



DRIVING FOR CIRCULARITY: *Collaborating for Industry Impact*

Executive Summary

Circular economy is emerging as the theme of our times. It refers to decoupling growth from the consumption of finite resources – minimizing waste and maximizing the value of materials used. While this is closely linked to a sustainable way of living, achieving the transition to a circular economy from the current linear model requires the community efforts as a whole.

This report looks at circular economy in the context of the apparel industry. There is increasing momentum in achieving circularity in the apparel industry with brands adopting innovative solutions and favourable initiatives in place. However, barriers still exist. With reference to collaboration examples and case studies around the globe, we argue that it is important for the industry to collaborate together in order to drive for circularity. While Europe is leading the charge in this space, the same shall apply to Asia and our home city of Hong Kong.

Section 1 The State of Circular Fashion

We look at the current state of circular fashion in order to illustrate circular economy. Circular practices such as regenerative agriculture, recycling and retail-as-a-service models are highlighted with case studies of Patagonia and Levi's as well as the discussion of favourable initiatives in Europe.

Section 2 Key Challenges in Pursuing Circular Models

We discuss three major challenges in pursuing circular models – financial costs, infrastructure and socio-cultural acceptance. This highlights the importance of concerted efforts from the community to transition to a circular economy.

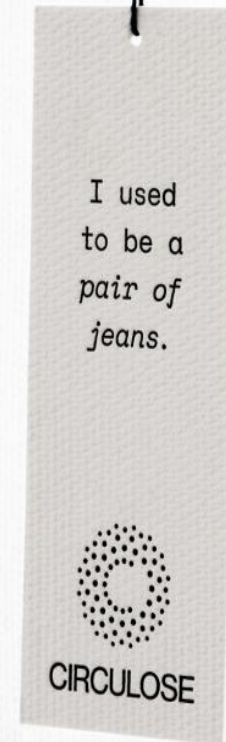
Section 3 Collaborating for Impact

We highlight the importance of collaborations in scaling innovations with case studies of two startups – Renewcell and Impossible Foods. We also look at common types of collaborations worldwide to achieve sustainability goals – task forces, innovation sourcing and pilots, as well as circular projects in Hong Kong.

[1] THE STATE OF CIRCULAR FASHION

[2] Key Challenges in Pursuing Circular Models

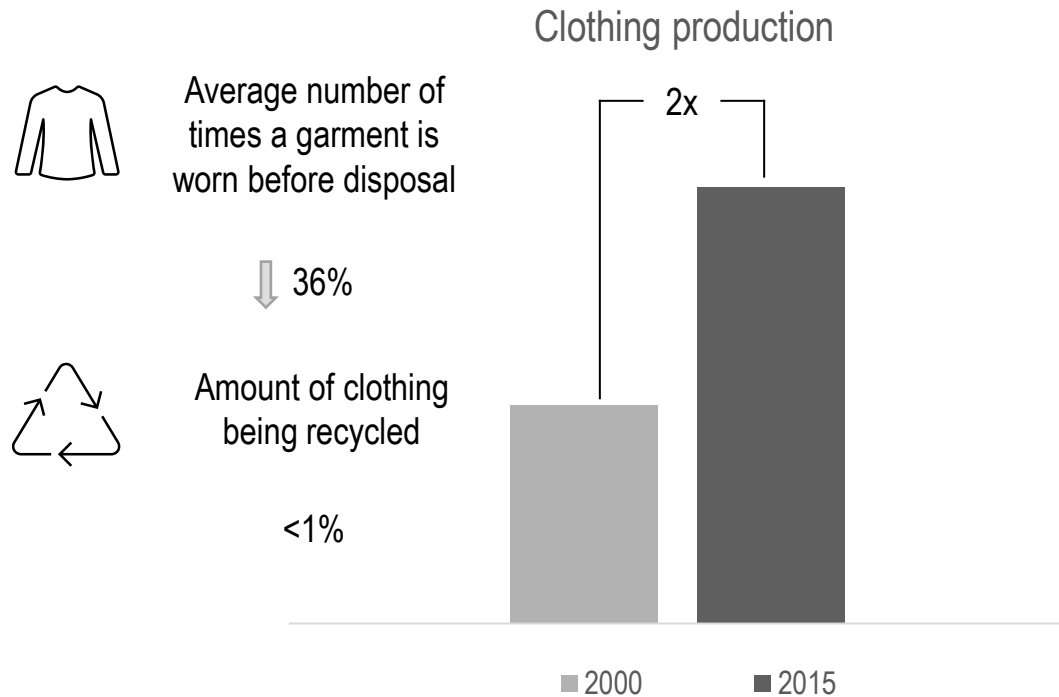
[3] Collaborating for Impact



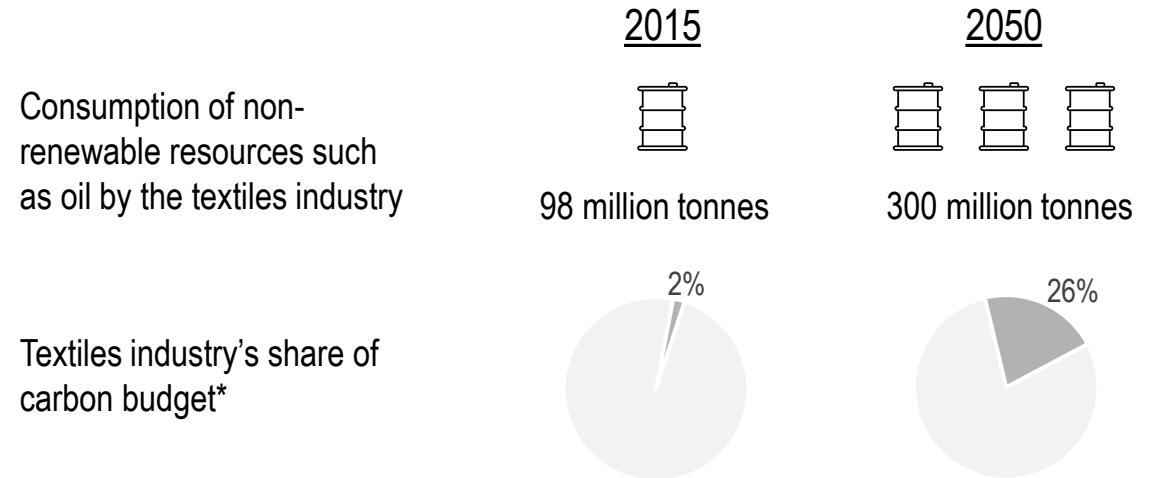
Take-make-dispose:

Current linear production can no longer fulfil economic and environmental interests simultaneously

Clothing demand continues to grow but most have ended up as waste in landfills over the past two decades



The take-make-dispose linear model could result in disastrous environmental impacts by 2050 at the current pace of production

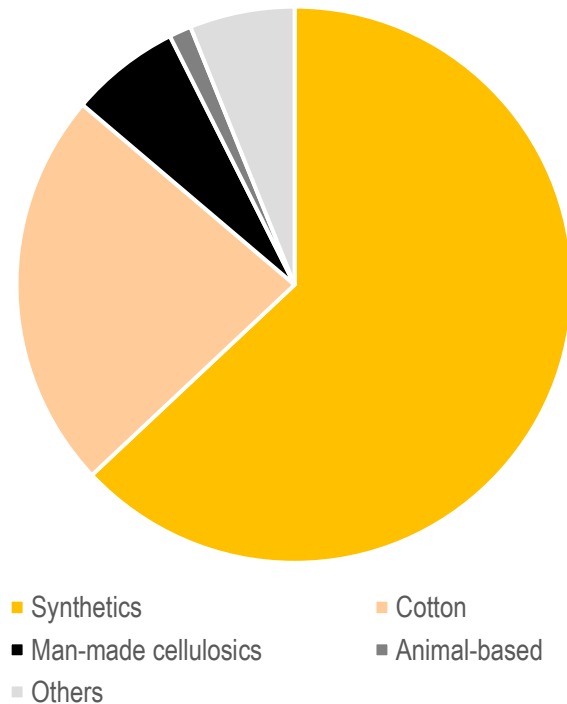


*Carbon budget refers to the amount of greenhouse gases that can be emitted against a given level of global warming. A higher percentage share implies more efforts are needed to maintain the 2°C Paris target - keeping the 2°C average global warming limit

Greater need to move away from the fossil fuel-based economy and explore wider choice of materials

Fossil fuel-based synthetics is currently the key fibre in apparel

Global Fibre Production by Fibre Type 2019



Diversifying the choice of fibre is important when considering their varying impacts



Synthetic fibre

- Synthetic fibres consist of polyester mostly and derive from non-renewable resources of oil and natural gas
- The production process involves significant energy and chemicals; highly relevant to the problem of climate change and microfibre pollution in the ocean



Natural fibre

- Natural fibres such as cotton tend to have significant impacts on land as they consume a lot of pesticides, fertilizers and water to grow



Man-made cellulosic fibre

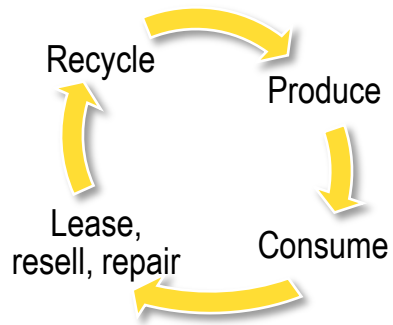
- Man-made cellulosic fibres such as viscose are usually extracted from wood using chemical solvents
- The production process can result in loss of endangered forests and environmental contamination if not managed properly

Towards a Circular Economy:

An environmentally-friendly, regenerative closed-loop production system

Circular Economy is a regenerative system that aims to maintain the value of materials and products as long as possible in order to minimize environmental impacts

Circular model



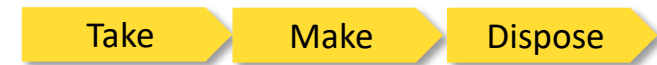
Towards renewable energy and resources

Biodegradable and safe when returning to nature

VS



Take-make-dispose linear model

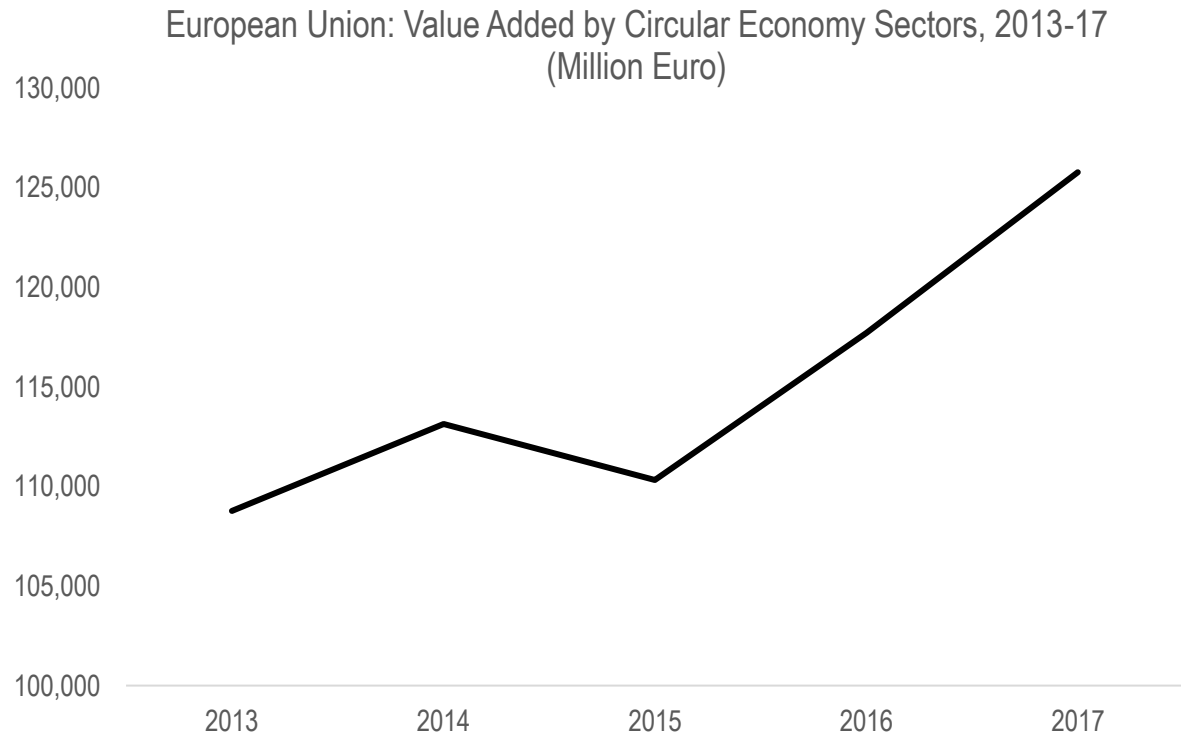


Fossil fuel-oriented

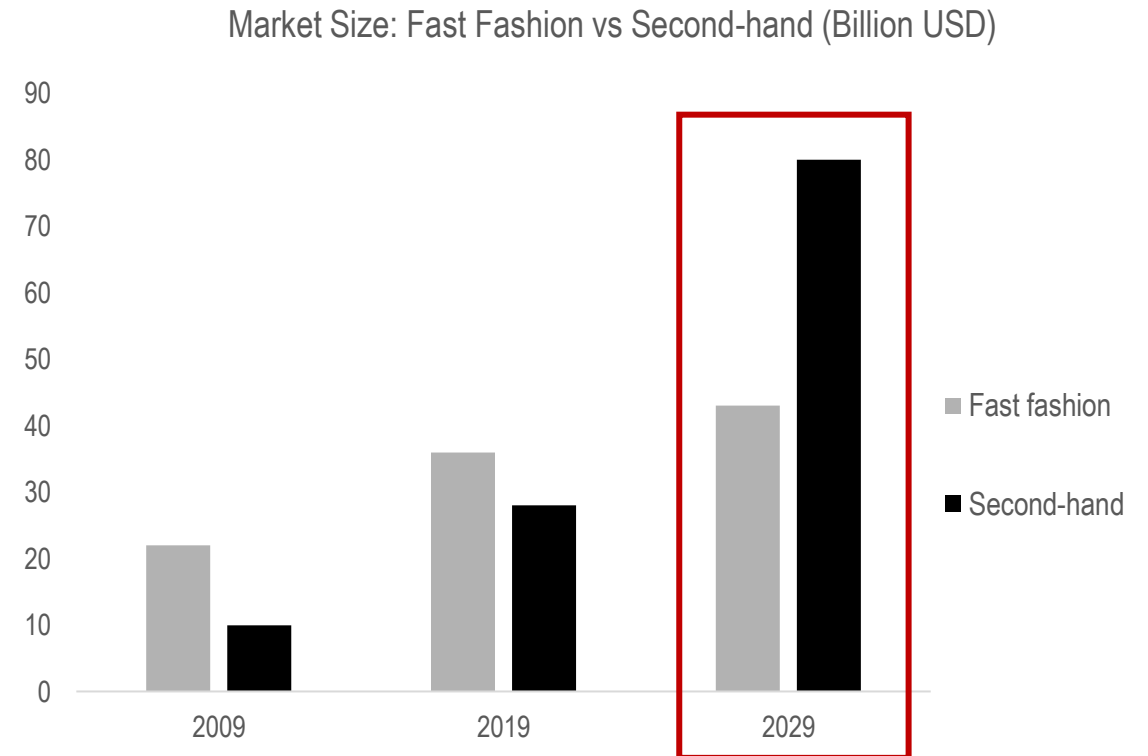
Harmful to natural ecosystems

Circular Economy has strong economic potential

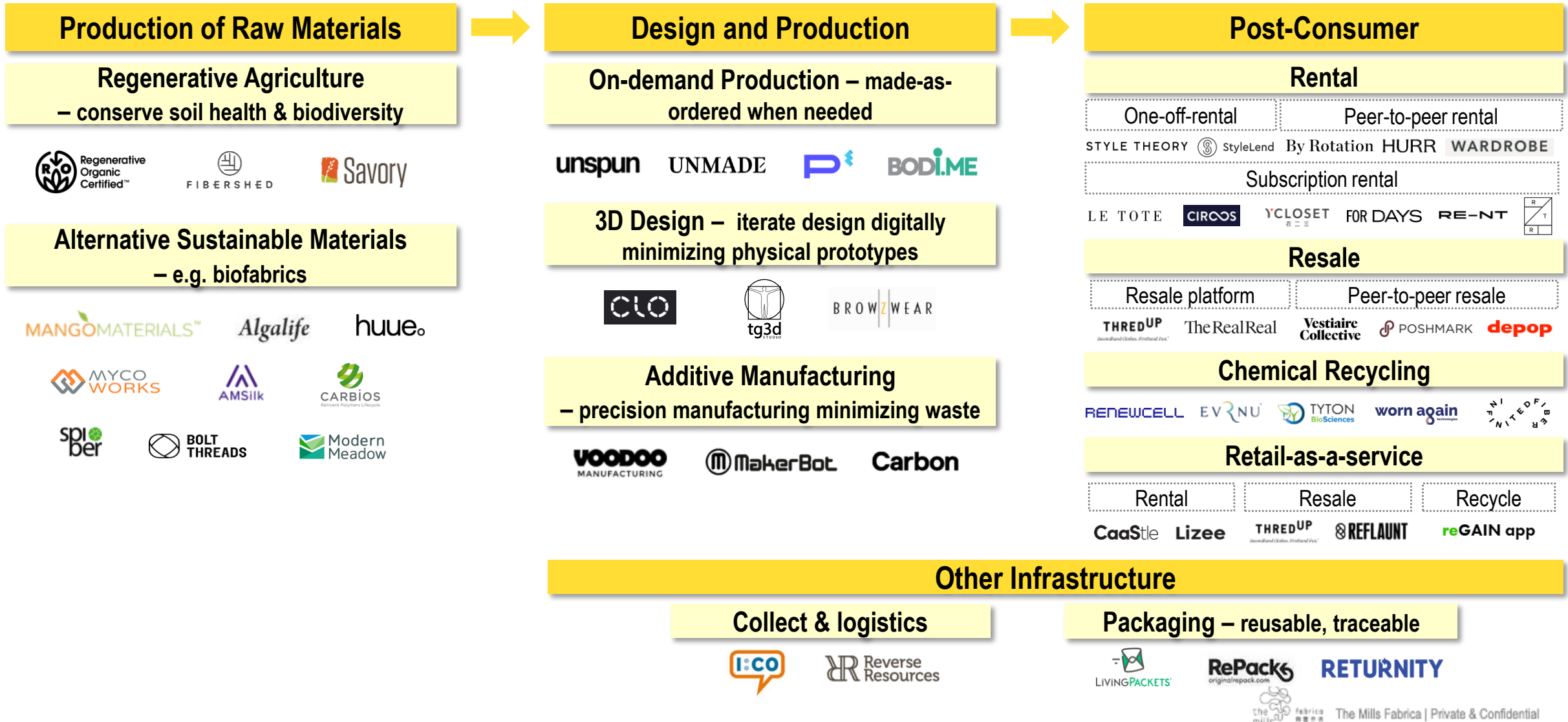
Circular economy sectors are driving the EU economy, with nearly 16% growth from 2013 to 2017






Circular fashion market estimated to be worth ~\$500B USD; second-hand fashion projected to be nearly twice the size of fast fashion by 2029



Economic potential would need to be unlocked by circularity innovations across the value chain...



..with emerging trends focusing on better technologies and new business models for circularity

| Shifting trends | | Implications | Example |
|-----------------|--|---|---|
| 1 | Platforms → Retail-as-a-service | Retail-as-a-service offers turnkey solutions to streamline the management of used garments e.g. collection of waste from consumers, warehousing, logistics, quality inspection |  <p>COS REFLAUNT</p> <p>COS taps into Reflaunt's infrastructure for resale services</p> |
| 2 | Mechanical recycling → Chemical recycling | Chemical recycling is able to retain the economic value of output compared to mechanical recycling. It is more effective in separating colour shades and fabric blends to provide quality materials for reuse |  <p>H&M RENEWCELL</p> <p>H&M launches a jacquard weave day dress made with Circulose, a chemically recycled fibre developed by Renewcell</p> |
| 3 | Lack of visibility → Tracing origin | Regenerative agriculture regulates environmental impacts from the start, conserving resources to a greater extent |  <p>Timberland Savory</p> <p>Timberland works with The Savory Institute to develop a regenerative leather supply chain</p> |

Innovation growth fuelled by brands committing to circular and sustainable practices



100% recycled or other sustainably-sourced materials by 2030



100% of its products to be designed for circularity by 2030



Carbon neutral by 2025

RALPH LAUREN

100% sustainably sourced key materials including cotton by 2025

TOMMY HILFIGER

Fully circular products by 2030



Reduce carbon footprint by 2030 with an absolute reduction of Scope 1 and 2 emissions by 65%



Only use recycled polyester in all adidas products across the business by 2024

BURBERRY

100% of cotton sourced more sustainably by 2022



Reduce GHG emissions by 40% by 2025

STELLA McCARTNEY

Only use recycled polyester by 2025

Case Study: Patagonia Embracing Circularity



Regenerative agriculture



Help establish the Regenerative Organic Certification to conserve soil health



Repair, Resale & Recycle



Trading in used Patagonia garments for store credits; the products will get repaired, resold or recycled

Worn Wear is Patagonia's hub for keeping gear in play.

Rental



Partner with renting platform Awayco to offer rental services for snow gear

Patagonia Introduces Snow Gear Rental Program with Awayco

Recycled polyester



REPREVE is a recycled polyester used in a wide range of Patagonia's fleece items

A Pioneer in Recycled Fleece

Case Study: Levi's Embracing Circularity

In-store repair services

In-store collection of post-consumer waste

Rental

Resale

Recycled cotton



GANNI

TROVE

RENEWCELL

EV2NU

Repair, resize and restyle customers' denim

Partnership: Cotton Incorporated's Blue Jeans Go Green denim recycling program

A rental denim collection with Danish brand Ganni

Operate Levi's SecondHand with the help of Trove, a resale-as-a-service company

Produce jeans with recycled input using Renewcell's technology

Produce jeans with recycled input using Evrnu's technology

Levi's® Simplifies the Tailor Shop Experience for Consumers

Levi Strauss launches denim recycling program

Levi Strauss is the latest company to launch a green initiative that aims to help consumers keep their denim out of landfill and tackles the problem of textile waste in the apparel industry.



LEVI'S IS LAUNCHING A BUYBACK AND RESALE PROGRAM

You'll now be able to buy vintage Levi's directly from the brand, instead of sifting through the racks at your nearest thrift store.

WHITNEY BAUCK - OCT 5, 2020

The Story Behind the Most Sustainable Levi's® Ever

Levi Strauss & Co. + EvrNu Create First Pair of Jeans From Post-Consumer Cotton Waste

Innovations also further supported by favourable policies and initiatives with Europe leading the charge



Background

The **European Commission** adopted a new Circular Economy Action Plan in March 2020. It is part of the European Green Deal that aims to make sustainable products the norm in the EU.

7 key sectors

Target sectors using the most resources and having a high potential for circularity:

- Electronics and ICT
- Batteries and Vehicles
- Packaging
- Plastics
- Textiles
- Construction and Buildings
- Food



Make Fashion Circular – the Ellen MacArthur initiative originates from the Copenhagen Fashion Summit that strives towards creating a circular economy for fashion



Global Fashion Agenda is a leadership forum that hosts the world's leading business event on sustainability in fashion, the Copenhagen Fashion Summit



The Fashion Pact is a global coalition of companies within the fashion and textile industry with three key goals: stopping global warming, restoring biodiversity and protecting the oceans

[1] The State of Circular Fashion

**[2] KEY CHALLENGES IN PURSUING
CIRCULAR MODELS**

[3] Collaborating for Impact

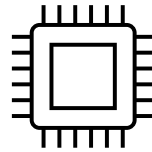


Circular models still face challenges in cost, infrastructure and socio-cultural acceptance



Financial barriers

Difficulties remain for recycled materials to achieve price parity with virgin materials; capital support required to trial and develop circular models



Infrastructure barriers

Collection and recycling systems are not efficiently in place; Access to pre- and post- consumer waste is not fully convenient



Socio-cultural barriers

Community awareness affects the effectiveness of transitioning to circular economy including policy support, private sector efforts and consumer support

Financial barriers:

Consortiums and partnerships needed to concept-proof and develop circular models

- Recycled materials are usually priced higher than virgin materials e.g. recycled cotton yarn is more expensive than standard, virgin cotton yarn
- However, higher uptake of recycled materials can result in economies of scale that drives down costs
- Consortiums and partnerships are needed to enable trial and development of circular models



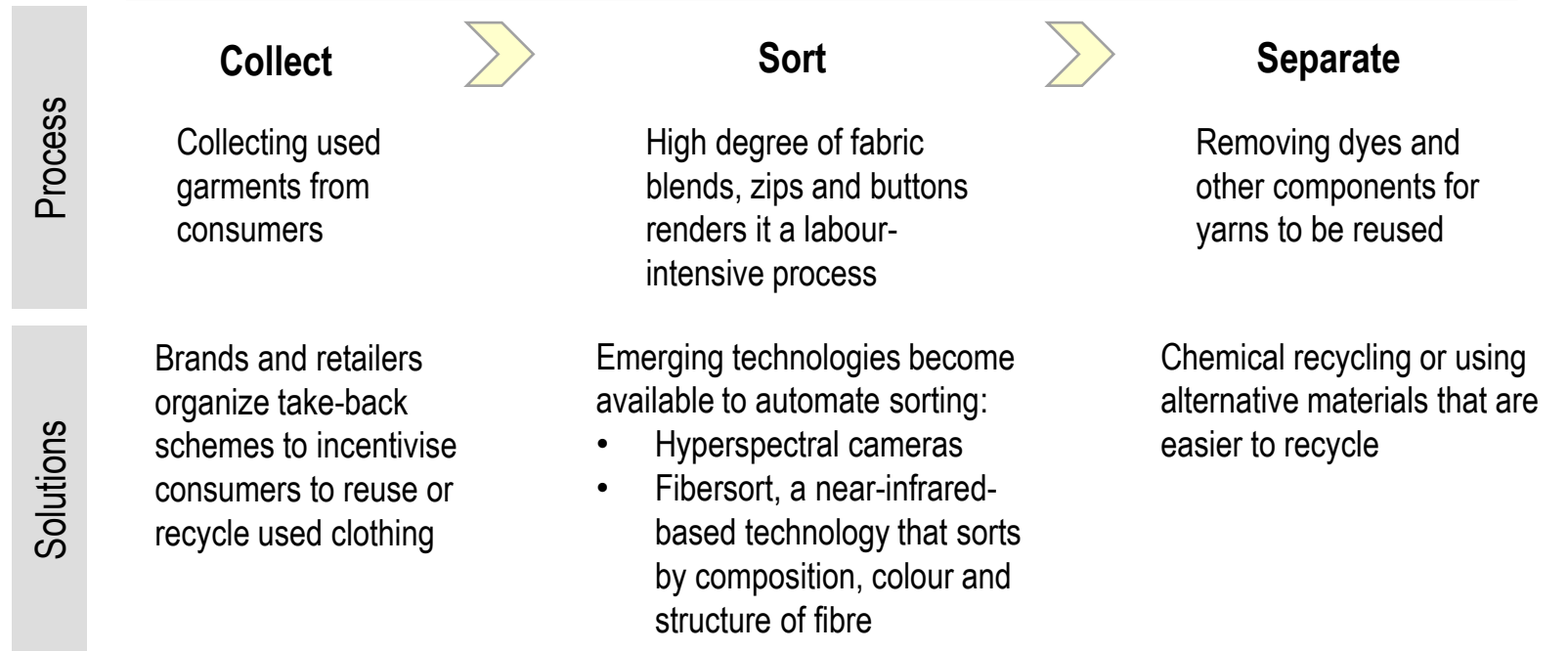
| | LOOP | New Cotton Project | Circular Economy Accelerator |
|-------------------------------|---|---|--|
| Initiative | | | |
| Details | <p>Formed by Avanto Ventures, Nordic Innovation and the Finnish Innovation Fund Sitra in 2018, LOOP serves as a Nordic circular economy ecosystem</p> | <p>A European Union-funded project aims to trial a circular model for textile waste over a three-year period starting from 2020</p> | <p>Initiated by non-profit The Recycling Partnership, it aims to connect private and public partners to resolve the low recycling of residential materials in the US</p> |
| Role of collaborations | <p>A private-public collaboration with support from investors and corporates to pilot and scale circular business ideas through three steps of Explore, Innovate and Act</p> | <ul style="list-style-type: none"> • Innovators recycle textile waste into new fibres • Manufacturers use the recycled fibres to make clothes • Apparel brands organize take-back schemes for used clothes and sell clothes made with recycled fibres | <p>A consortium of major FMCG companies and industry associations unite to advocate for sustainable funding and policy changes that incentivise recycling over disposal</p> |

Infrastructure barriers:

Holistic coordination key to enabling circularity

- In general, apparel has a lower recycle rate than other categories such as paper and PET bottles
- Recycle rate depends on access to pre- and post- consumer waste and availability and maturity of technologies
- It requires a holistic coordination across manufacturing design, collection and recycling facilities to boost efficacy

Handling post-consumer textile waste



The three processes can be streamlined if recoverability is taken into account at the beginning by considering the use of materials, component parts and overall design

Socio-cultural barriers:

Creating incentives and raising awareness crucial to transition to circular economy

Concerted efforts from the community help transition to circular economy:

- Government plays an important role in incentivizing changes initially either through fiscal policy or legislation
- This creates momentum and gradually peer pressure for companies to take actions
- Consumer support for eco-friendly products can counter-influence decisions at corporate and manufacturing levels

Creating incentives

Tax

Shift from taxing labour to taxing consumption of resources



Sweden decreases value-added tax on labour for certain repair services to encourage longer use of products

Legislation

Enact new laws to change behaviour



China sets up a nationwide system for retailers to report usage of single-use plastics and submit formal recycling plans

Raising awareness

Education

Convey messages via public campaigns



London organizes the Love-Not-Landfill campaign encouraging young consumers to recycle clothes with eye-catching clothes banks installed at busy shopping locations

Branding

Make responsible consumption fashionable



Rise of environmentally-conscious brands such as Allbirds and Everlane in the US help build a favorable climate for shopping eco-friendly products

[1] The State of Circular Fashion

[2] Key Challenges in Pursuing Circular Models

[3] COLLABORATING FOR IMPACT



We need more pilots and collaborations to drive circularity forward



Pilots

Pilots help test and launch new innovations and technologies, especially for disruptive technologies to demonstrate they are possible to scale up



Collaborations

Through collaborations, cross-sectoral challenges can be addressed by understanding problems in depth and identifying innovation opportunities

Scaling Innovations for Impact – from pilot to scale through collaborations

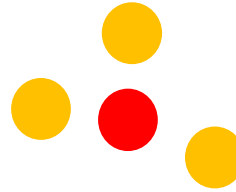
Demonstration



Pilot showcase of innovation

- Anchor brand partner
- Launch of consumer brand to raise awareness

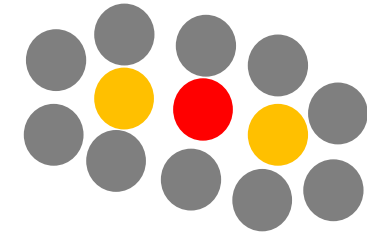
Diffusion



Innovation can be replicated

- Expand to different brand partners and product segments
- Securing key supply chain partnerships

Dispersion



Impact at scale

- Larger scale product launches
- Building out of production infrastructure

Case Study

RENEWCELL



Renewcell is a Swedish textile recycling company that produces Circulose, a patented material recycled from cotton and viscose. It grew with initial success with brand projects, followed by partnerships across the supply chain and continues to scale up.

IMPOSSIBLE



Impossible Foods is a US plant-based meat company. It started by supplying the Impossible Burger at restaurant chains and gradually expanded to grocery stores with increasing product ranges serving the US and Asian markets.

Renewcell:

Strong commercial and supply chain development within last 18-24 months

Demonstration

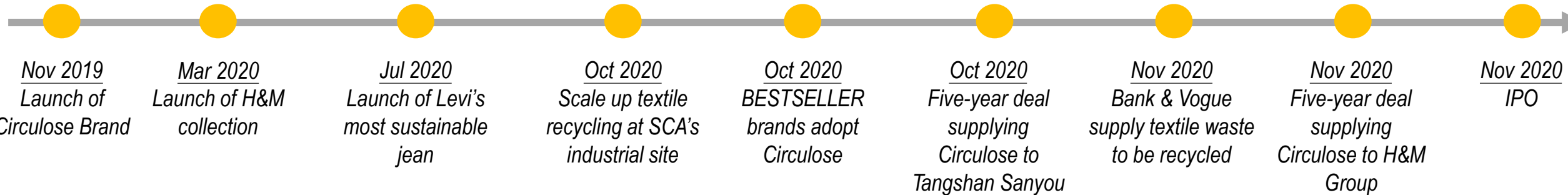
Diffusion

Dispersion

Pilot showcase of innovation

Innovation can be replicated

Impact at scale



Impossible Foods:

Robust domestic and international expansion with new product categories

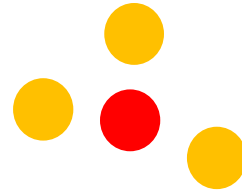
Demonstration

Diffusion

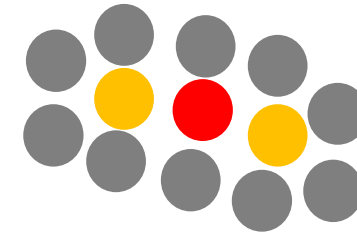
Dispersion



*Pilot showcase
of innovation*



Innovation can be replicated



Impact at scale

Jul 2016
Debut Impossible Burger at New York City restaurant Momofuku Nishi

Summer 2017
Impossible Burger launches at restaurant chains such as Bareburger, Umami Burger

Apr 2018
First international debut of Impossible Burger in Hong Kong restaurants

Aug 2019
Burger King rolls out the Impossible Whopper in all US locations

Aug 2019
Partner with OSI Group to expand production capacity

Sep 2019
Impossible Burger patties begin to sell at grocery stores in the US

Jan 2020
Launch of new products Impossible Pork and Impossible Sausage

Sep 2020
Impossible Sausage launches at restaurants and supermarkets in Hong Kong

David Chang Adds Plant Based 'Impossible Burger' to Nishi Menu
Chang's Chelsea restaurant will start serving the veggie burger that bleeds tomorrow
by *Lucia Ditz* | Jul 26, 2016, 12:07pm EDT



LA'S UMAMI BURGER UNVEILS IMPOSSIBLE BURGER

The meat-centric craft burger chain adds plant-based Impossible Burger patty to the menu at nine Southern California locations.

Impossible Foods Makes International Debut In Hong Kong

• Chef May Chow's Little Bao and Happy Paradise will be among the first to serve the Impossible in Hong Kong, and with a local Caribbean twist
• Chef Lise Opocensky's Beef & Liberty becomes the first burger chain outside the United States to serve the Impossible Burger
• Impossible Foods will launch in additional markets throughout 2018

NEWS PROVIDED BY
Impossible Foods
Apr 16, 2018 10:44 ET



National rollout of Burger King's Impossible Whopper is here

A huge step toward the normalization of burgers made from plants.

Impossible Foods partners with OSI Group to ramp up meatless burger production

Impossible Foods goes to the grocery store

Jonathan Slieber | *Entrepreneur* | 7:50 AM EDT • August 1, 2019



Impossible Foods is launching meatless pork and sausage as it prepares for a global push

IMPOSSIBLE NEWS | Jul 26, 2020 11:47 AM EDT

New plant-based Impossible Sausage now available in Hong Kong

The savory sausage is now available in all Hong Kong Starbucks and will roll out to Foco and Tropic O's this September.

Key learnings from the case studies

Lessons for Innovators



Initial awareness building

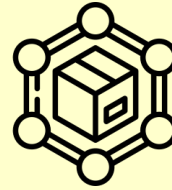
Gain attention by launching with brands and understanding product-market fit & consumers' feedback



Market expansion

Replicate strategies to other markets after initial launch to demonstrate tech's ability to scale to other segments & geographies

Lessons for Corporate Partners



Connecting partners

Mobilize supply chain partners to work with innovators to test and learn new solutions



Roadmap of products

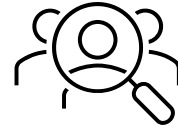
Start with pilots and iterate sustainability strategies with further product launches at increasing volume & product categories

Collaborations remain key to enable bigger impacts



Task Forces

Task forces are formed to address circularity and sustainability issues in the industry, with industry guidelines and best practices formulated.



Innovation Sourcing and Callouts

When the issues are defined, corporations look out for potential solutions and identify the most suitable ones for their case.



Pilot with Innovators

Companies further trial and validate these nascent solutions and technologies with innovators.

Collaborating as a group catalyzes the transition to circularity by:

- Spreading out costs of trialing innovations
- Facilitating mutual learnings from projects and partners
- Building momentum to enable bigger societal impacts

Task Forces

help bring industry partners on a common learning journey to analyse and define industry challenges

Background

“A collective learning journey”

- Task forces are helpful in gathering industry stakeholders to address common challenges or raising interest in emerging fields
- Typical outputs involve jointly analyzing the root causes of a problem and collectively defining guidelines, frameworks and blueprints for potential solutions



Leather Working Group (LWG) is a non-profit organization that identifies best practices for the global leather industry. Its founding members include global brands such as Adidas, Nike and key leather manufacturers.



Biosynthetics Working Group is an initiative by non-profit Textile Exchange. This task force focuses on building knowledge and supporting the development of biosynthetics as an emerging preferred fibre.

Output

Developed various audit protocols to assess the environmental impacts of leather practices including:

- LWG Environmental Audit Protocol
- LWG Trader Audit Protocol

Created the aboutbiosynthetics.org website which gathers available information and resources on biosynthetics

Highlights

- Data gathered from audits inform the development of benchmarks and standards
- Tanneries of the task force reduce energy usage by >30%
- This task force helps build traction for the nascent field of biosynthetics as an alternative to fossil-based materials

Innovation sourcing

identify the innovation landscape to shortlist potential solutions for the problems

Background

“Mapping & shortlisting”

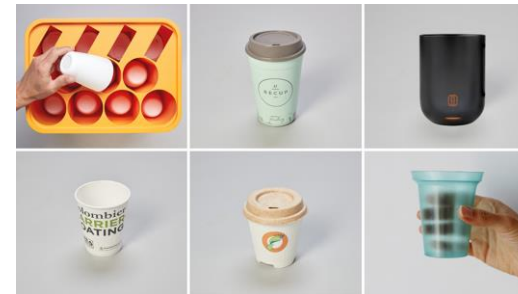
- Innovation sourcing begins with a landscaping and mapping of key technologies & innovations pertaining to a specific area
- By looking out for solutions globally and evaluating them on technical functionality and ease of scalability; potential solutions can be shortlisted for piloting.

The **NextGen Cup** is a multi-year consortium of the food and beverage industry to address single-use food packaging waste. It is organized by investment firm Closed Loop Partners with Starbucks and McDonald’s as the founding partners.



Output

The project aims to find recoverable solutions for fibre cups that fit into different regional recovery infrastructure through a three-stage process, including a global competition to call out for new solutions.



Highlights

- This project provides funding support and pilot opportunities for winning solutions to test the market and further scale up.
- The consortium works across the value chain in order to match solutions to different value chain partners including:



Piloting with innovators

helps create industry & consumer awareness while allowing solutions to be tested, refined & scaled

Background

Fashion for Good initiates the **Full Circle Textiles Project** to connect brands, innovators, manufacturers and investors to validate chemical recycling technologies for cellulosic fibre through piloting.

FASHION FOR GOOD

Output

The project aims to explore economically viable and scalable solutions for cellulosic chemical recycling by piloting with the five innovators specialized in this field.



COMING FULL CIRCLE: INNOVATING TOWARDS SUSTAINABLE MAN-MADE CELLULOSIC FIBRES

Highlights

The project helps advance chemical recycling by closing the gap in financing and limited uptake by brands.

Working across the value chain helps the apparel industry to experiment with the promising chemically recycled fibre:

Corporate partners



Innovators



“Pilot & Demonstrations”

- When established companies work with innovators, emerging solutions can be further validated gathering both consumer feedback as well as lessons learnt on the testing & implementation of the technology
- Pilots also help build market traction & momentum for further expansion

Circular Projects in Hong Kong:

G2G Recycle System, The Novetex Upcycling demonstrate a “front & back-end” recycling model

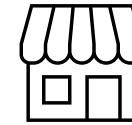
Background

Highlights

FRONT-END: Garment-to-Garment (G2G) Store



The G2G Recycle System is a **customer-facing** mini production line that recycles post-consumer garments into clean and wearable clothes at The Mills. It is a joint collaboration among the Hong Kong Research Institute of Textiles and Apparel (HKRITA), H&M Foundation, Novetex Textiles Limited and The Common Ground.



Consumer education
It is an experiential retail concept where consumers can witness the upcycling process in-store



Mini on-site production
The G2G system can process 40 used sweaters and t-shirts monthly allowing consumers to experience recycling “live”

BACK-END: The Novetex Upcycling Factory



The Novetex Upcycling factory in Tai Po is a large-scale textiles recycling facility that does not consume water or produce chemical waste and also includes innovations in sorting & separating garment waste. It is a joint collaboration between Novetex Textiles Limited and HKRITA.



Industrial scale-up
The Novetex Upcycling factory can handle up to three tonnes of textile waste per day in Hong Kong; helping provide capacity at scale to support the front-end recycling retail store

Circular Projects in Hong Kong:

New Life Plastics JV convenes 3 key partners focusing not just on recycling but also consumer engagement and logistics/ collection

Background

Highlights

The New Life Plastics JV



The New Life Plastics JV is Hong Kong's first dedicated PET and HDPE recycling facility at Eco Park in Tuen Mun. It is jointly formed by ALBA, Baguio and Swire Coca-Cola.



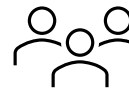
Convergence of expertise
ALBA – recycling technology
Baguio – domestic collection network
Swire Coca-Cola – domestic beverages market



Consumer education
 The plant features a viewing gallery with tours that explain the plastics recycling process



Industrial scale-up
 The plant aims to recycle over 35,000 tonnes of post-consumer PET and HDPE into food-grade flakes and pellets for reuse



Community engagement for collection
 Project also involves holistic thinking on other recycling challenges like collection through engagement with schools, corporates & other institutions as collection points for waste

Conclusion

The State of Circular Fashion

- More apparel brands and retailers embrace circular economy by adopting innovations in rental, resale, recycling and practicing regenerative agriculture. The circular models are beneficial to economic growth and addressing global warming.
- Europe leads in driving circular economy with favorable policies and measures in place that unite stakeholders to achieve sustainability goals together.

Key Challenges in Pursuing Circular Models

- Recycled materials tend to be costly. Forming industry consortiums and partnerships are helpful in trialing and developing circular models fast.
- Infrastructure is crucial requiring a holistic coordination across manufacturing design, collection and recycling facilities to enable circularity.
- Concerted efforts from the community are needed to create incentives and raise awareness to help the industry transition to circular models.

Collaborating for Impact

- More pilots and collaborations are helpful in driving circularity forward as startups Renewcell and Impossible Foods have demonstrated their success.
- There are three common types of collaborations worldwide: task forces, innovation sourcing and callouts, pilots with innovators. The key lies in uniting important stakeholders to resolve common industry challenges together.
- Circular projects are gaining traction in Hong Kong with the examples of G2G Recycle System, The Novetex Upcycling factory and The New Life Plastics JV.





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