PreScouter

Towards a Circular Economy: Zero-Waste Technologies & Initiatives

Research Support Service

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Prepared by: **PreScouter**
Marija Jović, PhD I Technical Director
Marta Silva Carvalho, PhD I Researcher
Subhra Pradhan, PhD I Researcher

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Intelligence Brief Question

What promising and innovative zero-waste technologies and initiatives are fueling a more circular economy?

A circular economy is an economy that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times while distinguishing between technical and biological cycles.[1] For 2019, sustainability, recycling, and the circular economy were among the top industry trends; and they will continue to be so for the next decade to reduce plastic waste, carbon footprints, and emissions.

In this Intelligence Brief, PreScouter looks at 10 companies offering a zero-waste technology or initiative, with the greater focus being on those directed towards plastics.

1. https://www.ellenmacarthurfoundation.org/assets/downloads/Cities-in-the-Circular-Economy-The-Role-of-Digital-Tech.pdf

Executive Summary

PreScouter investigated 10 companies that fall under one of the two main circular economy categories: recycling and reusing.

Recycling (Chemical & Mechanical)

Ioniqa: Upcycles all types of PET into PET monomers, producing near virgin-quality PET

Veolia: Recycles PET plastic bottles to produce recycled PET that can be used to make bottles and food packaging

Novolex: Upcycles plastic bags, ziplock bags, and sealed-air mail pouches, dry cleaning bags, and cereal box liners into polyethylene pellets that can be used to produce new bags

Danone (with Re>Pal): Recycles polypropylene water bottle labels into recyclable pallets

Banyan Nation: Recycles any kind of scrap plastics (mixed plastics) to produce near virgin-quality plastic

Executive Summary

Recycling (Chemical & Mechanical) *cont'd*

Fuenix: Transforms any kind of plastic into pyrolysis oil (naphtha, paraffin, and LPG) that can be used as a feedstock for new virgin polymers

Closing the Loop: Recycles mobile phones (both plastic & metal parts) to produce recycled phones at an affordable price

H&M: Offers a garment recycling service for recycling clothes made from polyester, organic cotton, and TENCEL lyocell

Reusing

RePack: Offers a returnable and reusable packaging service

Nestlé: Is aiming to replace single-use plastics with stainless steel refillable containers

H&M: Is piloting a reusable packaging service for e-commerce activities (in collaboration with Repack)

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RECYCLING TECHNOLOGIES

Ioniqa Technologies
The Circular Initiative

Founded: *2009*
Website: *https://ioniqa.com/*
Headquarters: *Eindhoven, Netherland*
Contact: *+31 40 751 7630, info@ioniqa.com*

The Circular Initiative by Ioniqa Technologies

Targeted Product:	All types of PET
Technology:	Patented recycling technology

Partners:

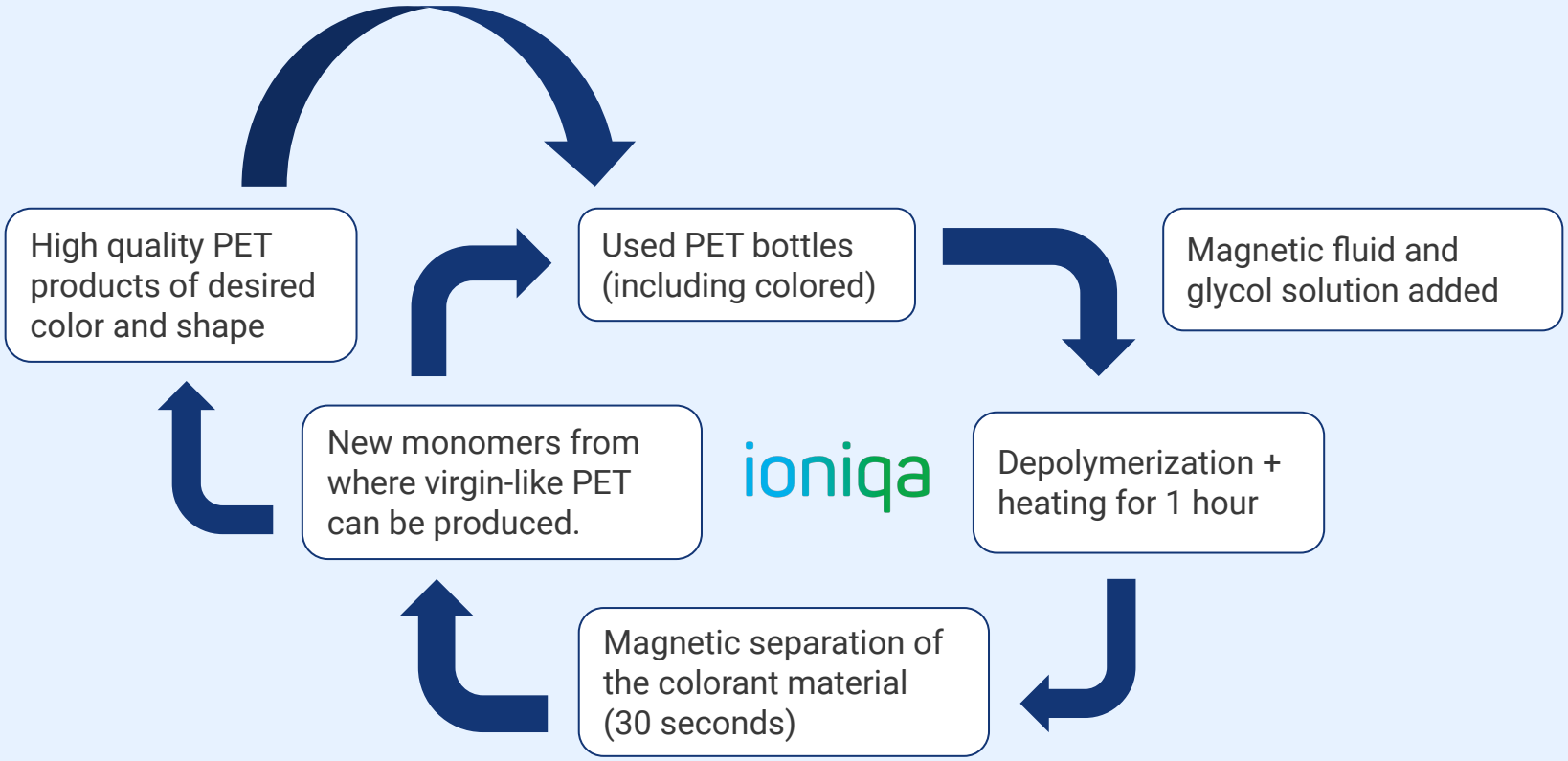
Overview

The company was founded in 2009 as a clean-tech spinoff from the Eindhoven University of Technology and the Dutch Polymer Institute in Eindhoven, creating a circular economy for plastic in a cost effective industrial way so that one-fourth of the world's plastic waste can be reused infinitely. They are researching how other kinds of plastics and organic materials can be reused in the future.

Technology

The process can upcycle **all types of PET, including colored plastic**. The newly transformed material that is produced is similar to plastics produced from oil (near virgin-quality). Ioniqa uses a proprietary magnetic colloidal system with nanoparticles to convert all types of PET plastics into new reusable monomers that can be used for making plastics that are, again, 100% recyclable. This new upcycled raw material is suitable for any use, including food-grade plastic.

The Circular Initiative by Ioniqa Technologies



The Circular Initiative by Ioniqa Technologies

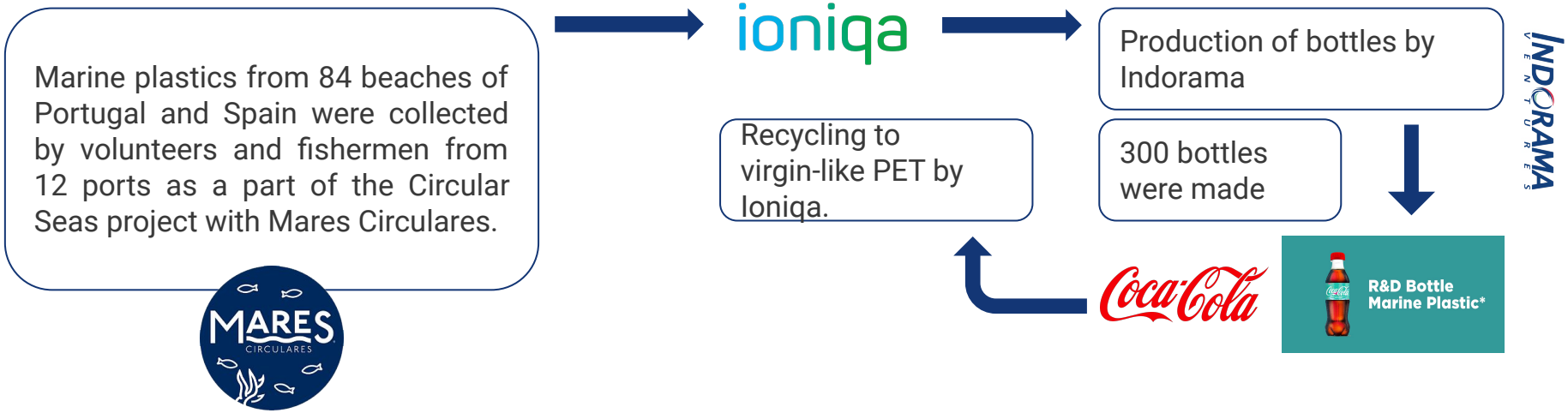
Achievements:

1) Ioniqa established a **10K-tonne scale-up plant** in September 2018 at Brightlands Chemelot Campus in Geleen, where used plastic will be converted to high-quality PET material to be used for food packaging.
2) Ioniqa won the Dutch government's 2019 National Icons award and will receive a 3-year support grant. It also started trading on the **Amsterdam stock exchange** in October 2019.
3) Launched the **NOW (*No Waste Movement*) initiative**, which requires the buying of upcycled plastics that can be endlessly recycled and reused. They are asking consumers to buy upscaled plastics rather than new plastics made from oil, thus spreading the message to encourage their use.
4) Ioniqa has partnered with Indorama Ventures, Coca-Cola, and Mares Circulares to **retrieve marine plastic from Mediterranean seas and beaches.** And they made the first-ever bottle from ocean plastic. In the initial phase, around 300 bottles were made for Coca-Cola with 25% recycled marine plastics. Coca-Cola has plans to start using these bottles in 2020.

1. https://ioniqa.com/applications/
2. https://www.tue.nl/en/news/news-overview/dutch-cabinet-appoints-tue-spin-off-ioniqa-as-national-icon/

The Circular Initiative by Ioniqa Technologies

The Ioniqa, Indorama Ventures, and Coca-Cola partnership:



1. https://ioniqa.com/applications/
2. https://www.tue.nl/en/news/news-overview/dutch-cabinet-appoints-tue-spin-off-ioniqa-as-national-icon/

Veolia
Bottle to Bottle Initiative

Program Contract Initiated: *2002*
Website: *www.veolia.co.kr/en/bottle-bottle-source-end-user*
Headquarters: *Rostock, Germany*

Bottle to Bottle Initiative by Veolia

Targeted Product:	PET plastic bottles
Technology:	UnPET Hybrid Technology

Partners:

Overview

Veolia is a company dealing with waste management, water management, and energy services. It is a key player in the plastic circular economy. The company has taken several initiatives to reduce plastic waste across the world. The Bottle to Bottle initiative in Rostock, Germany, is one such program. One billion PET drink bottles are recycled each year in their factory in Germany. This initiative has created local jobs, which in turn has resulted in increased recycling awareness.

After their success in Germany, Veolia announced in May 2019 that they are building their largest Bottle to Bottle recycling factory in Java, Indonesia, and partnering with Danone-AQUA. This factory will be able to produce **25,000 tonnes of recycled PET** per year that can be used in the Indonesian food industry.

Bottle to Bottle Initiative by Veolia

Technology

Post-consumer used plastic bottles are collected and transported to the recycling center. Next, they are sorted according to color. The bottles are then shredded into flakes and washed in hot water. After that, the flakes are converted into a product that is suitable for food packaging. Mechanical and chemical recovery processes are applied for this purpose. Finally, the flakes are transported to the bottle manufacturers. UnPET Hybrid Technology (process by URRC) is used to recycle.

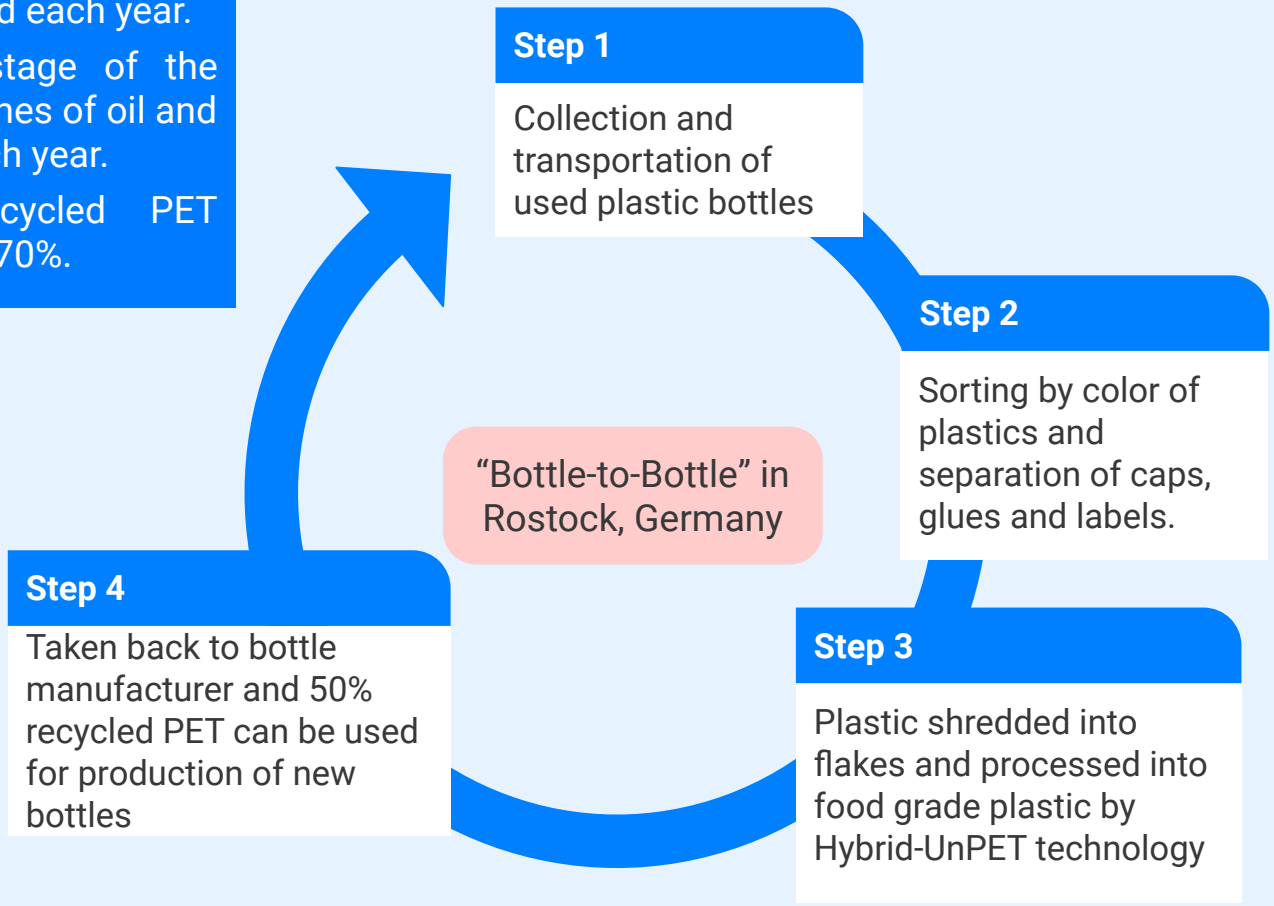
This newly recycled PET is fully in compliance with the regulatory guidelines of the US FDA, Switzerland's Federal Office of Public Health, Germany's Fraunhofer Institute, and other similar bodies to be used in food packaging.

1. https://www.veolia.com/en/our-customers/achievements/industries/circular-economy/germany-rostock-0
2. https://circulareconomy.europa.eu/platform/en/good-practices/giving-plastic-bottles-second-life-through-bottle-bottle-rostock

Bottle to Bottle Initiative by Veolia

Impact

- 1 billion bottles are recycled each year.
- Eliminates the melting stage of the plastics, saving 31,000 tonnes of oil and 113, 000 tonnes of CO_2 each year.
- Bottles made with recycled PET reduces CO_2 emissions by 70%.



Novolex
Bag-2-Bag Recycling Initiative

Founded: *2004*
Website: *https://novolex.com/hilex-poly/*
Headquarters: *Hatsville, South Carolina*
Contact: *info@novolex.com*

Bag-2-Bag Recycling Initiative by Novolex

Targeted Product:	Various types of plastic bags
Technology:	Closed-loop recycling

Partners:

Overview

Novolex is one of the leading producers of packaging materials in North America. Sustainability is their priority, and their portfolio includes recycled paper and plastic products. Novolex's Bag-2-Bag program is one such initiative, where the customers can bring back their plastic retail bags and other plastic materials like films and wraps to local stores to be recycled into new bags.

The Bag-2-Bag program is run by **Hilex Poly**, a brand of Novolex and a leading producer of plastic bags with one of the world's largest plastic recycling factories in North Vernon, Indiana.

Bag-2-Bag Recycling Initiative by Novolex

Technology

The recycling center shreds, washes, and processes bags back into polyethylene pellets that can be again used for plastic bag manufacturing, hence closing the loop for plastic bags. It can process plastic bags, ziplock bags, sealed-air mailing pouches, dry cleaning bags, cereal box liners, etc. It does not recycle materials such as PET bottles, frozen food bags, PVC, and PVDC.

In this project, Novolex has installed **more than 30,000 drop-off centers** across the United States to collect used plastic bags and films for recycling. According to their report published in 2013, Hilex Poly invested over UAS 25 million in its recycling center, and in 2012 it recycled more than 20 million pounds of plastic bag waste.

This is the **first closed-loop recycling system in the United States.** The recycled bags produced have 25%-40% recycled content, which can be increased to 100% if they receive more plastic waste. Novolex works with retailers and grocers in cooperation with the American Progressive Bag Alliance (APBA).

1. https://novolex.com/wp-content/uploads/H_BI_0125_0217_Bag2BagBifold.pdf
2. https://novolex.com/hilex-poly/

Bag-2-Bag Recycling Initiative by Novolex

Bins at collection center

Packing of the used plastic bags

Transported to Novolex recycling center

Recycled and repelletized

New bags are produced from the recycled pellets

POLY HILEX™ A NOVOLEX BRAND

Closing the loop

Danone
Plastic Label Recycling

Founded: *1919*
Website: *https://www.danone.com/*
Headquarters: *Paris, France*
Contact: *+33 1 44 35 20 20*

Plastic Label Recycling by Danone

Targeted Product:	Plastic water bottle labels
Technology:	Re>Pal's ThermoFusion technology

Partners:

Overview

Danone is a leading global food and beverage company, with products sold in over 120 markets. Danone aims to inspire healthier and more sustainable eating and drinking practices by implementing new actions to ensure the circularity of its packaging and to aid the transition to a 100% circular packaging economy worldwide by 2025. The company is developing reusable packaging alternatives by reintegrating recycled materials into packaging. Moreover, Danone supports research and innovation, collaborating with nonprofit startups in developing highly promising innovative solutions to eliminate plastics from the oceans.

Plastic Label Recycling by Danone

Technology

In 2019, Danone started a pilot program in collaboration with its Indonesian brand AQUA. Danone-AQUA is a pioneer of the drinking water industry in Indonesia. Danone-AQUA's aim is to deliver healthy, clean, and pure drinking water to the entire population as the number-one natural bottled water company in Indonesia. This initiative is looking to reduce 70% of plastic waste output by 2025. Danone-AQUA aims to make all of its packaging 100% reusable, compostable, and recyclable by 2025.

Danone-AQUA, in collaboration with Re>Pal Indonesia, is working to convert its water bottle labels from polypropylene plastic into pallets. Danone-AQUA will further use these Re>Pal pallets across its water business in Indonesia. At the moment, Re>Pal can reuse AQUA labels up to a maximum of 25% into the mixed waste plastic without compromising the quality of Re>Pal's pallets. Furthermore, Danone is looking at other areas where Re>Pal's technology can be used to recycle more types of plastics into pallets.

1. https://journals.openedition.org/factsreports/5198#entries
2. https://www.danone.com/content/dam/danone-corp/danone-com/about-us-impact/policies-and-commitments/en/2018/Danone_Packaging_Policy.pdf
3. https://www.ellenmacarthurfoundation.org/assets/downloads/GC-Report-June19.pdf

Plastic Label Recycling by Danone

Re>Pal patents the **ThermoFusion** process that allows the use of waste plastic, which would otherwise be polluting our environment, to produce **pallets**. This allows the creation of a malleable dough from mixed plastic waste without requiring the sorting of the waste material and the production of virgin plastic. Then, by compression molding, this malleable dough is made into recycled pallets.

Re>Pal collects Danone-AQUA water bottles

Distribution of Danone-AQUA water bottles

Re>Pal separates plastic labels from Danone-AQUA water bottles and, by ThermoFusion processing, converts them into pallets

Danone-AQUA uses Re>Pal pallets in its water packaging business

Re>Pal Technology

Banyan Nation
Better Plastic

Founded: *2013*
Website: *http://banyannation.com/*
Headquarters: *Hyderabad, India*
Contact: *contactus@banyannation.com*

Better Plastic by Banyan Nation

Targeted Product: Any kind of scrap plastics (mixed plastics)

Technology: Proprietary plastic cleaning technology

Partners:

Overview

Banyan is one of India's first plastic recycling companies that uses a proprietary plastic cleaning technology to create a product called Better Plastic from post-consumer and post-industrial used plastic. Banyan Nation raised seed funding of USD 800 thousand in 2016. They are working with Tata Motors (car bumpers), L'Oreal India (product packaging), and Intel India. The company recycles and re-engineers 1,200 tonnes of plastic and provides it to manufacturing industries for reuse. It was the winner of the Dell Circular Economy People's Choice Award, an initiative of the World Economic Forum and the Forum of Young Global Leaders.

1. https://youtu.be/JtCpf32x3Vs
2. https://www.crunchbase.com/organization/banyan-nation
3. https://yourstory.com/2018/01/banyan-nation-clean-india-world-taking-note
4. https://www.youtube.com/watch?v=DtwI4X5fEgU

Better Plastic by Banyan Nation

Technology

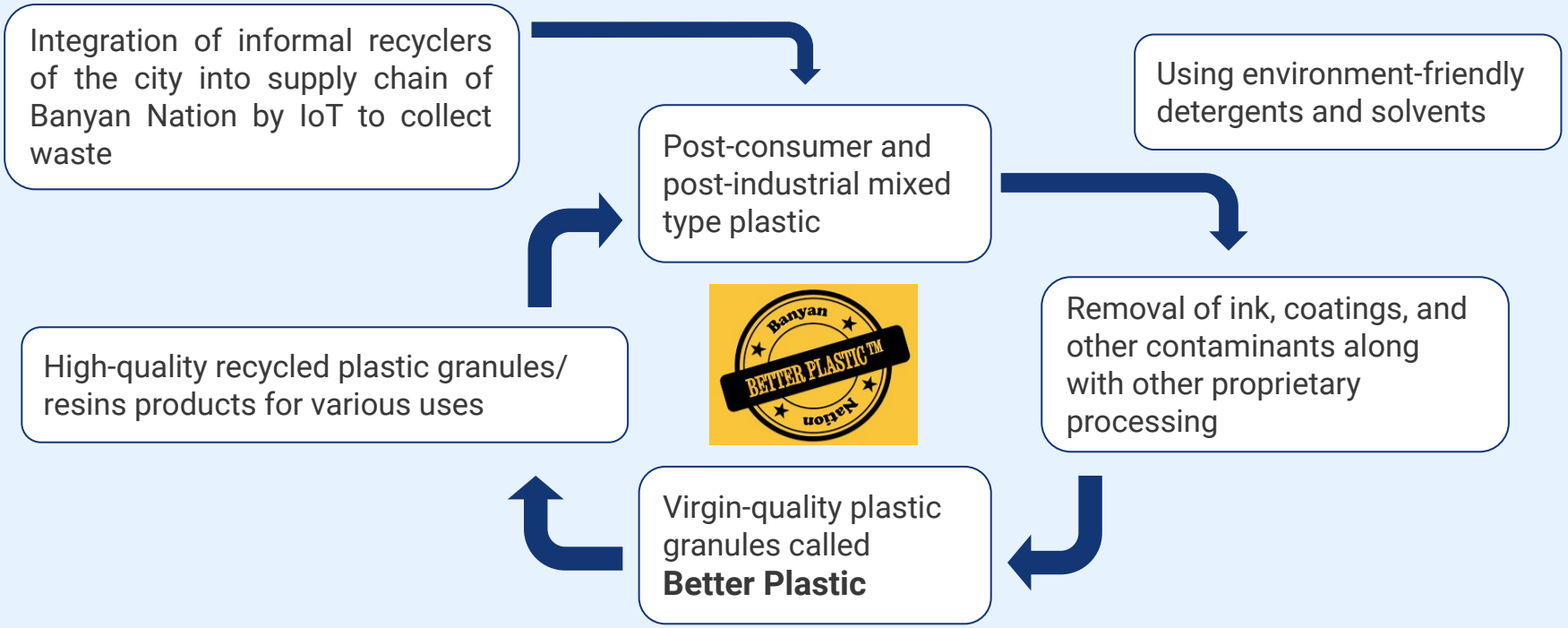
Banyan Nation accepts any kind of scrap plastic, such as auto parts, woven sacks, and shampoo bottles. Next, the coatings, ink, and other impurities are removed using environment-friendly solvents and a proprietary plastic-cleaning technology to create a near virgin-quality plastic called Better Plastic. Performance polymers are added to the this new kind of plastic to be used in the automobile and electronic industry.

The ability of Better Plastic to be recycled again when it re-enters the waste chain is increased by three times from its original forms due to its added superior qualities. Banyan can also customize and identify grades of recycled plastics according to the need of the customer. They specialize in packaging, consumer electronics, automotive parts, and durable furniture. The Impact Investment Exchange (IIX), Shujog, and KKR Global Investments partner with Banyan Nation to raise funds.

1. https://www.businesswire.com/news/home/20160301007214/en/IIX-Shujog-KKR-Partner-Banyan-Nation-Increase

Better Plastic by Banyan Nation

Importance of Data Intelligence in Banyan Nation's initiative: Banyan Nation, with the help of mobile phones and other IT systems, mapped the whole network (>1500 centers) of plastic collectors, aggregators, and informal recyclers in Hyderabad, India, to integrate them into their supply chain to procure the plastics. In the next step, they went above and beyond that by making a platform that is now being utilized by municipalities to sense, track, and analyze data on waste flow. In India, the state of Telangana has signed a memorandum of understanding with Banyan Nation to use the platform throughout the state.



Fuenix Ecogy Group

Let no plastic go to waste

Founded: *2013*
Website: *https://fuenix.com/*
Headquarters: *Weert, Netherlands*
Contact: *+31621531237, kiran.hofker@hkstrategies.com*

Let no plastic go to waste by Fuenix Ecogy Group

Targeted Product:	Any kind of plastic waste
Technology:	Ecogy gasification

Partners:

Overview

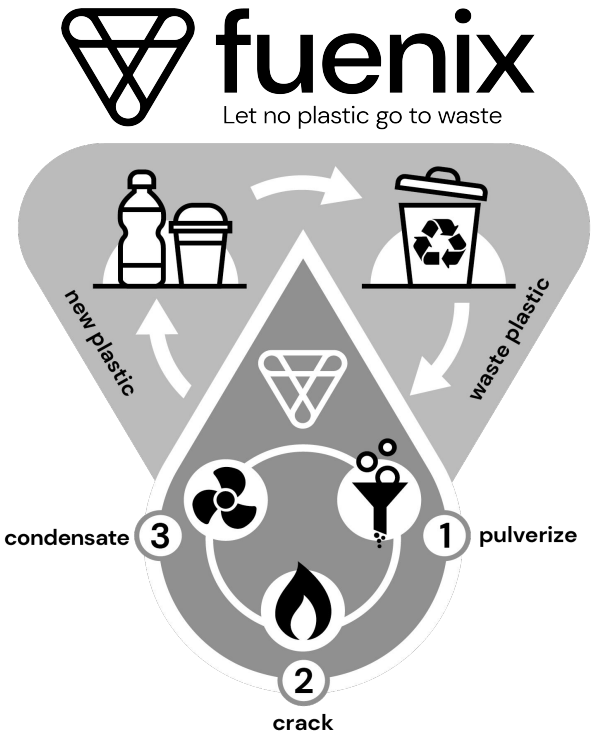
The company was founded in 2013 in the Netherlands. They started their pilot plant in 2016 and used the Ecogy gasification technology to produce paraffin and naphtha from plastics. Their operational tests started in 2017, and they have now fully developed the technology. In August 2019, Fuenix entered into an agreement with Dow Chemicals to supply them with pyrolysis oil feedstock from plastic waste and simultaneously help them to scale up their technology. The goal of Fuenix Ecogy is to *let no plastic go to waste*.

1. https://fuenix.com/
2. https://www.plasmapower.eu/
3. https://fuenix.com/wp-content/uploads/2019/08/dow_fuenix_pressrelease-29-8-2019.pdf

Let no plastic go to waste by Fuenix Ecogy Group

Technology

Fuenix's innovative technology converts any kind of plastic waste into its fundamental form; that is, oil. They have developed a novel Fuenix Ecogy technology by which end-of-life post-consumer mixed type plastic can be converted into naphtha, paraffin, and LPG (circular feedstock). The advantage is that **for every 1 kg of plastic, 70% can be converted to new plastic** without the need for crude oil, along with a **50% reduction in CO_2 emissions.**



Let no plastic go to waste by Fuenix Ecogy Group

New packaging material for goods including food and pharmaceuticals

Hard-to-recycle mixed plastic

Hybrid Fuenix Ecogy technology

Pyrolysis oil feedstock (naphtha, paraffin, LPG)

Supply to Dow Chemicals

New virgin polymer will be produced in Terneuzen at Dow's production facilities

fuenix
Let no plastic go to waste
DOW
Seek Together™

Closing the Loop
Recycled Mobile Phones

Founded: *2012*
Website: *https://www.closingtheloop.eu/*
Headquarters: *Amsterdam, Netherlands*
Contact: *+31 20 75 26 506*

Recycled Mobile Phones by Closing the Loop

Targeted Product:	Mobile phones
Technology:	Recycling

Partners: T-Mobile, Schiphol Group

Overview

Closing the Loop sells recycled mobile phones from Africa to prevent them from ending up in landfill sites. These recycled phones are then sold at affordable prices. The company also extracts components that can no longer be used. Its goal is to prevent mobile phones from ending up in landfills and to create a more sustainable telecom industry at the same time. Interestingly, the company has turned more than **2.3 million damaged phones** into local income.

Closing the Loop partners with local entrepreneurs in Africa and Asia, aiming to create networks that collect old mobile phones for recycling. The company pays people in emerging markets to collect old phones, and these phones are then recycled on behalf of Closing the Loop's customers. Some of their customers are T-Mobile, KPMG, Rabobank, and the Dutch national government.

Recycled Mobile Phones by Closing the Loop

Technology

Closing the Loop **buys and collects** end-of-life phones in African countries on behalf of its customers. These phones are then **recycled in Europe**. Most mobile phones contain plastics and precious metals from the circuit board such as gold, copper, lead, and zinc.

To recover plastics from the phone components, incineration is used. The plastic of the phones' outer body is usually granulated and then used in moldings. Since 2014, two million scrap phones have been collected in emerging markets. In 2015, the first container with mobile phones was shipped to Europe from Ghana for recycling. In this way, Closing the Loop turns **old phones into valuable resources and an income for people in developing countries**. Then, Closing the Loop sells new mobile phones using these recycled materials at affordable prices.

1. https://eulacfoundation.org/en/system/files/case_studies_circular_economy_eu_lac.pdf
2. https://www.closingtheloop.eu/

Recycled Mobile Phones by Closing the Loop

The company pays people in emerging markets to collect scrap phones

Collection of used mobile phones in emerging markets

Generate income for people in developing countries

Recycling of discarded phones (metal and plastic)

Collaborations

T-Mobile · Schiphol Group

Production of new mobile phones

Selling mobile phones at affordable prices

Discarded mobile phones

CLOSING THE LOOP

H&M Group
Closed-Loop Manufacturing

Founded: *1947*
Website: *https://hmgroup.com/*
Headquarters: *Stockholm, Sweden*
Contact: *+46 8 796 55 00*

Closed-Loop Manufacturing by H&M Group

Targeted Product:	Clothing
Technology:	Recycling of garments

Partners:

Overview

H&M is a Swedish multinational clothing retail company known for its fast-fashion clothing. The company is the second-largest global clothing retailer. It has a significant online presence, with online shopping available in 33 countries.

Technology

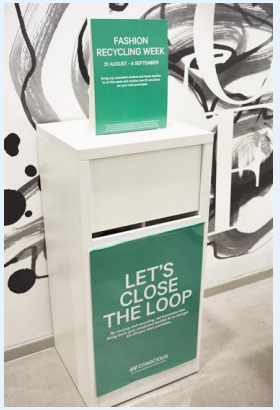
H&M launched their Conscious collection with products made from recycled materials or materials with a lower environmental impact, such as polyester, organic cotton, and TENCEL lyocell. The company offers a garment recycling service across all stores. All clothes collected by H&M are either reused, reworn, or recycled with 0% going to landfills. H&M collaborates with I:Collect, which collects the old clothes and recycles them. From these recycled materials, new products and clothes are produced. I:Collect provides the infrastructure to guarantee that the raw materials from discarded clothes go into a closed-loop manufacturing cycle.

H&M Group

In 2018, H&M collected **20,649 tonnes of textiles** for reuse and recycling, representing the equivalent of **103 million t-shirts**!

Production of clothes from Conscious collection

Customers buy new clothes



Customers drop old clothes into in-store garment collecting boxes

Recycled polyesthers, organic cotton, and TENCEL lyocell

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REUSING TECHNOLOGIES & INITIATIVES

Nestlé

Founded: *1866*
Website: *https://www.nestle.com/*
Headquarters: *Vevey, Switzerland*
Contact: *+41 21 924 1111*

Nestlé

Targeted Product:	Single-use plastics
Technology:	Refillable stainless steel containers

Partners: TERRACYCLE

Overview

Nestlé is a Swiss multinational food and drink company. It is part of the Core Partners group of the New Plastics Economy, an initiative that brings together key stakeholders to rethink and redesign the future of plastics. Regarding plastic packaging, Nestlé wants to build a circular economy to reuse waste plastic that would otherwise be polluting our environment. Therefore, Nestlé aims to eliminate all unnecessary plastic items, ensure that the plastics used are reusable, recyclable, or compostable, and circulate all the plastic items to keep them in the economy and out of the environment.

Nestlé

Technology

In January 2019, Nestlé launched a reusable/refillable Häagen-Dazs container from stainless steel in the United States, avoiding plastic packaging waste. They are currently exploring other products and countries, such as the United Kingdom, Canada, and Japan, where they could apply the same strategy.

This initial pilot run will evaluate if consumers will adhere to this initiative as well as how feasible it is and if the containers meet the desired product requirements. The response has been very positive, and 10 more different brands have adhered to this initiative in collaboration with Loop, a circular shopping platform that allows the delivery of durable and reused containers to consumers.

The new service delivers Häagen-Dazs ice cream to consumers' doorsteps in refillable containers and then picks up the empty canisters to be reused. Customers will also be able to buy reusable Häagen-Dazs containers in-store and receive a discount on refills.

1. https://www.ellenmacarthurfoundation.org/assets/downloads/GC-Report-June19.pdf
2. https://www.nestle.com/media/news/nestle-new-plastics-economy-leadership-circular-economy-plastics

Nestlé

Reusable/refillable Häagen-Dazs container

Nestlé launched a new service that delivers Häagen-Dazs ice cream to consumers' doorsteps in refillable containers and then picks up the empty canisters to be reused. The service, called Loop, is a partnership with the global recycling organization TerraCycle, based in Trenton, New Jersey. Moreover, customers will be able to buy reusable Häagen-Dazs containers in-store and receive a discount on refills.

Häagen-Dazs ice cream is delivered to consumers in refillable containers

Empty canisters are picked up to be reused

Avoids food packaging waste

Häagen-Dazs containers are refilled

Consumer buys refillable Häagen-Dazs ice cream from Loop's website

RePack

Founded: *2011*
Website: *https://www.originalrepack.com*
Headquarters: *Helsinki, Finland*
Contact: *+358 40 632 6122*

RePack

Targeted Product:	Delivery packaging
Technology:	Reusable packaging service

Partners: N/A

Overview

RePack is a packaging service that allows the return and reuse of delivery packaging for online retailers and their users. The service and packaging is designed by Plan B From Outer Space Oy, a Finnish company focused on sustainable product and business model solutions.

RePack is present in more than 50 webstores, and about 125,000 transactions have been done using RePack services.

RePack

Technology

RePack offers a returnable and reusable packaging service to deliver online products. Consumers can select their delivery option during online shopping and will receive their products in RePack packages, which they can drop into a post box that will go back to the retailer.

The company believes this strategy will save packaging material and **reduce CO_2 emissions by 80%**. RePack bags are made of recycled materials, and they offer three adjustable sizes. After receiving the order, the RePack business model offers discounts if the customers return the packaging by dropping the Repack package into any post box or Weekday store. The Repack package is then cleaned and made suitable for reuse.

1. https://medium.com/global-design-futures/circular-economy-case-studies-e95d39fc7c54
2. https://www.originalrepack.com/

RePack

RePack replaces single-use packaging

RePack delivers its bags to webstores

Customers order from the webstore using RePack services

Order is delivered using RePack packaging

Customers return the RePack bag

Recycled RePack bags

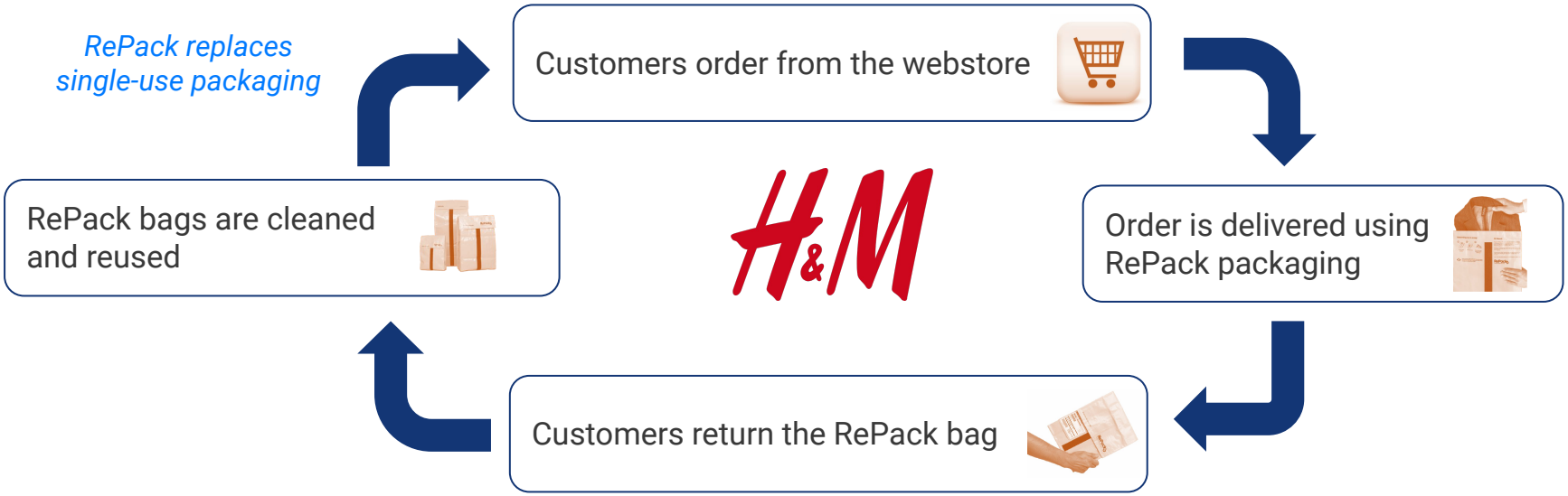
H&M Group

Founded: *1947*
Website: *https://hmgroup.com/*
Headquarters: *Stockholm, Sweden*
Contact: *+46 8 796 55 00*

H&M Group

Technology

H&M is designing their packaging for refilling and reuse, aiming to create a circular flow for reusable and refillable packaging. The company is piloting reusable packaging for their e-commerce activities in collaboration with RePack. The RePack model recirculates the same packaging over and over again. After receiving an order, H&M customers will get a discount if they return the packaging to one of the designated drop-off sites.



1. https://hmgroup.com/media/news/general-news-2019/a-more-sustainable-online-shopping-experience.html

About the Authors

About the Authors

Marija Jović, PhD

Technical Director, Chemicals, Materials & Packaging

Marija is an alumnus of the global advanced degree researchers network and has worked with PreScouter for more than 5 years and on over 100 projects spanning across areas such as product and process improvement and development, sustainability, and industry trends throughout the chemicals, materials, and packaging industries. Marija completed her Master's degree in Polymer Engineering from Belgrade University and her PhD in Organometallic Chemistry and Catalysis at the Swiss Federal Institute of Technology (ETH Zurich). Marija's academic research was focused on understanding reaction mechanisms in order to rationally design catalysts for polymerization and metathesis reactions. Prior to her PhD, Marija worked in the chemical industry on the synthesis of new textile dyes.

About the Authors

Marta Silva Carvalho, PhD

University of Lisbon, Portugal

Marta is a Biomedical Engineer and is currently working as a Research Associate at the Institute for Biosciences and Bioengineering of Instituto Superior Técnico, University of Lisbon. She has a PhD in Bioengineering from Instituto Superior Técnico, University of Lisbon, and worked in collaboration with Rensselaer Polytechnic Institute as a Visiting Researcher, where she developed novel biomimetic 3-D matrices for stem cell–mediated bone formation. Marta's career interest lies in the exploitation of the extracellular matrix to direct stem cell fate, and her passion is the translation of scientific breakthroughs to clinical implementation, improving global health.

About the Authors

Subhra Pradhan, PhD

Senior Scientist, Glycoselect Ltd., Dublin, Ireland

Subhra obtained her BS in Botany from the University of Calcutta, India, and her MS in Molecular Biology & Biotechnology from the University of Kalyani, India. She went on to earn her PhD in Molecular Microbiology from the CSIR-Indian Institute of Chemical Biology, where her studies focused on the molecular genetics of pathogenic bacteria. She then focused her research on the field of antibacterial therapeutics, small molecule drug discovery, and assay development. She is currently interested in analytics and purification of glycosylated therapeutic biomolecules using microbial lectins.

Next Steps

SOME POSSIBILITIES THAT PRESCOUTER CAN OFFER FOR CONTINUATION OF OUR RELATIONSHIP

- ☑ COMPETITIVE INTELLIGENCE
- ☑ TECHNOLOGY & PATENT LANDSCAPING
- ☑ TECHNOLOGY ROADMAPPING
- ☑ MARKET RESEARCH & ANALYSIS
- ☑ TRENDS MAPPING
- ☑ ACQUIRE NON-PUBLIC INFORMATION
- ☑ PATENT COMMERCIALIZATION STRATEGY
- ☑ DATA ANALYSIS & RECOMMENDATIONS
- ☑ REVIEW BEST PRACTICES
- ☑ SUPPLIER OUTREACH & ANALYSIS
- ☑ CONSULT WITH INDUSTRY SUBJECT MATTER EXPERTS
- ☑ INTERVIEWING COMPANIES & EXPERTS

WE CAN ALSO DO THE FOLLOWING

- ✔ **CONFERENCE SUPPORT:** Attend conferences of interest on your behalf.
- ✔ **WRITING ARTICLES:** Write technical or more public facing articles on your behalf.
- ✔ **WORKING WITH A CONTRACT RESEARCH ORGANIZATION:** Engage with a CRO to build a prototype, test equipment or any other related research service.

For any requests, we welcome your additional questions and custom building a solution for you.

About PreScouter

PRESCOUTER PROVIDES CUSTOMIZED RESEARCH AND ANALYSIS

PreScouter helps clients gain competitive advantage by providing customized global research. We act as an extension to your in-house research and business data teams in order to provide you with a holistic view of trends, technologies, and markets.

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CLIENTS RELY ON US FOR:

Innovation Discovery: PreScouter provides clients with a constant flow of high-value opportunities and ideas by keeping you up to date on new and emerging technologies and businesses.

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