

Shifting Our Fate with Plastics From a Linear to Circular Economy

WI COR 2021
Tonya Randell



Tracking Plastic Recycling to drive better policy, innovation, & action!

 U.S. SENATE COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS



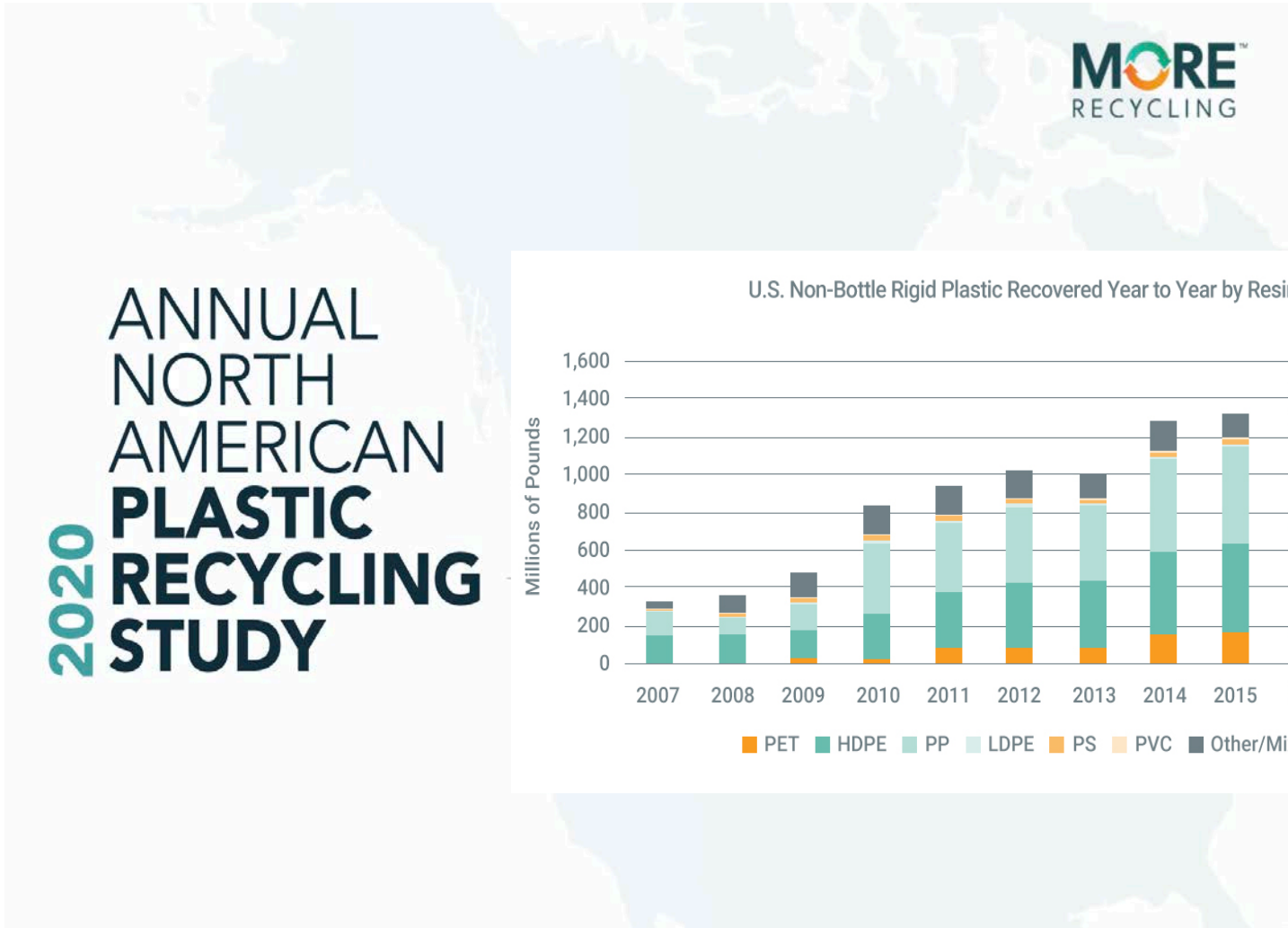
LIVE NOW

Nina Bellucci

Responding to the Challenges Facing Recycling in the United States

JUNE 17, 2020

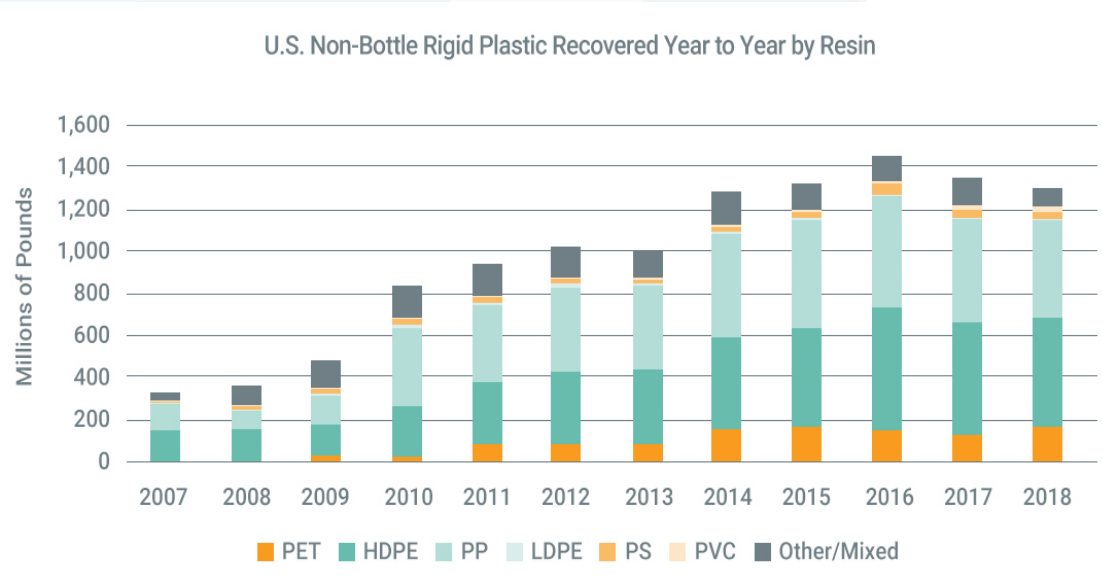
The Senate Committee on Environment and Public Works will hold an oversight hearing entitled, "Responding to the challenges facing recycling in the United States."



MORE RECYCLING

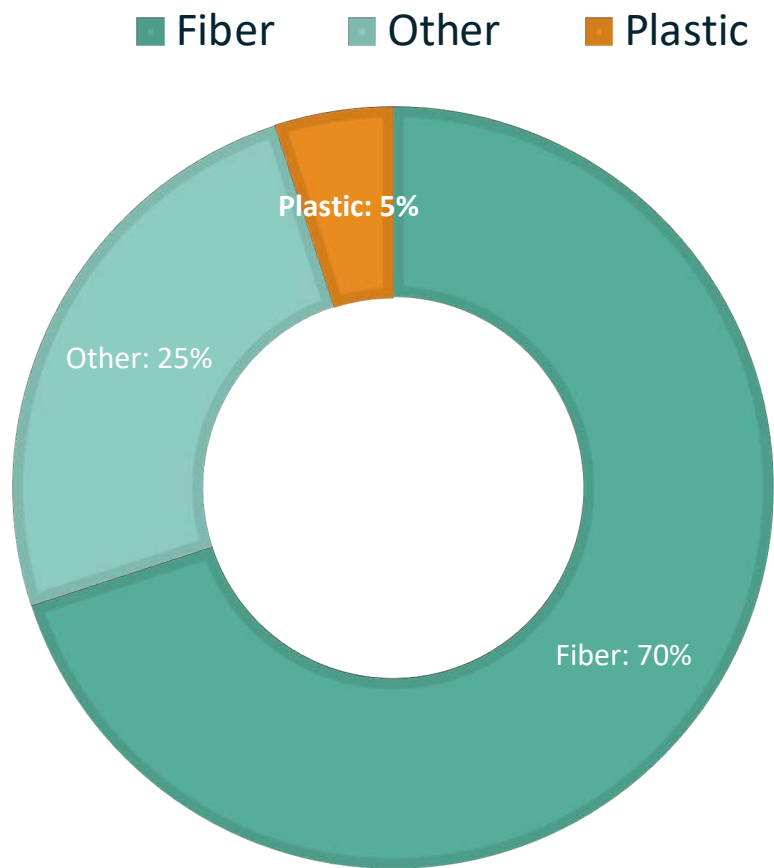
2020 ANNUAL NORTH AMERICAN PLASTIC RECYCLING STUDY

U.S. Non-Bottle Rigid Plastic Recovered Year to Year by Resin



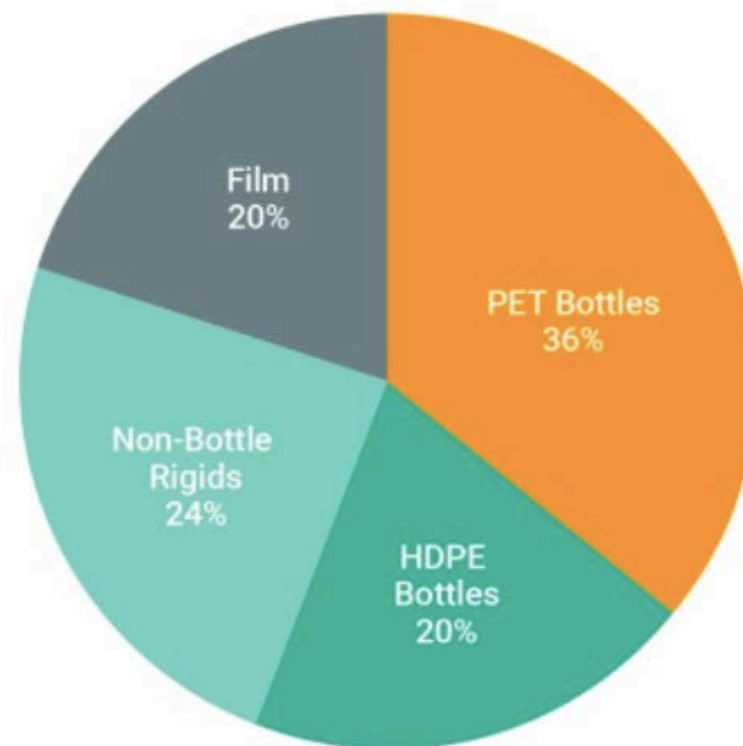
Year	PET	HDPE	PP	LDPE	PS	PVC	Other/Mixed
2007	100	100	100	100	100	100	100
2008	100	100	100	100	100	100	100
2009	100	100	100	100	100	100	100
2010	100	100	100	100	100	100	100
2011	100	100	100	100	100	100	100
2012	100	100	100	100	100	100	100
2013	100	100	100	100	100	100	100
2014	100	100	100	100	100	100	100
2015	100	100	100	100	100	100	100
2016	100	100	100	100	100	100	100
2017	100	100	100	100	100	100	100
2018	100	100	100	100	100	100	100

Background: Plastic Mix in the MRF Recycling Stream



Material Collected at MRF

U.S. Postconsumer Plastic Recycled in 2018



Change from 2017 to 2018 (estimated, in pounds)

PET	+ 87M
HDPE Bottles	- 35M
Non-Bottle Rigid	- 47M
Film	- 4M



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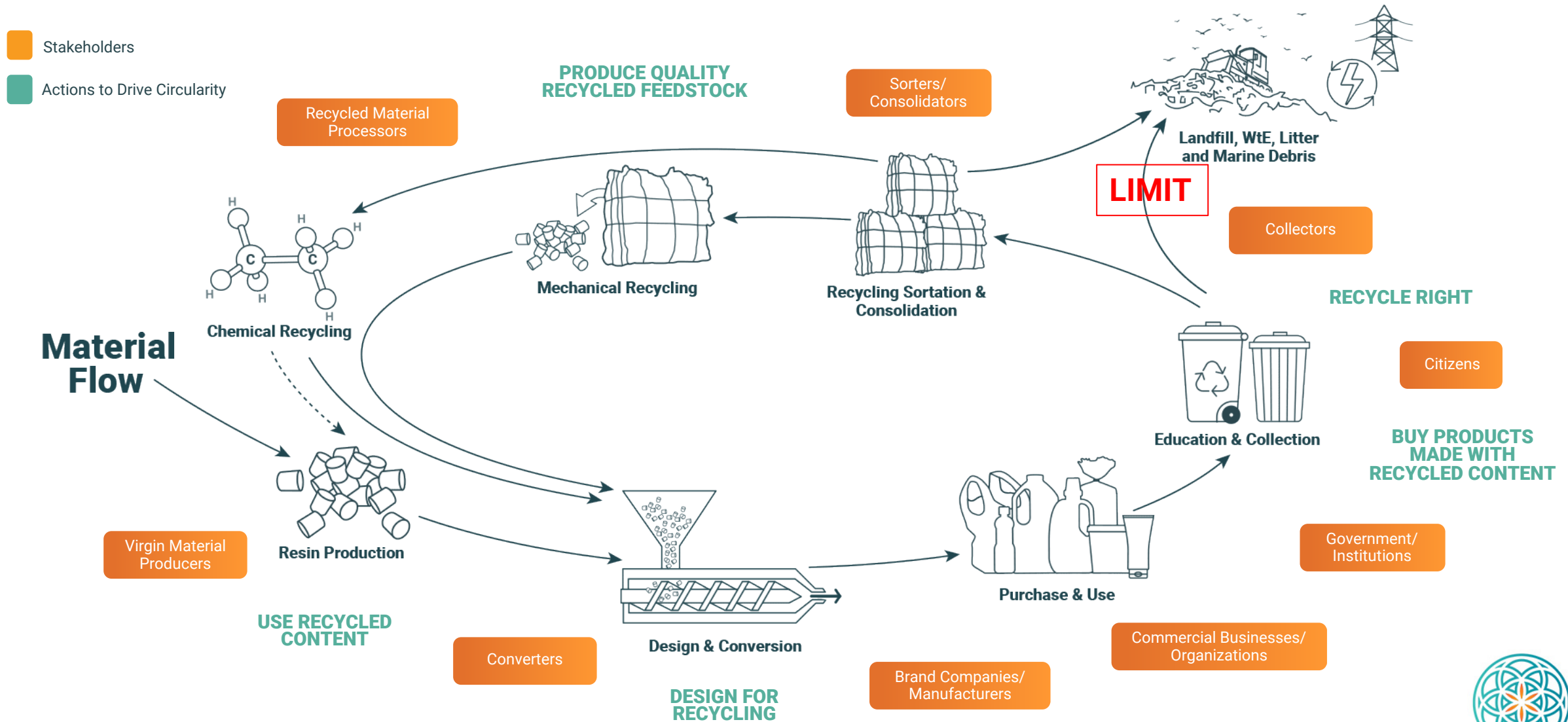
What is Circularity? (and why does it matter?)

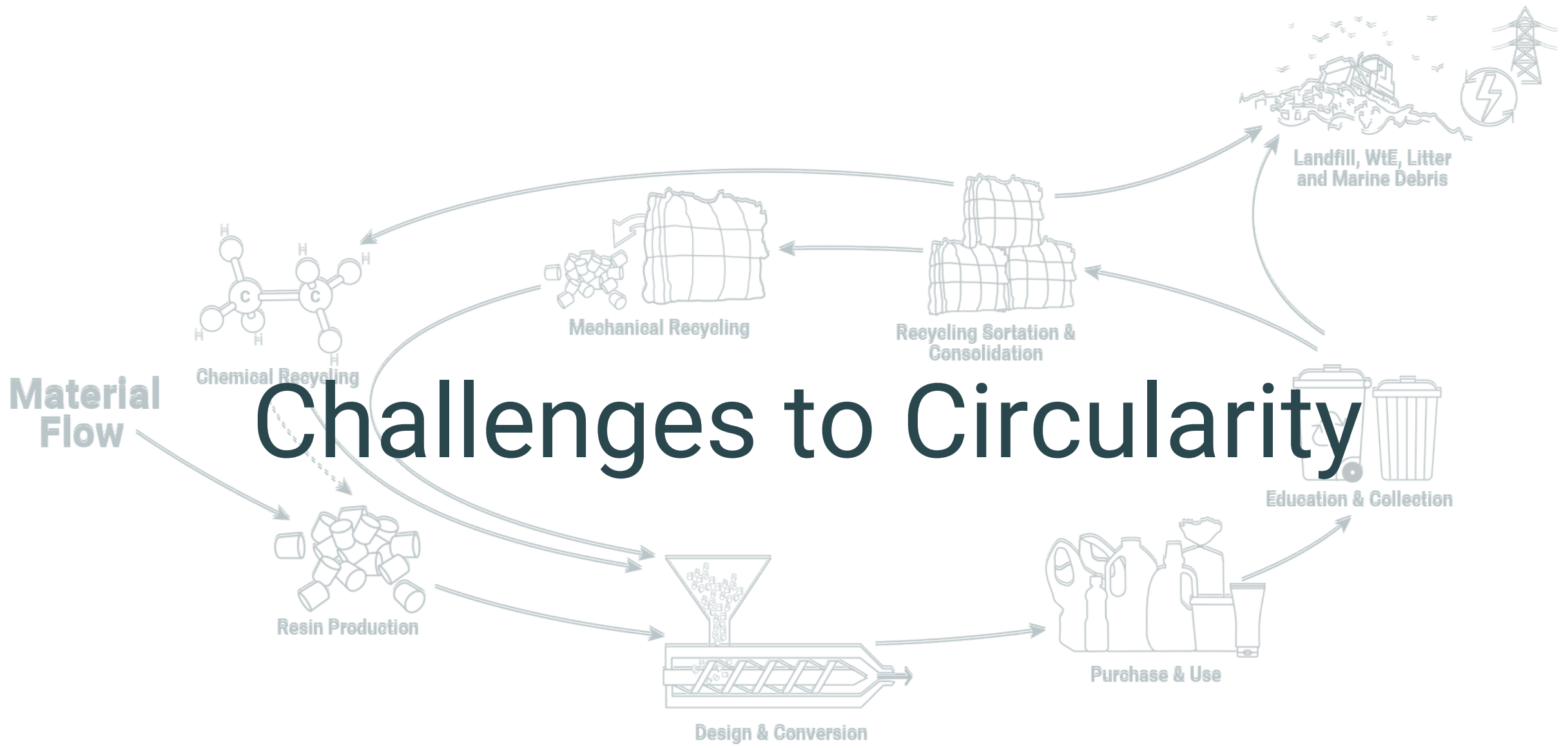
- [KennisKaarten]: **Circularity focuses on resource cycles, while sustainability is more broadly related to people, the planet and the economy.** Circularity and sustainability stand in a long tradition of related visions, models and theories.
- [US Chamber of Commerce]: **The practice of circularity is...a human construct designed to support the conversion of raw materials for human consumption beyond simple survival needs of food and water.** The intentional design of a system is what separates circularity from sustainability.
- [Ellen MacArthur Foundation]: A circular economy aims to redefine growth, focusing on positive society-wide benefits. **It entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system.** Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles:
 - Design out waste and pollution
 - Keep products and materials in use
 - Regenerate natural systems



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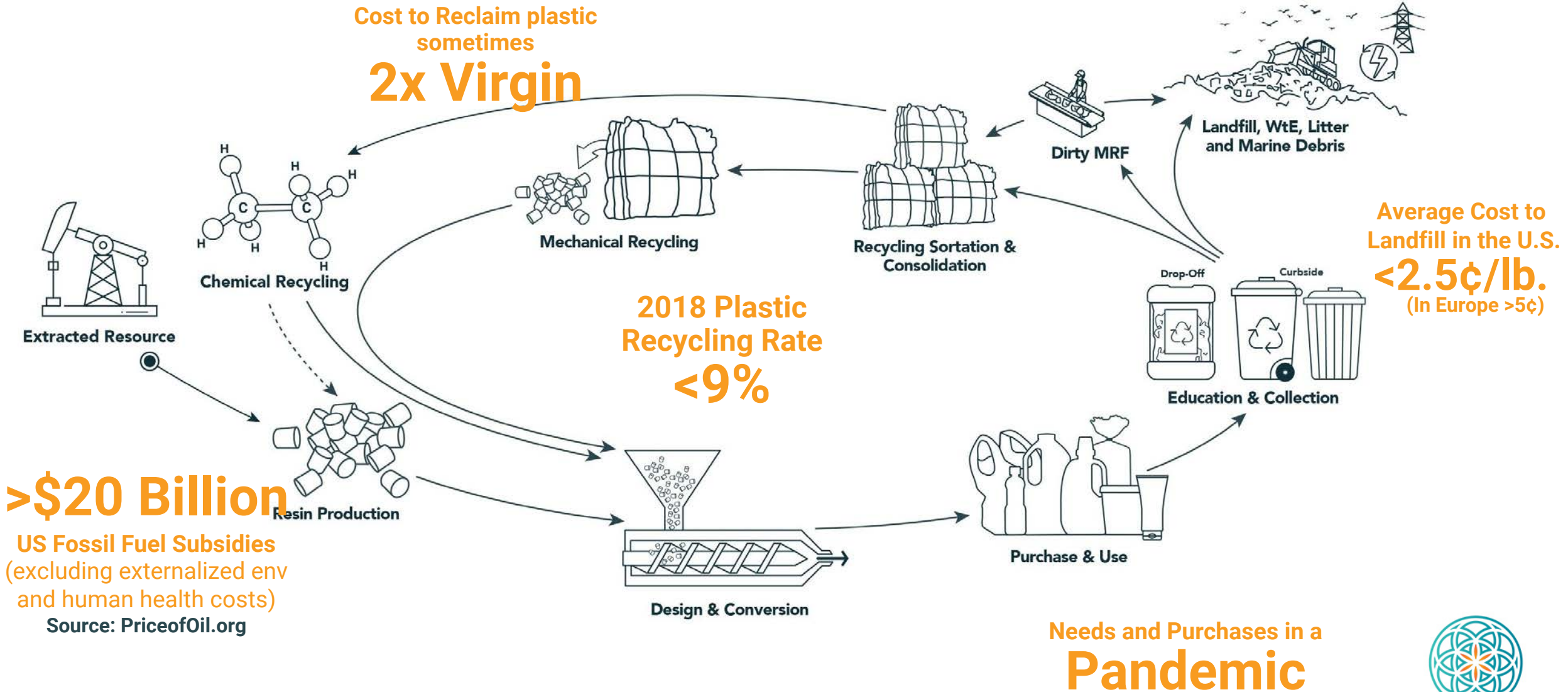
Successful Recycling is a Part of Circularity



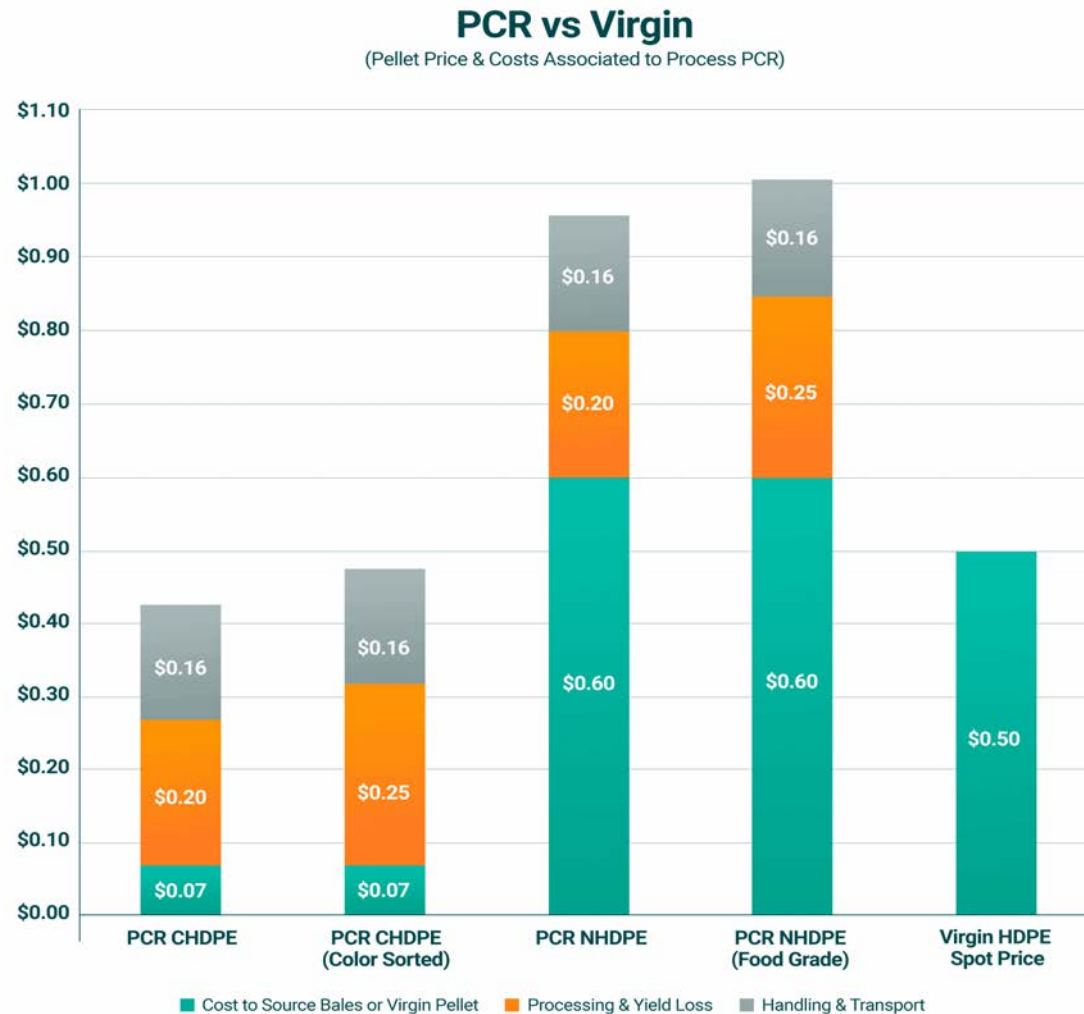


Challenges to Circularity

Barriers Throughout the Value Chain for Plastic Circularity



Recycled Plastic Is More Expensive than Virgin Plastic/Resin



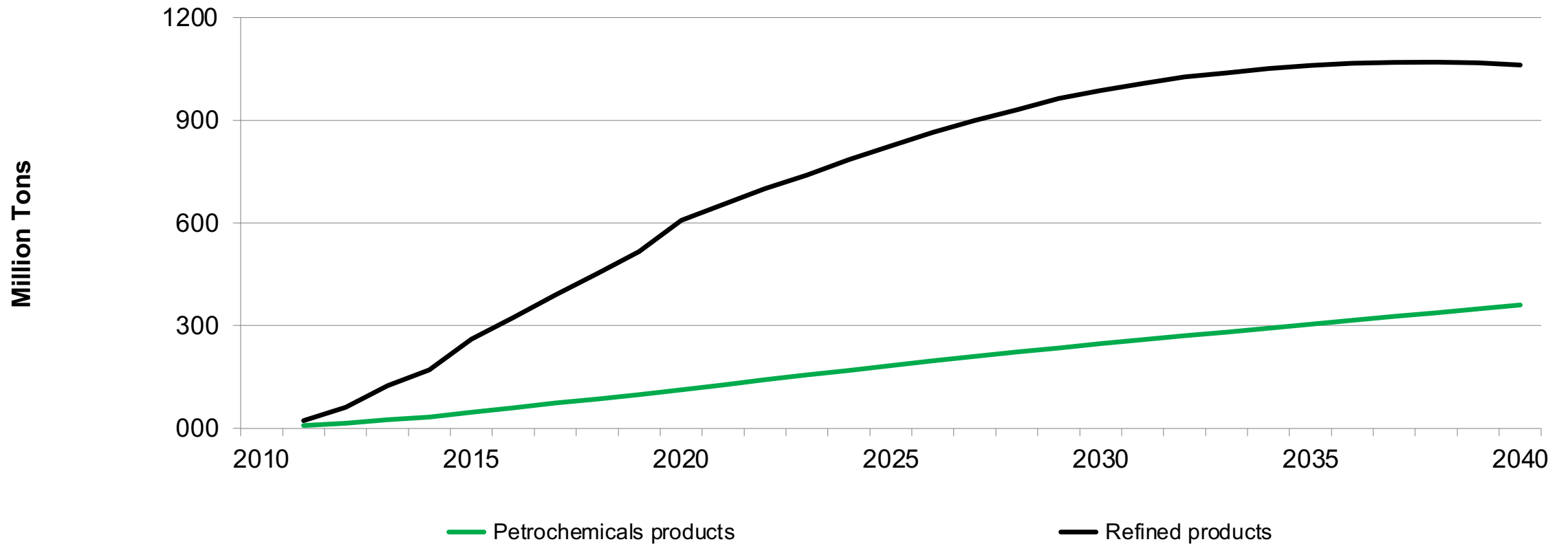
Recycling processes can't be expected to close the price gap completely.

PCR CHDPE = Postconsumer Resin colored High Density Polyethylene

PCR NHDPE = Postconsumer Resin natural (colorless) High Density Polyethylene

Predicted Future Growth in Plastic Relative to Oil and Gas

Petrochemicals and refined products markets, cumulative



Source: IHS Markit

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Thanks to ISH Markit for stats and charts from NEW Study:
Changing Course: Plastics, Carbon, and the Transition to Circularity



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Covid-19 Catalyst for Plastic Production – from Virgin



- Medical and pharma driving growth in demand for plastics (PPE, in particular)
- Accelerated adoption of E-commerce in retail, food, home goods, etc.
- Balance between supporting local restaurants for take-out with waste produced

Source: <https://www.cdc.gov/patientsafety/features/before-surgery.html>



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Plastic Paradox – Trading off growth in GHG emissions to avoid plastic waste

Plastic Paradox

GHG Savings

Use of plastics cuts food waste & fuel consumption, reducing GHG emissions and therefore mitigating climate change

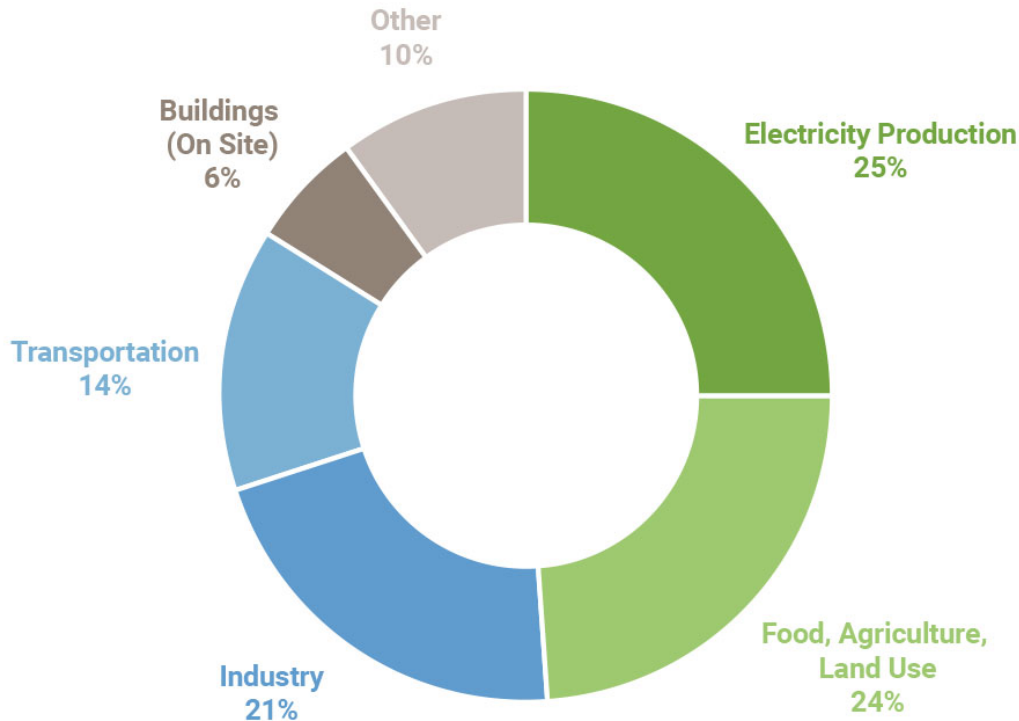


Plastic Waste

Use of plastics creates massive pollution, severely harming the planet

Can we decrease GHG emissions AND curb plastic waste?

Greenhouse Gas Sources

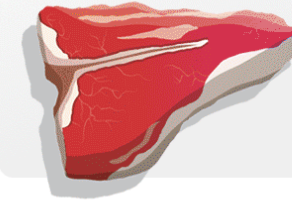


Source: IPCC WG3



Examples of Plastic Packaging Innovation

Beef Packaging



ORIGINAL
Polystyrene foam tray
with cling wrap

NEW
Vacuum packing in
oxygen barrier film

RESULT
Shelf life
extended from
4 days up to
30 days

Grapes Packaging



ORIGINAL
Sold loose

NEW
Perforated plastic bags

RESULT
Bagging
leads to 20%
reduction in
in-store waste

Source: 2016 American Chemical Society

What are the trade-offs of alternatives?
What's needed to shift consumption patterns?

Essential to Transition from a Linear to a Circular Economy

Linear System



Take

Make

Waste

Climate Change

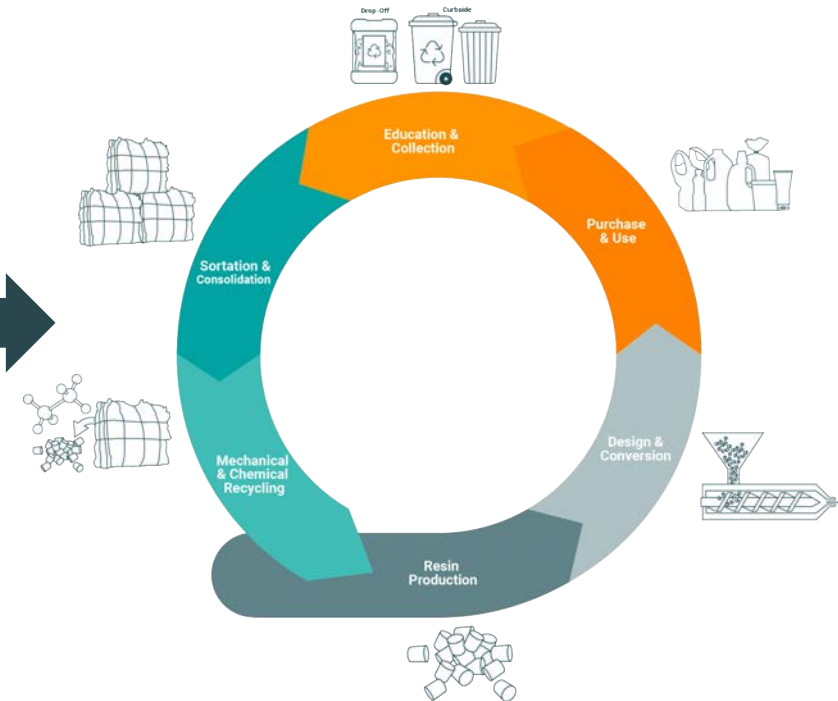
Waste



Better Data for Better Policy & Decisions in the Transition to Circularity

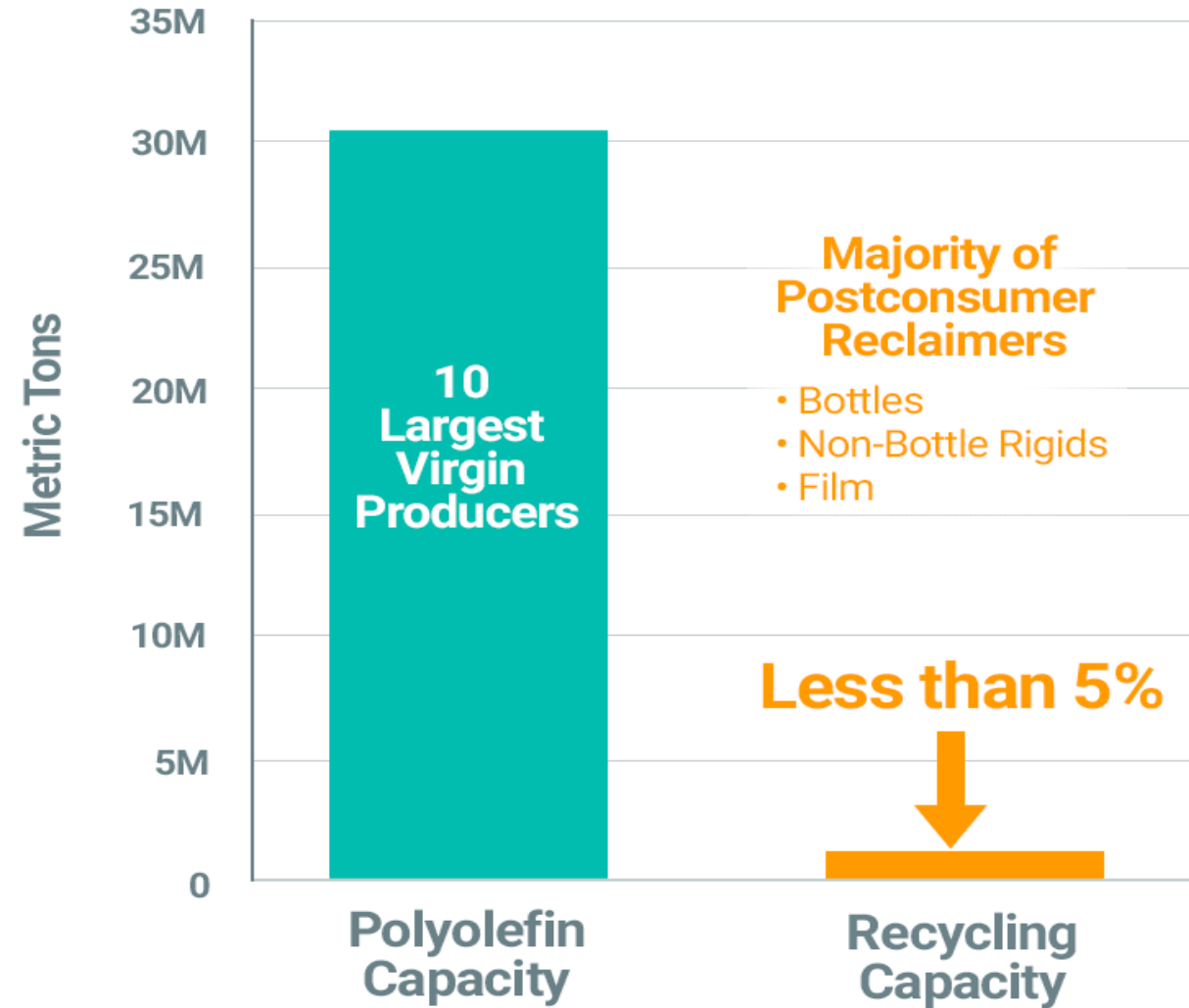


Circular System



Solutions need to be on same scale as the problem

U.S. Polyolefin Capacity



Source: IHS Markit and More Recycling

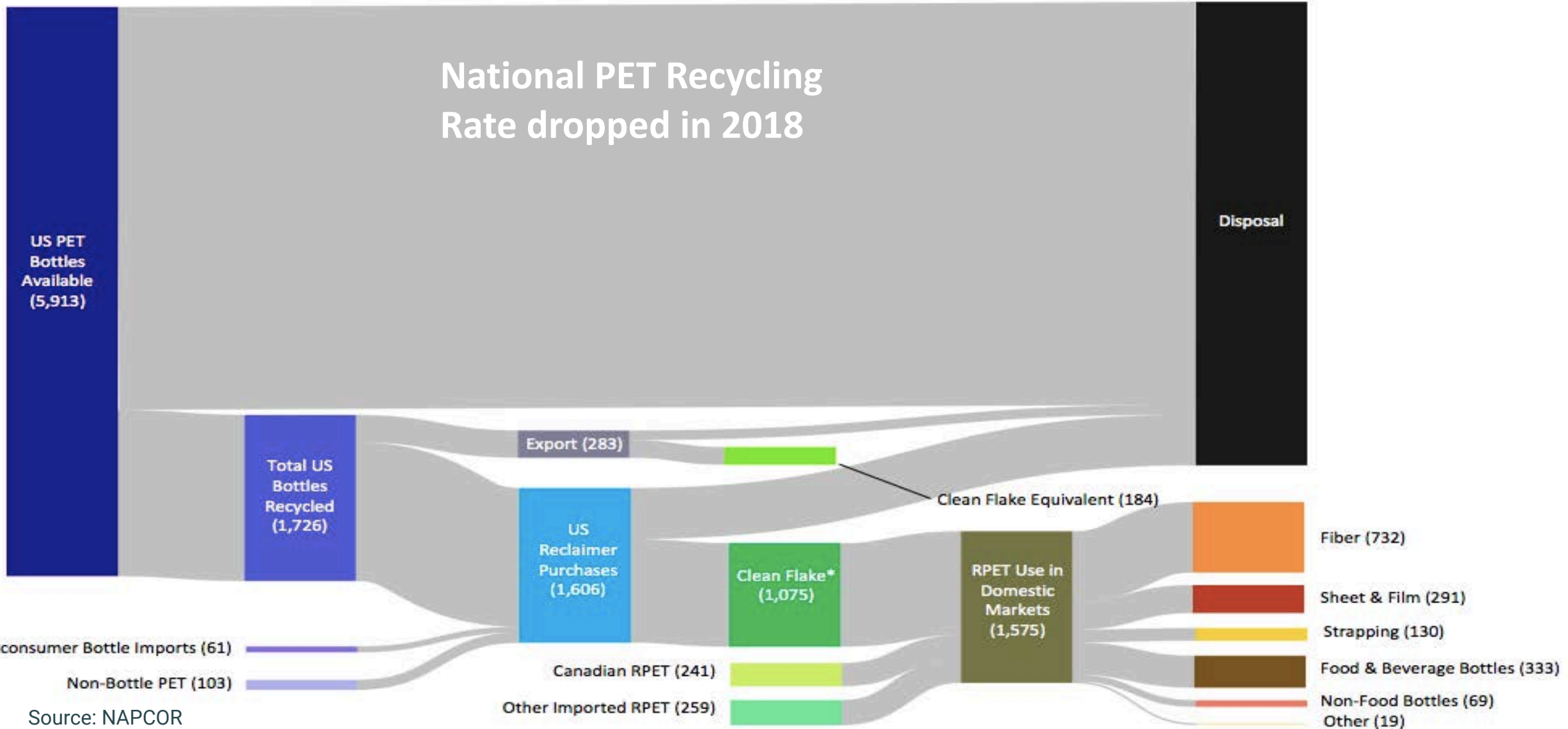
Note: Approximate figure includes existing reclamation capacity in 2019. It does not include announced future capacity.

Where to Start? Consider PET Recycling



FIGURE 1: PET Material Flows in the US (MMlbs)

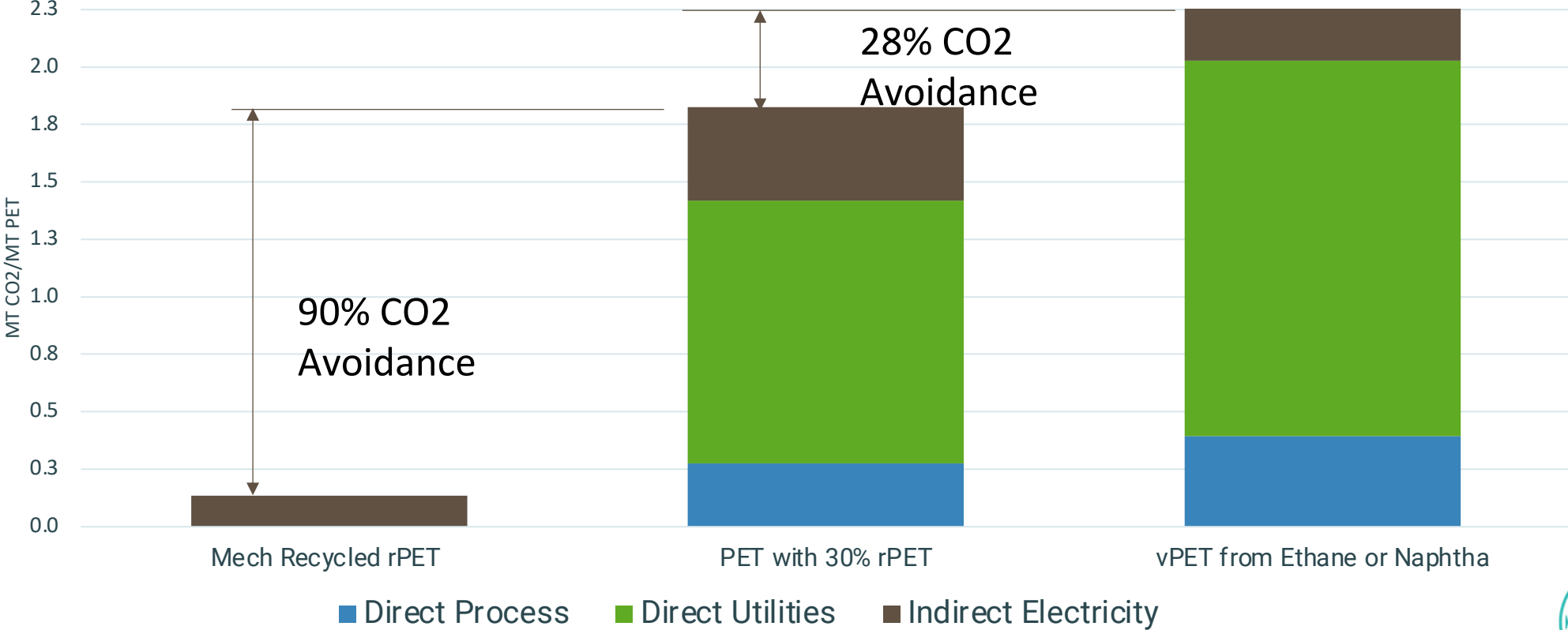
National PET Recycling Rate dropped in 2018



Source: NAPCOR

Recycling is Critical to Climate Action

Carbon Avoidance of Mechanical Recycling of PET



Source: IHSMarkit



US Plastics Pact

- Companies, governments, and others **working together to meet goals by 2025.**
- **Goal that plastics never become waste.**
 - Eliminate certain 'problematic/unnecessary' packaging
 - Innovates so that 100% packaging is reusable, recyclable or compostable
 - Drive use of recycled content or responsibly sourced bio-based plastic
- **Keep plastics out of environment and in the circular economy**

www.usplasticspact.org



One product can have big impact on demand

6 BILLION POUNDS: TOTAL WEIGHT OF PE USED IN ANNUALLY IN U.S. TRASH BAG PRODUCTION

The impact if different levels of PCR were used in the sector:

PCR level	Pounds of recycled resin needed	Portion of total volume of PE currently reclaimed in U.S.	Metric tons of CO2 equivalent avoided
10 percent	600 million	32 percent	270,276 (equal to emissions of roughly 58,000 cars in one year)
30 percent	1.8 billion	95 percent	810,828 (equal to 173,000 cars)
70 percent	4.2 billion	222 percent	1,891,831 (equal to 403,000 cars)
97 percent	5.8 billion	308 percent	2,621,277 (equal to 558,000 cars)

Numbers were tabulated by More Recycling using information from several private reports as well as the U.S. EPA's WARM calculator and extrapolation of California's most recent waste characterization study.

Data sort is produced each quarter by More Recycling. For additional information, go to morerecycling.com





Circularity inAction.com™

Better Policy. Greater Innovation. More Action.

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Clearinghouse of Tools to Support Efforts Around the Value Chain



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OUR ROLES IN THE VALUE CHAIN

When a value chain aligns around a resources lifecycle, the foundation for circularity, we reduce waste and drive efficient use of resources.

RECYCLE RIGHT
Citizens
Government/Institutions

BUY PRODUCTS MADE WITH RECYCLED CONTENT
Commercial Business/Organizations

DESIGN FOR CIRCULARITY
Brand Companies

USE RECYCLED CONTENT
Converters
Virgin Material Producers

PRODUCE QUALITY RECYCLED FEEDSTOCK
Recycled Material Processors

BUSINESS OF RECYCLING
Sorters/Consolidators

COLLECTORS

VIEW TOOLS

VIEW TOOLS

VIEW TOOLS

Circularity In Action Success Stories >
Get inspiration from value chain stakeholders aligning to put circularity in action.

CONTINUE



https://www.ezview.wa.gov/site/alias_1962/37615/plastics_packaging_study_stakeholder_group.aspx

Key Takeaways from Recommendations Document:

- **You can track what you can't measure-** Agency action to strengthen data collection
- **There is no single solution** to solve all plastic recycling and waste problems
 - EPR, Deposit System, & Recycled Content Requirements
 - Bans on problematic or unnecessary packaging
 - Develop and adopt reusable packaging systems
- Setting **high targets drive innovation** when not overly prescriptive



Recommendations for Managing Plastic Packaging Waste in Washington

Prepared for the Washington State Department of Ecology

September 14, 2020

Collaboration across the value chain

Plastic Recycling Decision Tree

Confirm the key 3 fundamental elements in the recycling infrastructure are in place to facilitate recycling of your package, then you can encourage consumers to recycle your package.

Availability of Recycling (Recycling Program Availability)

Can the packaging format be collected to be processed for recycling

Recycling Program Availability

Adequate percentage of the population has recycling programs available that accept the packaging format

Technical Recyclability (Market Compatibility and Consolidation for Market)

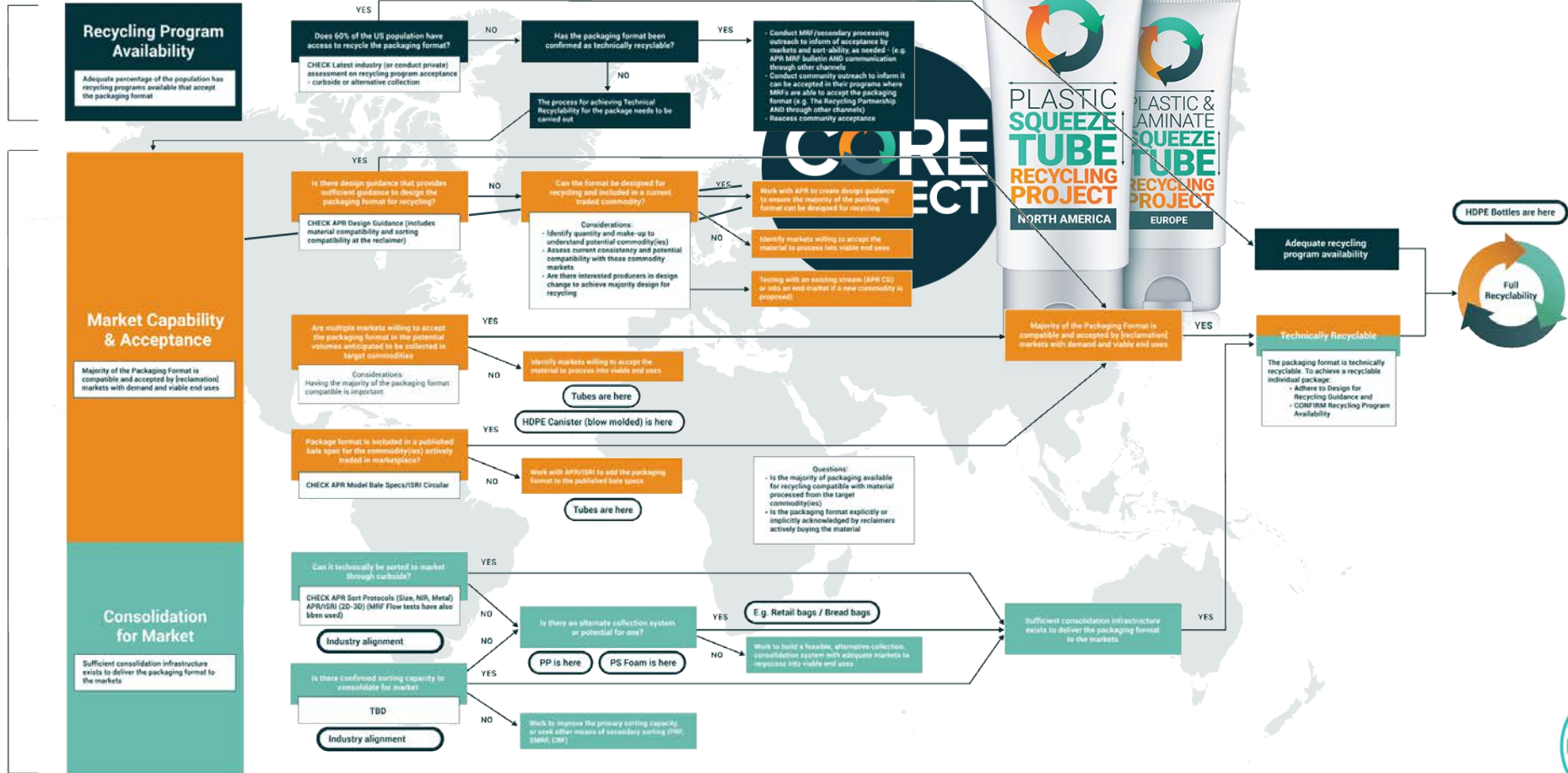
is the infrastructure in place to facilitate recycling of the packaging format?

Market Capability & Acceptance

Majority of the Packaging Format is compatible and accepted by [reclamation] markets with demand and viable end uses

Consolidation for Market

Sufficient consolidation infrastructure exists to deliver the packaging format to the markets





- **Policy** – Local, State, Federal, Global (e.g., EPR with eco-modulation, min content, bottle bills, carbon policy, regulate toxins)
- **Innovation** – Track supply chains, carbon, env impact to consider externalized env and health costs
- **Mobilize and Incentivize Citizens**— Actions for Circularity
 - **Buy less and local whenever possible**
 - **Support better science for better policy and navigate tradeoffs**
 - **Consider:**
 - GHG, Water consumption & Energy use
 - Toxicity of plastics and alternatives
 - Performance
 - Supply of base feedstocks and security of resources for future generations
 - **Incentivize reuse and encourage companies to design for reuse and durability**
 - **Pick up litter**
 - **Recycle right**
 - **Buy recycled and designed for recovery**



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The potential for innovation through inspiration from nature is as great as the risk we face by ignoring nature's signals. We must unlock that innovation.

We need to find a way to get back into balance.

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