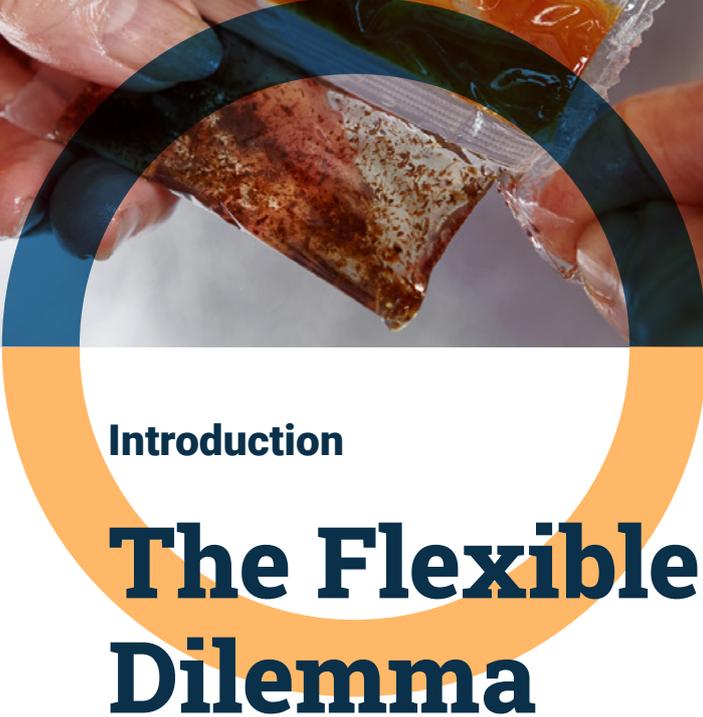




The
Incubation
Network



2022 Market Insights Report
Future of Flexibles



Introduction

The Flexibles Dilemma

Managing flexible plastic packaging presents a formidable challenge in the fight against ocean plastic.

Materials like polyethylene and polypropylene are used in products like plastic bags and food wrappers, which are the second- and third-most common type of ocean plastic. They are light-weight, low-density, and low-cost, which makes them an optimal packaging option for many consumer goods, including products that target consumers at different points of the income scale: for example, small single-use sachets of personal care products and cooking staples are favored by low-income consumers for their affordability and convenience¹; while consumer-packaged goods like cosmetics and prepared foods appeal to the growing middle-class with disposable income and active lifestyles.

Despite their high use-value in consumer-facing markets, for various reasons flexible plastics are more challenging to extract value from and extend the life of, when compared to other common types of plastic in the recycling value chain. They are often co-mingled with other types of recyclables and non-recyclables, which presents a sorting challenge, especially for the collectors that are at the critical frontline of the recovery of plastic waste. These

materials also have lower density and are lighter-weight than other common plastics like PET, which makes them less valuable to collectors who are paid by weight. Also, multi-layer plastics (MLP), which are used for sachets, cannot be recycled by traditional mechanical recycling technology and are more commonly downgraded into low-value end uses, such as construction boards, roads and fuel.

The magnitude of the flexible plastics challenge and its contradictions require a toolbox of solutions. As with all plastics, solutions are needed that address the systemic barriers to reducing plastic waste: interventions at the consumption, collection and sortation points of the value chain, including infrastructure investments and behavior change that are necessary to reduce plastic use and increase recycling rates. But, solutions also need to re-think and re-envision the materials, technologies and processes that underlie the linear flexible plastic economy, by developing alternative materials, new business models and circular supply chains for flexible plastics and the products they are used for.

¹ Liamson, Catherine, et al. 2020. *Global Alliance for Alternatives to Incineration. Sachet Economy: Big Problems in Small Packages*. Accessed at https://www.no-burn.org/wp-content/uploads/Sachet-Economy_final.pdf

Global Innovation Challenge: Future of Flexibles

Overview

In 2021, the Global Innovation Challenge: Future of Flexibles by The Incubation Network invited startups, companies, designers, and institutions from around the globe to develop better solutions, including packaging alternatives, for hard-to-recycle flexible plastics and their relevant value chains across South and Southeast Asia (SSEA). Identifying solutions appropriate for SSEA is of paramount importance in order to address ocean plastic pollution. Asia is by a large margin the fastest growing

market for flexible packaging, with over 42 percent of the global market share², and also responsible for 82 percent of the plastic pollution in the world's oceans.³

Through a multi-stakeholder consultation process, the challenge identified **two broad categories of solutions**. Specifically, we invited applications from startups and small- and medium-sized enterprises (SMEs) with solutions that either:



RECYCLE flexible plastics through downstream innovations in collecting, sorting, and processing flexible plastics; or



RETHINK the materials, products, or business models related to flexible packaging.

Over the 12-week program, companies at two stages of maturity received a combination of mentorship, technical assistance, cash grants, access to strategic partnerships with companies and NGOs, and storytelling and digital marketing support, with different activities and workshops tailored to their growth stage. An incubation track focused on the needs of young startups eager to get their innovation off the ground; and an acceleration track addressed the distinct challenges of more mature startups and SMEs interested in expanding their footprint in South and Southeast Asia.

Based on The Incubation Network's experience, it is clear that the landscape is very diverse in terms of solutions. In addition, entrepreneurs are responding to the opportunity to have an impact in South and Southeast Asian markets, with solutions that are well suited to decentralized, less developed waste management and recycling systems here. The promise of such solutions brings hope. However, many are still in the very early stages of a concept or technology, and therefore delivering on the promise still remains a challenge. The future of flexibles is indeed before us.

² GA Circular, 2017, *Toward Circularity of Post-Consumer Flexible Packaging in Asia: Exploring Collecting and Recycling Solutions*, <http://www.goneadventurin.com/insights/flexibleplastics>.

³ Kang, Daniel, et al. Citi, 2018, *Rethinking Single-Use Plastics: Responding to a Sea Change in Consumer Behavior*, www.citibank.com/commercialbank/insights/assets/docs/2018/rethinking-single-use-plastics.pdf.

Global Innovation Challenge: Future of Flexibles

Impact

The challenge received **119 applicants** from startups from **30 different countries**; 60 percent of applicants proposed solutions that fell under the “**recycle**” category, and roughly the same share were from **female-led startups**.



Application received

119
Applications

30
Different countries

60%
of proposed solutions fell under the **recycle category**

60%
of proposed solutions came from **female-led startups**

Final Cohort



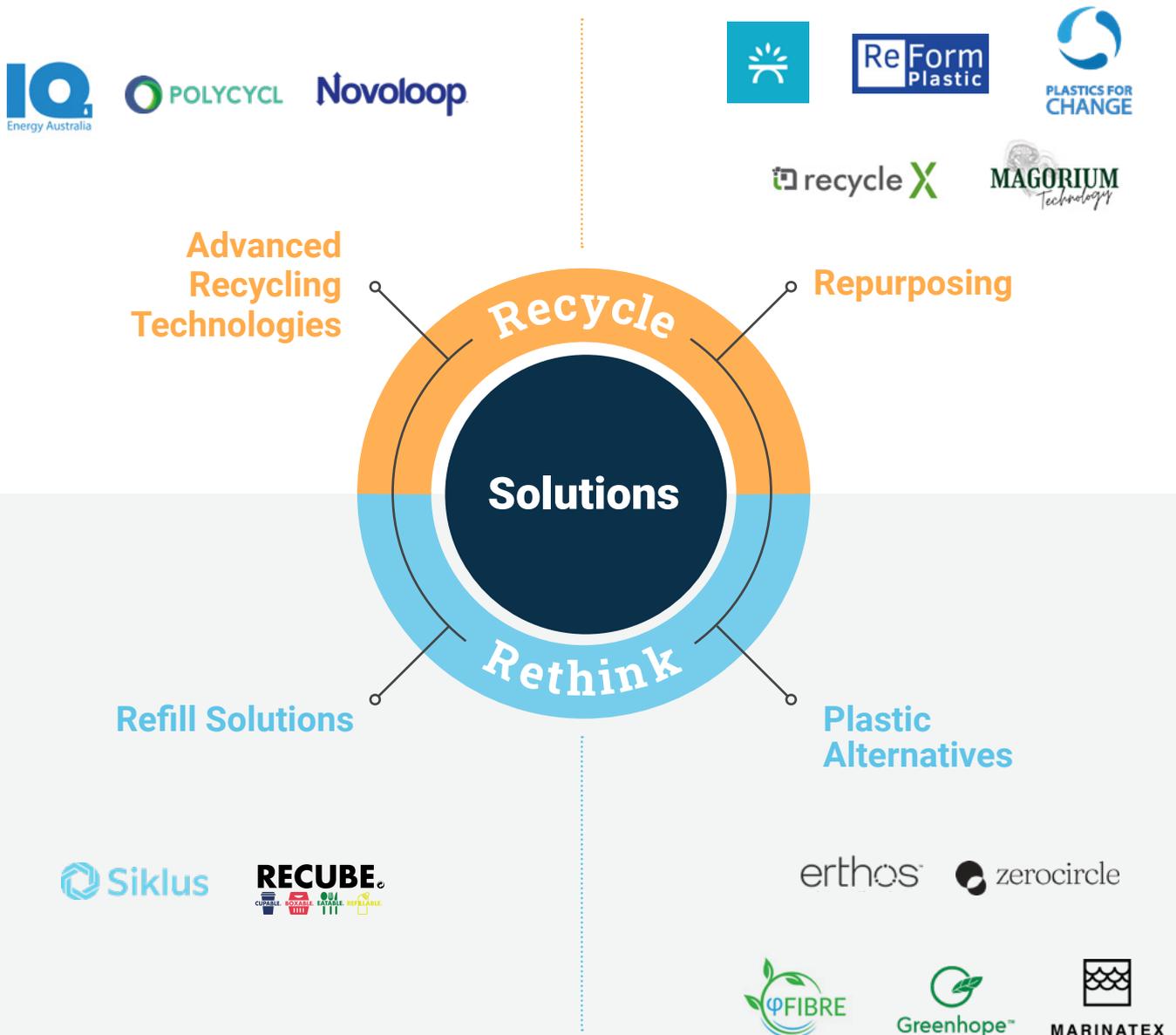
15 Startups in final cohort

8 Accelerated & **7** Incubated



Landscape of Solutions for Flexible Plastics

The Incubation Network’s analysis of the landscape identified four categories of solutions: **advanced recycling technologies**, and **repurposing** post-consumer flexible plastics, which enhance and expand the capacity of the existing mechanical recycling system to recycle the broad range of plastics contributing to ocean pollution, including flexibles; and **refill models** and **plastic alternatives** that rethink the basic inputs, outputs and delivery mechanisms for plastic consumption.



01

Advanced Recycling Technologies

Advanced recycling refers to a broad variety of technologies and processes used to purify and/or breakdown post-consumer plastic at the molecular level, creating an output that can be used to manufacture new products or reconstituted as virgin plastic.⁴ The solution holds great potential to address flexible plastic waste in ways that the current mechanical recycling system cannot, due to the diverse set of technologies that advanced recycling encompasses. Also, certain advanced recycling technologies can process commingled and contaminated plastic waste streams, making them well-suited to a region that is lacking adequate recycling infrastructure. In this way, advanced recycling can be a complement to mechanical recycling systems. While the processes and technologies are capital-intensive, they can produce higher-value products, including in some cases like-new plastics.

⁴Closed Loop Partners. 2021. *Transitioning to a Circular System for Plastics: Assessing Molecular Recycling Technologies in the United States and Canada*. Available for download at: <https://www.closedlooppartners.com/research/transitioning-to-a-circular-system-for-plastics-assessing-molecular-recycling-technologies-in-the-united-states-and-canada-2/>

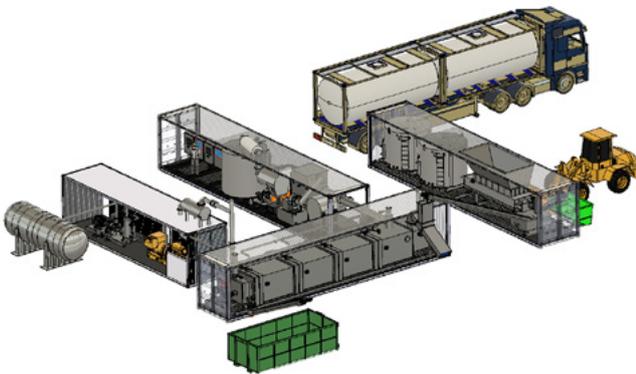


Image sourced from IQ Energy Australia



CASE STUDY



IQ Energy Australia is developing a modular, containerized, scalable advanced recycling solution that uses technology to sort and separate mixed plastics, and pyrolysis, a process that uses heat to break plastic down to its molecular level. Once broken down, the molecules can then be manufactured into new plastics, as well as other consumer and industrial products. The technology is manufactured off-site and does not require a connection to the energy grid. It can be easily installed at or near the site of waste collection or sortation, and as a complement to existing mechanical recycling infrastructure. Alternately, the technology's smaller scale makes it well-suited for smaller feedstock streams; until better collection and recovery of plastics is possible, there is a compelling case for solutions like IQ Energy's, rather than conventional commercial scale facilities that can require much larger, more consistent feedstock streams. The process is automated, so it can be controlled and monitored remotely and deployed in remote locations, as well as in urban areas. The low-emissions process has several byproducts, including heat, water and ash, which have applications in the manufacturing process itself, as well as by other industries and agriculture; this creates the potential for multiple revenue streams.



02

Repurposing

For other types of plastics, like PET, the gold standard for recycling is an identical product: for example, bottle-to-bottle manufacturing. While the demand for recycled packaging continues to grow, along with the need for products and solutions to meet that demand, there are also opportunities to develop new products and applications from flexible plastics. There are several examples of companies using post-consumer flexibles to create new products or inputs for existing products. Most of the potential applications apply to the construction industry, where recycled products can provide an environmentally-friendly alternative to raw materials gained through extractive and polluting processes, as well as generate other positive social impact: for example, creating a low-cost material for affordable housing production.

As more end-use products and applications are developed, it is clear that many can be price competitive as alternatives to virgin products; some have even higher margins. In some cases, however, the environmental impacts of these newer end uses are not always unknown, and individual products need additional research or testing to determine if there is the potential for leaching or off-gassing that can pose a health risk or result in material degradation. Where they can deliver on environmental and price performance, models that repurpose plastics into new end-uses present a formidable opportunity to broaden the market for post-consumer recycled materials and bring more sectors into an emerging circular economy.



CASE STUDY



Plastics for Change is using a digital sourcing platform for high-quality recycled plastic to support the development and management of a supply chain for ethically-sourced recycled plastic, with the mission of improving the livelihoods of waste collectors. As part of this effort, the company is also working to build the market for recycled plastics by creating new applications and uses for low-value recycled plastics. With partners, the company has developed recycled sheet lumber from 100% recycled multi-layer packaging and low-density polyethylene. This product is replacing traditional bricks and cement in the construction of low-cost housing and classrooms in waste collector communities in South India, which also furthers the company’s efforts to alleviate poverty for this population. The company is currently building 15 homes, each of which uses 1.5 metric tonnes of single-use plastic. These houses will provide shelter for 98 people.



03

Refill Solutions

Short-term solutions, while essential for creating more avenues to effectively and responsibly manage existing flexible plastics, do not pose the same impact as solutions designed for systemic evolution in the long run. Although short-term solutions will deal with the waste currently being generated, in the long run, solutions must include more transformational technologies, processes and infrastructure. Refill solutions have the potential to reduce consumer reliance on plastic, and advance the shifts in consumer behavior that are necessary for a plastic-free future. They can address both the consumer need for convenience and low prices, while also helping companies remain competitive in a shifting regulatory consumer environment. As South and Southeast Asian countries adopt Extended Producer Responsibility (EPR) regulations, wherein producers of plastic products are required to facilitate collection and recycling of their products post-consumer use, brands are seeking ways to reduce the amount of single use packaging they are producing in key markets. Moreover, Asian consumers are increasingly demanding and willing to pay more for environmentally-friendly products. A recent survey by McKinsey & Company showed that consumers from China, India and Indonesia had the highest rates of willingness to pay of all countries surveyed: upwards of 70 percent of consumers surveyed said they would pay “a little” or “a lot” more for a sustainable option.⁵

Refill solutions are a business model innovation that can help companies minimize the need for post-consumer collection while also seizing on the consumer appetite for convenience and environmentally-friendly goods and services. The solution reduces the demand for virgin plastic packaging by enabling consumers to refill their own containers and give consumers control over quantity; this can also be a way of minimizing costs for low-income consumers who rely on sachets for their convenience and low prices. Best-in-class models also involve an element of convenience by bringing refills to the consumer, rather than putting the burden on the consumer to seek out refills. Refill solutions companies need access to and partnerships with brands that offer the products to be refilled, who can also provide support with marketing refills to existing and potential customers; these partnerships could help establish credibility with consumers for the refill solutions.

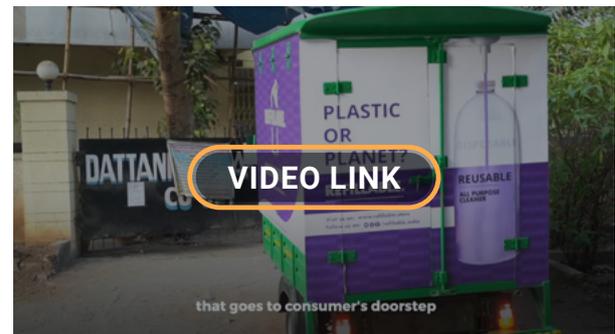


CASE STUDY



Refillable*, an Indian company, has developed a mobile refill vehicle which delivers homecare products to consumers at their doorstep. The goal is to eliminate any single-use packaging by delivering homecare products in refillable containers, and then providing convenient refill services. Consumers select the amount of liquid they require and only pay for how much they consume, and the company’s pricing model enables low-income consumers to access high-quality products because the pricing is based on bulk purchases. The company uses a tech platform through which consumers can order their refills and receive rewards for their purchases.

**Formerly operating as Recube*

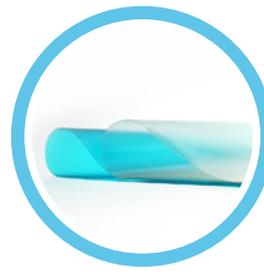


⁵Feber, David, et. al. 2021. *Sustainability in packaging: Consumer views in emerging Asia* Retrieved from: <https://www.mckinsey.com/industries/paper-forest-products-and-packaging/our-insights/sustainability-in-packaging-consumer-views-in-emerging-asia>

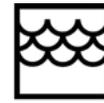
04

Material Solutions and Plastic Alternatives

Material solutions offer the exciting possibility of bypassing the plastics supply chain altogether, thereby contributing to plastics reductions goals and helping to advance a plastics-free future. Reducing the demand for flexible plastics requires alternative materials that can offer the same qualities that flexibles are known for – such as their light weight and effectiveness at keeping products fresh – while also being designed for circularity or end-of-life solutions. Mono-material products would be more easily recycled than multi-layer plastic, while use of biomaterials could result in more compostable and biodegradable packaging. The region's rich agricultural and coastal economies create opportunities to connect to local value chains for bioproducts or byproducts. Material innovation and product redesign must take into account the need for simultaneous growth in traditional recycling infrastructure and composting to process new materials, as well as South and Southeast Asia's high levels of heat and humidity which present an additional challenge for product performance.

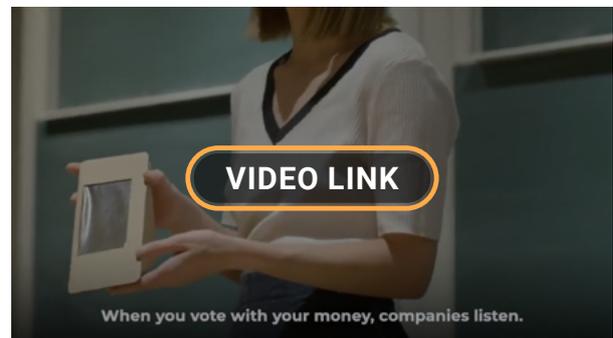


CASE STUDY

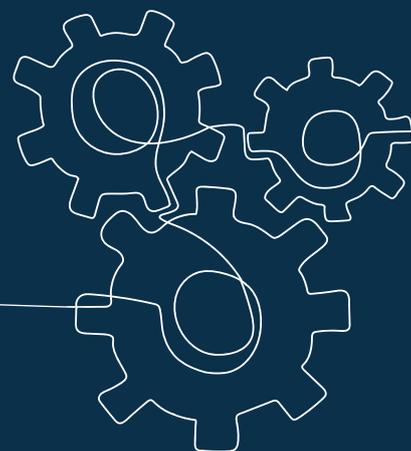


MARINATEX

MarinaTex is a new material developed as an alternative to translucent plastic film used for shopping bags and as windows in packaging and envelopes. The product, currently at prototype phase, is made from proteins derived from fish waste and agar from algae, both common materials found in Southeast Asia's coastal communities. This solution adds value to two supply chains, by taking from one waste-producing sector (fish processing) to simultaneously reduce waste in the plastics value chain. This new material can biodegrade in 4-6 weeks in home composting systems, does not leach harmful chemicals because it is derived from biological materials, and has a higher tensile strength than LDPE at the same thickness. MarinaTex is currently participating in the EIT Food Seedbed Programme, a 6-month accelerator that provides companies with support around commercialization and industry connections.



Needs



The potential solutions to the flexible plastic challenge are diverse, as are the companies advancing them. Still, we have identified a common set of needs for companies in this space, though the nature of the needs differs by solution type and company stage. These are the top needs identified amongst the Global Innovation Challenge: Future of Flexibles cohort.

Strategic Partnerships

Companies at both the incubation and acceleration phase need support building partnerships with manufacturers and brands. Incubation-stage companies need partners to help hone their business models by exploring potential models for production and potential revenue streams; later stage companies ready for acceleration are looking for manufacturers and brands to help them operationalize and scale their businesses, including as co-manufacturing partners, customers and by helping publicize their products and solutions. In addition, these operating companies need to connect with actors at different parts of the recycling value chain, including waste management and petrochemical companies.

Early Stage Financing and Investment Readiness

Companies at both stages have largely bootstrapped their businesses to date, with entrepreneur contributions, friends and family support and some grant funding. Incubator companies need help understanding the different types of capital available - particularly non-dilutive options - as well as support with valuation. Some of these companies also need support with refining their business models, as a step toward investment readiness. Acceleration-stage companies need help preparing for the due diligence phase and determining the right type of capital for their needs, as well as connections to value-aligned investors for small early funding rounds. Generally, start-ups in this space have identified a need for more risk-tolerant capital sources that can help them test their solutions, iterate and scale.

Product Development

At the incubation stage, companies need input on the technical specifications of their materials, some of which are still at the prototype phase, yet to be commercialized. Companies at the acceleration stage have materials that are more developed, but they still need to test their products to ensure compliance with regulatory environments and market needs, identify additional end-uses, and further refine technical specifications.

Market Entry and Insights

For companies looking to enter or expand in South and Southeast Asian markets, management teams need insight into local conditions, including the waste management landscape, the regulatory environment, the constellation of stakeholders involved in single-use plastic reduction, and specific use cases for their solutions. The need for market entry support is connected to the needs for strategic partnership and product development support: partners can provide the insight to inform product development and refinement to meet local needs and conditions, and can also be tactical advisors or collaborators on actual expansion into new geographies.

What challenges are companies at different stages facing?

CHALLENGES	Incubate	Accelerate
Refill	Refill companies need support with business model development, including pricing, franchise models. One key way that they can get the support needed is by securing a corporate partnership to run short-term trials or pilots.	Refill companies are approaching the growth stage and require partners to not only give them access to product lines, but also to assist in distribution and marketing of their model. They also need support refining their business models as they prepare for financing, and need help developing their strategies for growth and expansion into new markets.
Advanced Recycling		Advanced recycling companies are typically more mature, and need access to early-stage CapEx financing (from \$2-10 million) to help them establish and expand operations, and reliable feedstocks. They also need support understanding the business and regulatory climates in new markets that they are interested in entering.
Repurpose	Repurpose companies need more materials testing and research to validate the environmental and occupational safety and health of their products and processes and the net benefits of their production, as well as the market fit. They need low-risk, early-stage financing to support this part of the product development process. They also require partnerships and technology that will make their manufacturing processes more energy efficient and/or environmentally beneficial.	Repurpose companies that are on the acceleration track are usually focussed on advancing their business models, and finding new use cases for their solutions to grow in application.
Materials	Materials companies need connections to potential manufacturing partners who can help them produce at the scale they need as they commercialize their products.	

The way forward

The future of flexible plastic packaging requires a range of solutions - those that address the wasted single-use packaging being generated now, as well as those that will change how we consume in the long-run.

Furthermore, the acute challenge of a less-developed, decentralized system, as is typically found in South and Southeast Asia, must be addressed in the near-term. As local infrastructure evolves, solutions also must be flexible enough to adapt.

In order to make this future come to life, participants in this system must play a role to advance the most promising solutions. In particular:

01 Investors and capital providers

Non-dilutive capital in early stages of innovation and development are needed. **Private investors and capital providers should seek opportunities to invest in early stage technologies** - especially for solutions that repurpose existing or create new materials - **to help refine and optimize** for the local context and waste streams, as well as for environmental benefit, with the goal of accelerating their **path to commercialization**.

02

Corporate brands and producers

Entrepreneurs are key partners in identifying and testing new solutions for flexible plastic packaging. Brands and producers should:

- **Seek to engage in partnerships for pilots or testing**, and commit to supplier or offtaker commitments, when feasible.
- **Report and share what is being learned to encourage adoption and scale of solutions**, and publicly signal demand.

03 Entrepreneur Support Organizations (ESOs) and accelerators

Support to scale entrepreneur solutions and build capacity around startup teams are essential for the conversion from a minimal viable product into one that is ready for mainstream adoption. **ESOs and other accelerators can fulfill the role of aiding startups and entrepreneurs to progress from groundbreaking ideas to a viable business.**

04 Policymakers and government agencies

Public sources of capital can play a meaningful role in advancing new technologies and innovations toward better solutions for flexible packaging and a circular economy for plastics.

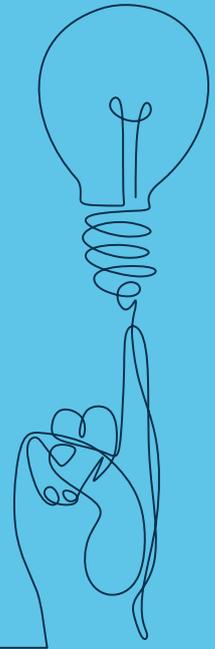
- **Policies, such as extended producer responsibility (EPR), can incentivize adoption of alternative solutions** that reduce the overall amount of single-use packaging entering waste streams.
- Public agencies can create grant programs or philanthropic and research support for newer technologies and processes. **They can also set standards and protocols for defining environmental benefits and impacts.**

With a robust pipeline of solutions, each of these actors can play a critical role in driving forward the future of flexibles. The Incubation Network looks forward to seeing a waste-free future become reality in the months and years ahead.

Interested in more content?

If you would like to receive updates about future insights reports from **The Incubation Network**, please register here. We invite you to join us and be a part of a global network of diverse partners and communities that will work together to prevent ocean plastic pollution.

REGISTER HERE →



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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