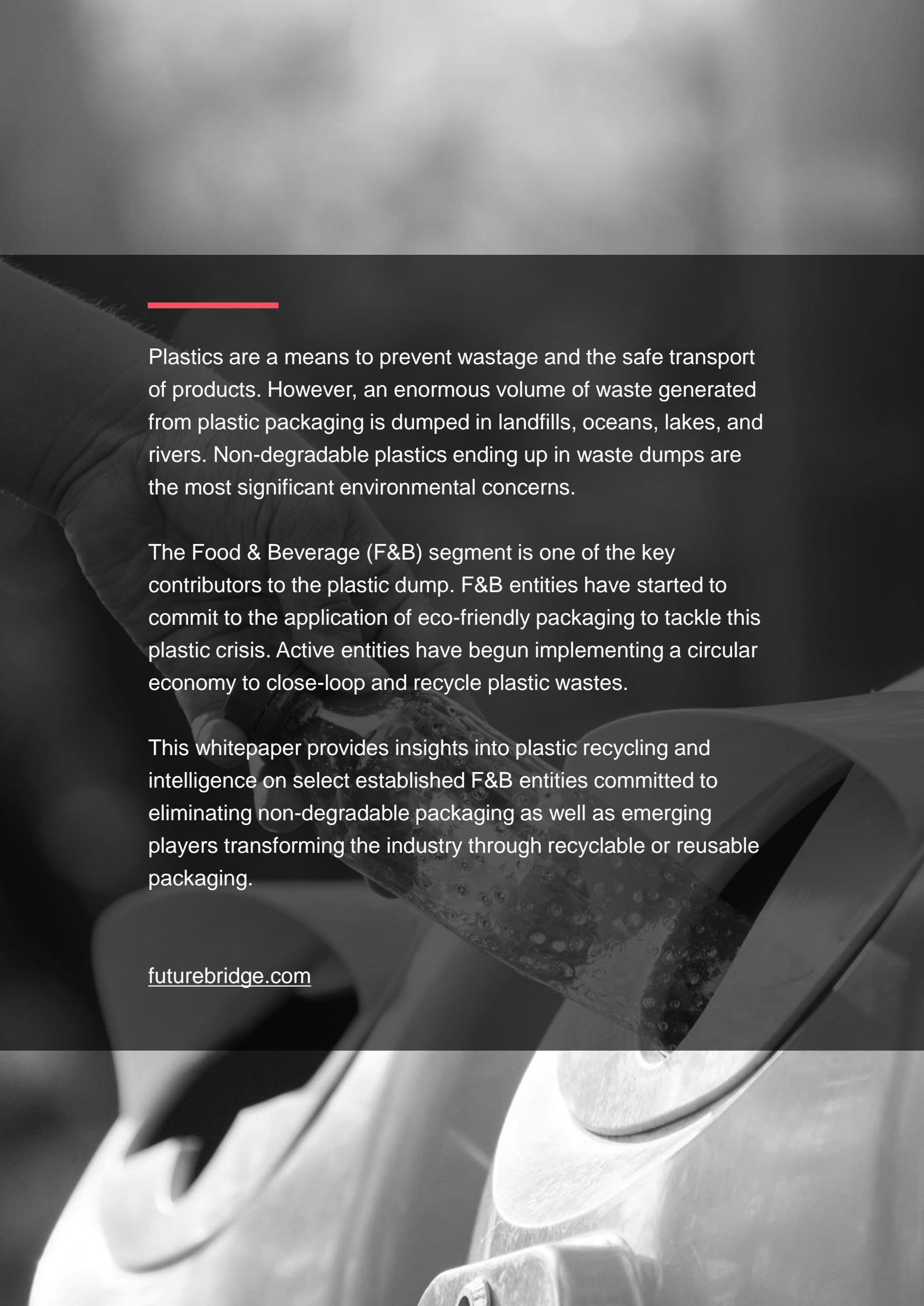




WHITE PAPER

Plastic Recycling – To Prevent our Globe from Drowning in Plastic

FutureBridge

A black and white photograph of a hand holding a glass bottle with condensation on it. The background is dark and out of focus. A red horizontal line is positioned above the first paragraph of text.

Plastics are a means to prevent wastage and the safe transport of products. However, an enormous volume of waste generated from plastic packaging is dumped in landfills, oceans, lakes, and rivers. Non-degradable plastics ending up in waste dumps are the most significant environmental concerns.

The Food & Beverage (F&B) segment is one of the key contributors to the plastic dump. F&B entities have started to commit to the application of eco-friendly packaging to tackle this plastic crisis. Active entities have begun implementing a circular economy to close-loop and recycle plastic wastes.

This whitepaper provides insights into plastic recycling and intelligence on select established F&B entities committed to eliminating non-degradable packaging as well as emerging players transforming the industry through recyclable or reusable packaging.

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Introduction

Packaging is an integral part of products, which creates a bridge between the manufacturers and their customers. Packaging helps preserve and protect the product, communicate the brand image, convey information, and offer convenience. However, non-degradable and packaging waste has negative environmental consequences:

- Addition of carbon footprint
- Entry in the food chain through seafood or soil absorption, which may/may not result in **health issues**

An **environmental-friendly approach**, like **renewable packaging**, has become an **inevitable** initiative in the consumer marketplace to overcome these impacts.

Eco-friendly packaging solutions include:

- Use of biodegradable plastics
- Use of plant-based plastics
- Post-consumer recycled polyethylene bags made from recycled waste

A. The Current Economy of Plastic

About 90% of raw plastic is produced from fossil fuels (oil or natural gas), which is provided to plastic manufacturers to manufacture packaging by using injection, blow molding, or heat forming. These plastics are then sold to brand owners and retail entities. Post-consumer use, plastic waste is dumped into landfills, oceans, lakes, and rivers depending on the waste management process of individual regions.

Large volumes of plastic waste are recycled locally in the producer country or surrounding countries. However, bulk quantities of plastic waste have been exported to China from developed economies.

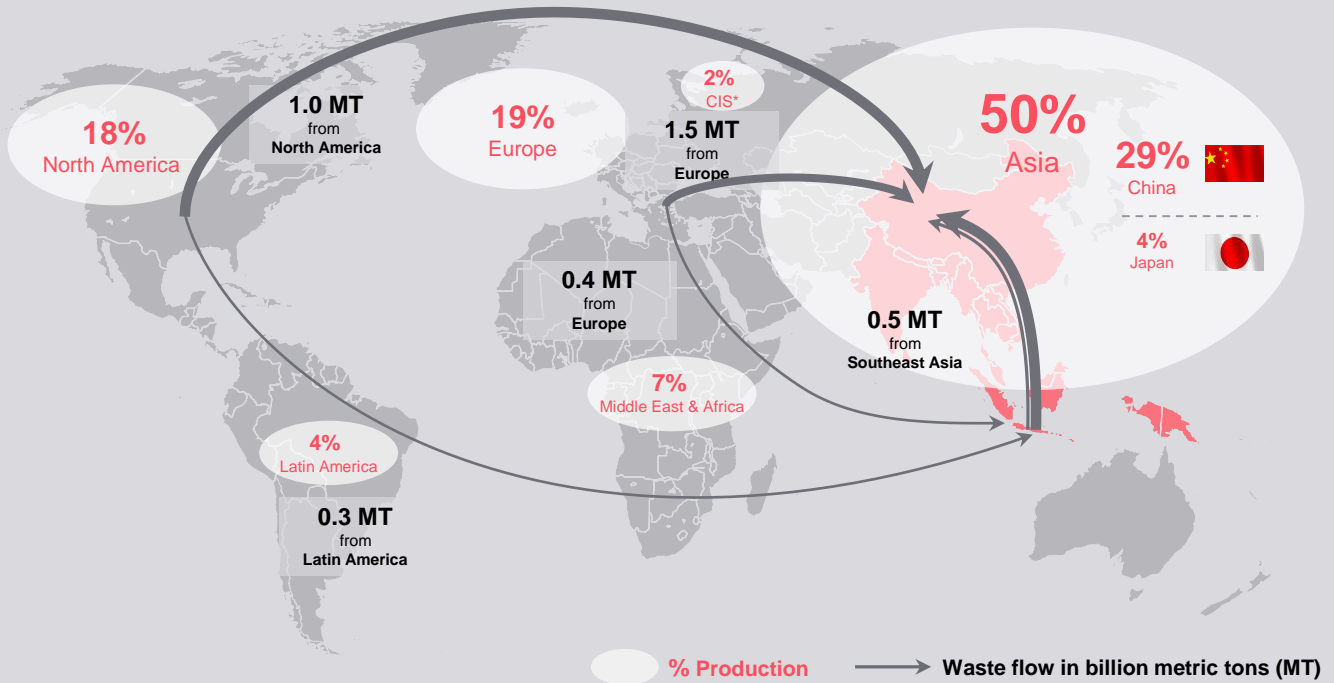
As depicted in *Exhibit 1*, Asia is the largest producer of plastics, and ultimately vast volumes of plastics are exported back to China for recycling. Recently, the Chinese market is in the transitory phase with the implementation of the Chinese government ban on import of post-consumer waste. The ban on waste import has led to the emergence of new markets in the neighboring regions of Southeast Asia that are recycling plastic waste.

The **foreseeable positive impact** of the China ban includes:

- The advent of **recycling technology**
- The encouragement of **local recycling**

EXHIBIT 1: Breakdown of Global Plastics Production and Plastic Waste Flow before China's Ban

Plastic waste was predominantly dumped in China prior to the ban on the import of post-consumer waste in January 2018. Recently, due to China's ban, new markets have emerged in Southeast Asia for recycling of plastics.



Note: *CIS: Commonwealth of Independent States

Source: [Fact Reports](#), UN Comtrade, Breakdown of Global Plastics Production

B. Drivers of Recycled Plastic Industry

The plastic recycling industry is in its early stages of development. Large and small corporations in each country are working to consolidate to scale-up and increase their efficiency and capacity.

Regulators are working to help create a promising plastic recycling framework, thereby encouraging its design, collection, sorting, and inclusion of recycled plastic in products. For example, in October 2018, the European Parliament voted mandatory addition of at least 35% recycled plastic in beverage containers by 2025.

Recyclers, along with product manufacturers and retail chains, have started to collaborate and work on overcoming any technical, psychological, and economic limitations that may impact the recycled plastic industry. Consumer pressure on products is one of the decisive factors that influence the use of eco-friendly plastics. As a result, brand owners have initiated sustainable approaches and engaged consumers to understand the steps undertaken by entities related to environmental issues.

Contribution of F&B Industry in the Plastic Recycling Industry

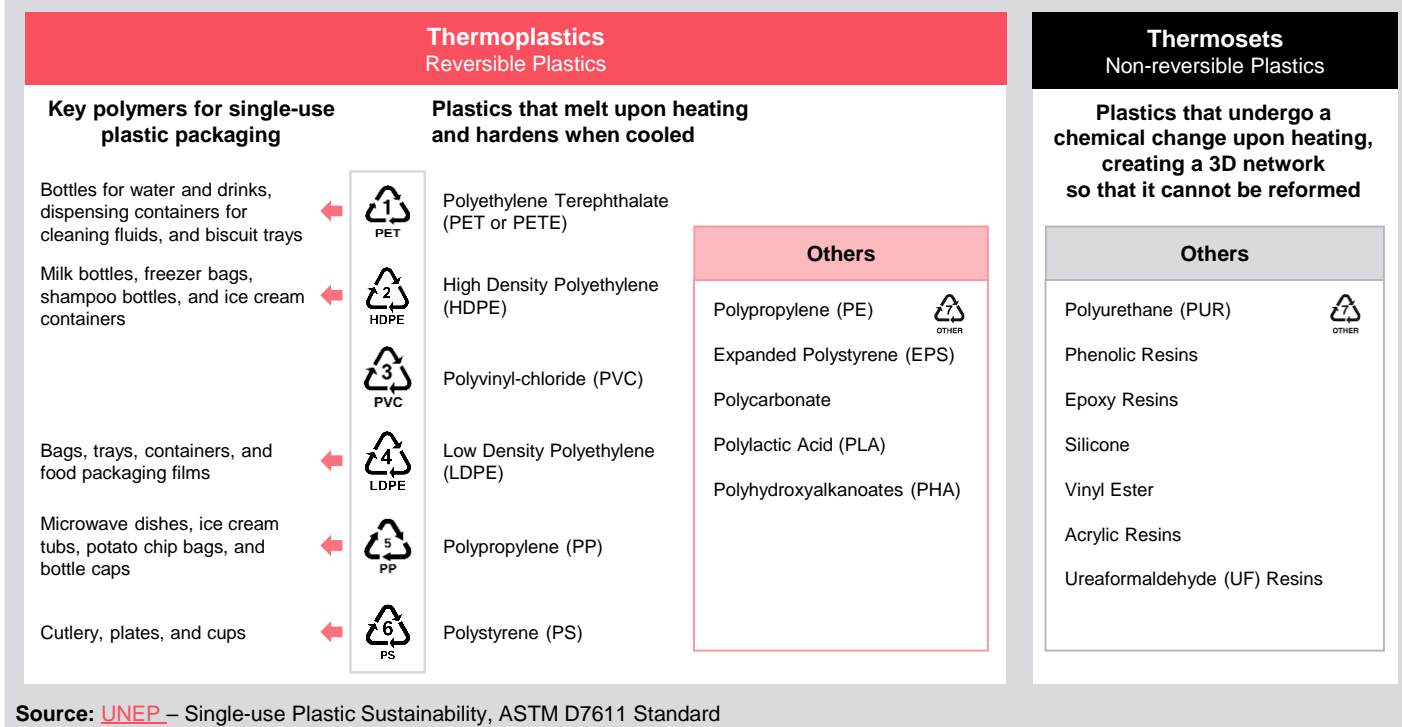
A. F&B Industry Overview

F&B packaging accounts for almost two-thirds of the total packaging waste. Regulatory authorities have been scrutinizing the F&B sector to check the application and disposal of single-use plastics.

With the growing literacy rate and consumer awareness on the impact of plastics, concerns have also been growing for the availability of plastic bags, straws, single-use plastics. Consumers are keen to hold businesses and their packaging standards responsible for their impact on the environment. As a result, established players are presently more focused on producing and packaging their products responsibly.

Exhibit 2 showcases major categories of plastics and their single-use application.

EXHIBIT 2: Categories and Classification of Plastics



According to a [consumer survey](#) conducted by WestRock, a paper and packaging supplier, 74% of consumers mentioned that materials used in packaging are an essential way through which a company shows its interest and support for the environment.

There is no doubt that plastics are essential to protect products and extend their shelf-life. However, the waste generated is enormous, and there is no clear solution to tackle the plastic waste issue. As a result, the food sector needs to combine several approaches to solve the problem.

The food sector can work on the following strategies, as depicted in *Exhibit 3*, to resolve concerns in plastic management:

1. Using lightweight packaging
2. Increasing the use of packaging with a high concentration of recycled materials
3. Improving recyclability
4. Introducing bio-based and/or biodegradable plastic
5. Transforming non-reusable to reusable packaging
6. Researching on plastic alternatives

EXHIBIT 3: Methods to Solve the Plastic Problem in F&B Sector

	Method to Solve Plastic Issue	Reduce Plastic Volumes		Reduce the Use of Fossilized Raw Material	Recycled Plastic Management
		#Kilos	Amount		
	Using lightweight packaging				
	Increasing the use of packaging with high concentration of recycled materials				
	Improving recyclability				
	Introducing bio-based and/or biodegradable plastic				
	Transforming non-reusable to reusable packaging				
	Researching on plastic alternatives				










Positive impact
 No effect
 Negative impact

Source: [The Plastic Puzzle](#)

B. Initiatives by F&B Players – Demand Drivers of Plastic Packaging

Established as well as small F&B players active in retail, as well as HORECA, have started to use recyclable plastics for packaging. *Exhibit 4* illustrates examples of F&B players that have committed to implement sustainable packaging.

EXHIBIT 4: Initiatives and Commitments by Established F&B Players

 <p>Committed to transform 100% of its package materials to recyclable or reusable by 2025</p>	 <p>Ensuring that 100% of its plastic packaging is fully reusable, recyclable, or compostable by 2025 and sourcing 25% of its resin from post-consumer recycled content</p>	 <p>Pledged to increase recycled content in water bottles from the current 25% to 100% by 2025</p>
 <p>Announced reduction of share of non-recycled plastic in the packaging of its beverages by 35% by 2025</p>	 <p>World Without Waste initiative pledged that packaging will contain 50% recycled content by 2030</p>	 <p>Opted for recyclable, biodegradable, and compostable plant-based packaging for every delivery order of avocado toast, iced coffee, and house-made granola</p>
 <p>Recycling in place at 36,000 locations by 2025</p>	 <p>Initiated NextGen Cup Challenge that aimed at redesigning the fiber to-go cup to create a widely recyclable or compostable alternative</p>	 <p>Initiated the use of paperboard tray by WestRock with a grease-barrier, and intends to transform all its consumer-facing plastic packaging to reusable/recoverable by 2025</p>

Source: Company Websites, Press Releases - [Nestlé](#), [PepsiCo](#), [Unilever](#), and [Journal Report](#)

C. Initiatives by Industry Drivers – Start-ups and Technology Developers

Technology developers are focusing on the advancement of technologies that can help in accelerating the use of recycled packaging. Paper bottles can be efficient alternatives for single-use Polyethylene Terephthalate (PET). Paper packaging has gained attention from technology developers. However, constraints of using paper packaging include durability, leakage, and recyclability.

Technology developers are investing in research to replace plastic film coatings of paper packaging with bio-based coating materials. One of the leading packaging players, Amcor, introduced [Paperly](#) range that demonstrates high-barrier and re-closable properties to maintain the freshness of packed goods, as depicted in *Exhibit 5*.

EXHIBIT 5: Illustrative Solutions by Technology Developers

  <p>PAPERLY</p> <ul style="list-style-type: none"> Thermoformable packaging material made with paper, Polyethylene (PE) packaging, and Ethylene Vinyl Alcohol (EVOH) Available in Europe 	 <p>PAPER WATER BOTTLE</p> <ul style="list-style-type: none"> The pulp (65%) comprise of combination of wheat straw, bamboo, husks, sugar cane, and/or bulrush The barrier coating is 35% ENSO RESTORE PET The product is also available in rPET and Ocean-bound rPET 	 <p>PAPER BOTTLE</p> <ul style="list-style-type: none"> The company developed 100% recyclable paper bottles To increase its barrier property, a preliminary plastic barrier film is being used
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Source: Company Websites - [Paperly](#), [Paper Water Bottle](#), and [Paper Bottle](#) Company

Closed-loop Strategy to Prevent Plastic Crisis

Food producers and retailers need to collaborate with entities having several areas of expertise to improve the management of plastic packaging by creating a strategy and measurable goals at the company level.

Corporates are progressively exploring the Circular Economy Model to achieve sustainable development. It is a multi-level approach for the transition to a circular closed-loop system that helps minimize the intake of natural resources. This approach needs to focus on reviewing each packaging case with the entity, and then, justifying the choice of materials to their customers. Entities also need to provide a complete knowledge of recycling systems and plastic chains.

The circular economy business model aims to replace the "end-of-life" product concept to re-use, recycle, or reduce consumption of materials in manufacturing, distribution, or consumption process and attain sustainability development.

This model is also applicable to the sustainable packaging industry. Collaborative efforts by corporates, academics, and policymakers, as depicted in *Exhibit 6*, can efficiently regulate the production and re-use of single-use/disposable plastics in the global market.

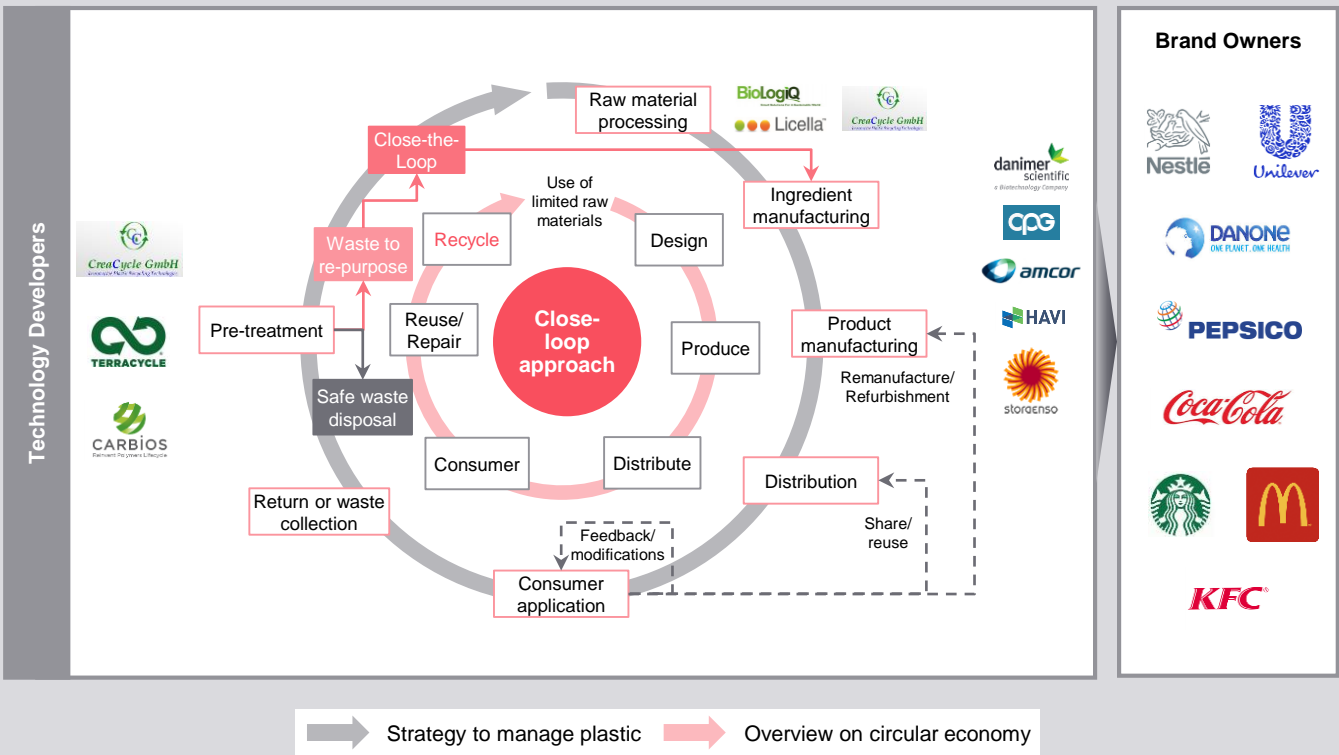
Exhibit 6 shows that technology developers are investing in research to introduce technologies, which can be used for the repurposing of plastic waste and reformulating plastics to help in closing the open loop of plastics waste management. However, the closed-loop is also dependent on the efficient waste collection by players, such as Terracycle, and introducing it for pre-treatment and re-use.

Further, players such as CreaCycle, have designed solutions specifically for brand owners like Unilever. These collaborations help introduce solutions that meet the demands of both customers as well as consumers.

Regulatory bodies and policymakers also play a significant role in the industry, responsible for implementing the plastic ban or enforcing policies to add a levy on plastic packaging. *Exhibit 6* also illustrates a few indicative policies implemented in select countries.

EXHIBIT 6: Building Strong Recycling Channel to Bring a Closed-loop Economy to the Packaging Industry

Policies & Regulations	Brazil 🇧🇷 Circular economy transition	India 🇮🇳 Strategy on paper resource efficiency	Austria 🇦🇹 Levy on plastic bags in key supermarkets	Luxembourg 🇱🇺 “Eco-sac” (“Öko-Tut”) initiative	Spain 🇪🇸 Voluntary agreement to reduce plastic carrier bags	Australia 🇦🇺 Key supermarkets will phase out lightweight plastic bags
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Source: [Whitepaper](#), [UNEP](#) – Single-use Plastic Sustainability, Ellen MacArthur Foundation 2013, Murray et al. 2015, Kirchherr et al. 2017

References

1. [Plastics recycling worldwide – Current overview and desirable changes](#)
2. [UNEP: Single-use Plastic Sustainability](#)
3. [Taming the Tsunami of Plastic Waste](#)
4. [Throwaway culture has spread packaging waste worldwide: here's what to do about it](#)
5. [A Wider Circle? The Circular Economy in Developing Countries](#)
6. [The Plastic Puzzle – Dec 2019](#)

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