Shifting Our Fate with Plastics
From a Linear to Circular Economy

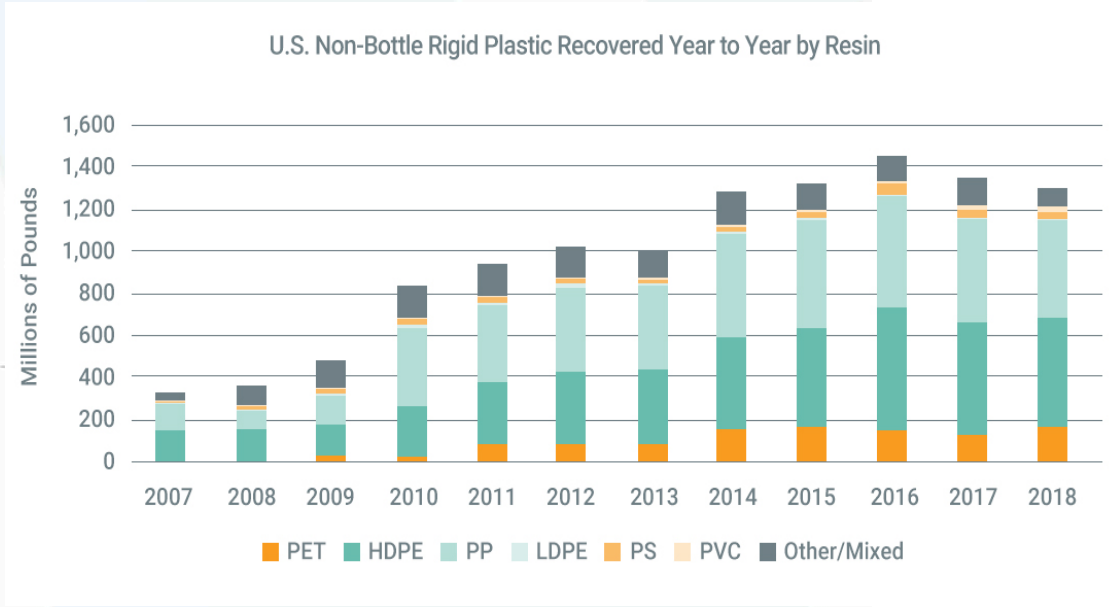
WI COR 2021

Tonya Randell

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

MORE RECYCLING

2020 ANNUAL NORTH AMERICAN PLASTIC RECYCLING STUDY



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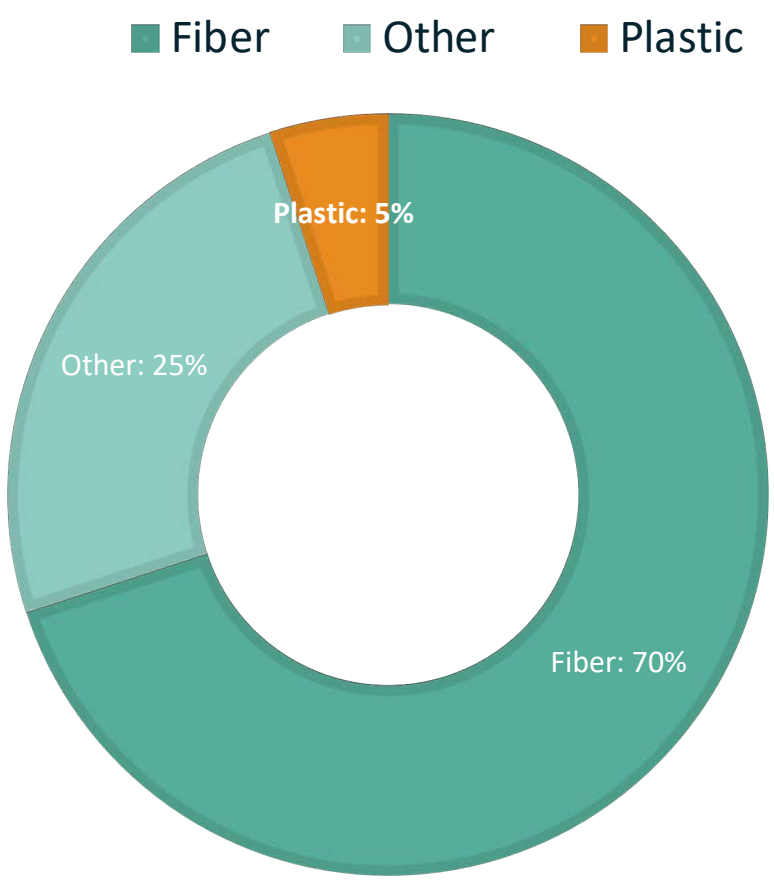
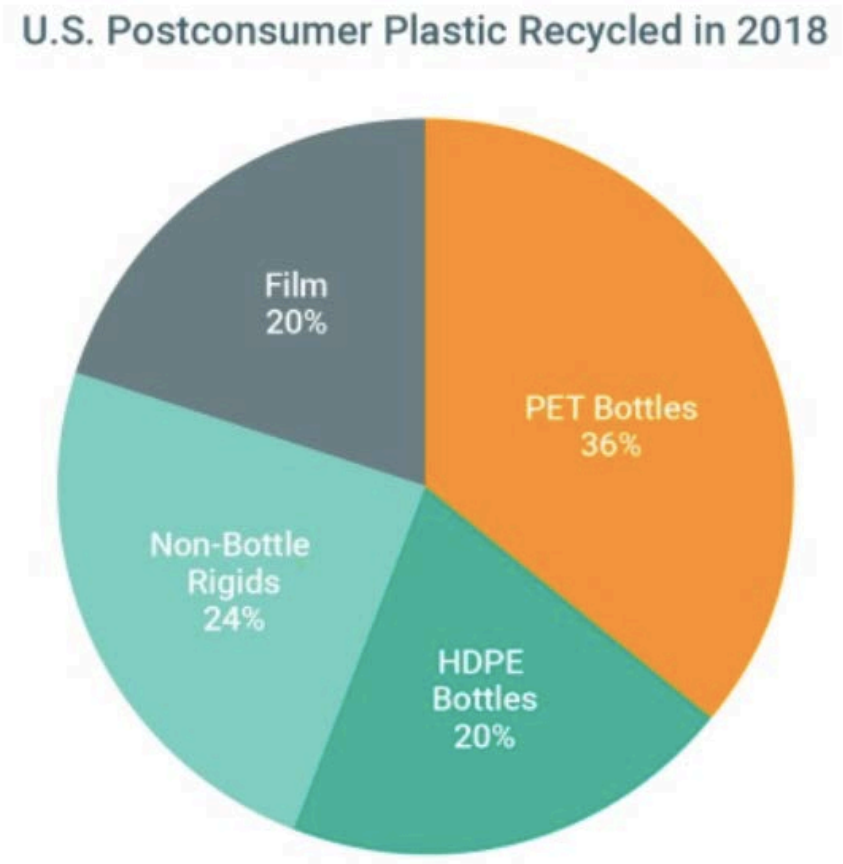
Background: Plastic Mix in the MRF Recycling Stream



Material Collected at MRF



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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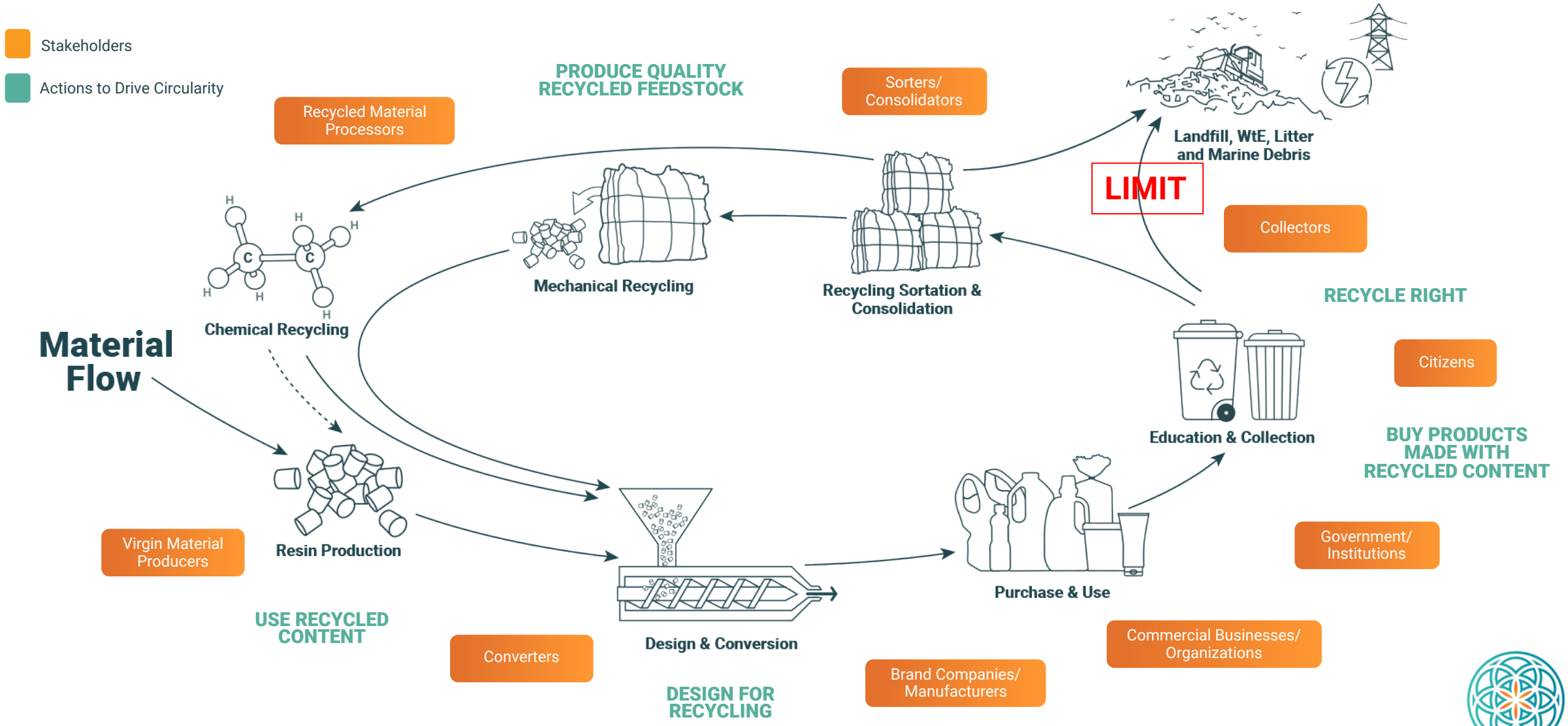
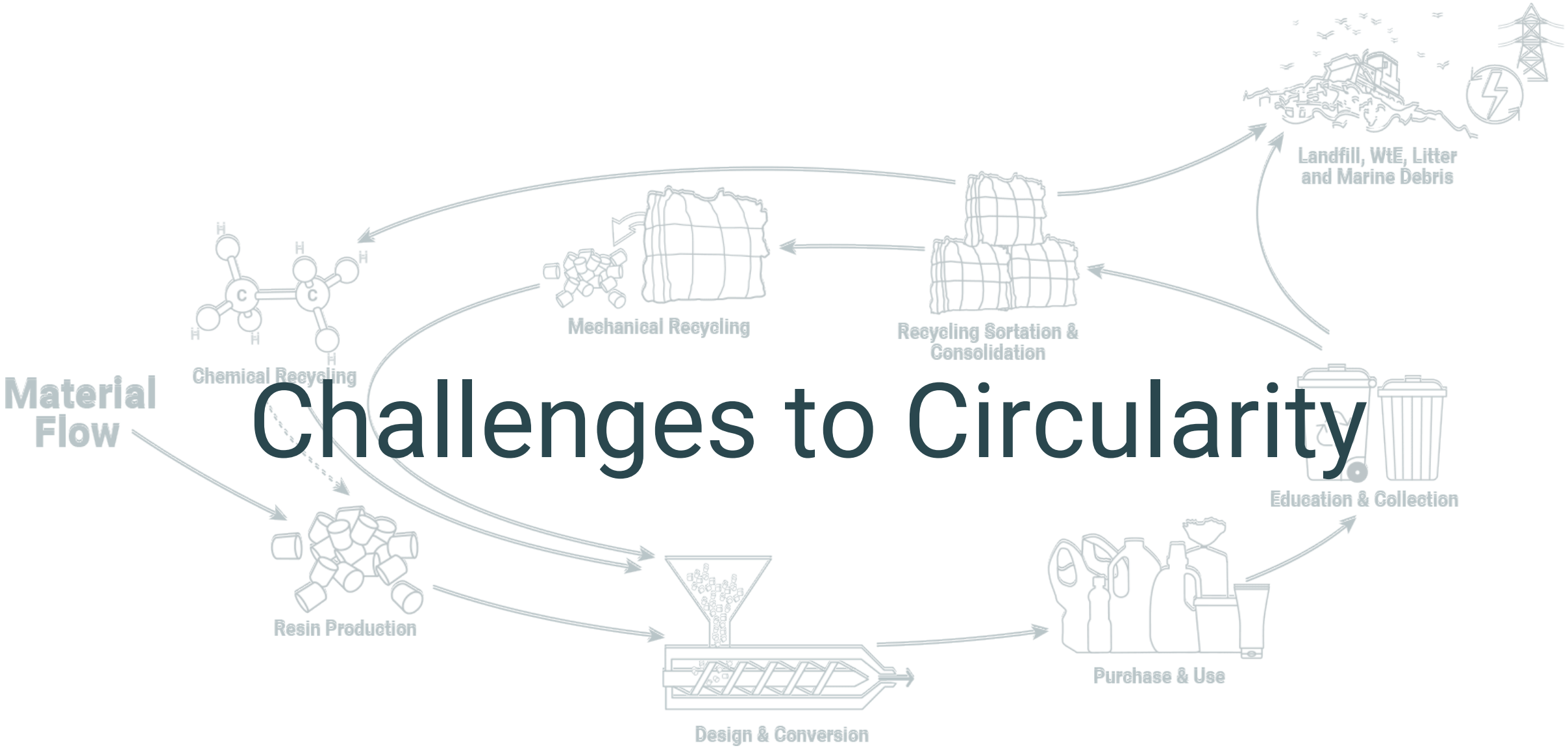
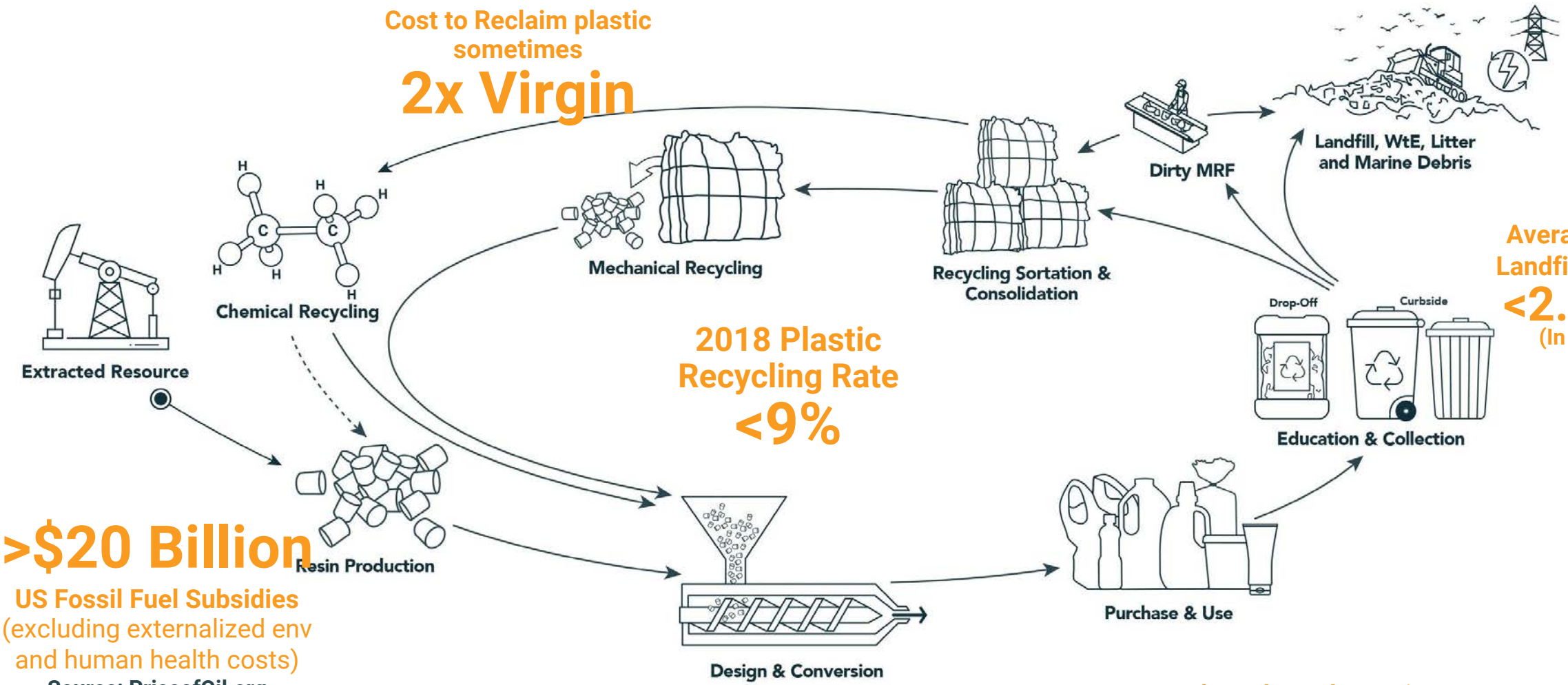
Successful Recycling is a Part of Circularity



Challenges to Circularity



Barriers Throughout the Value Chain for Plastic Circularity



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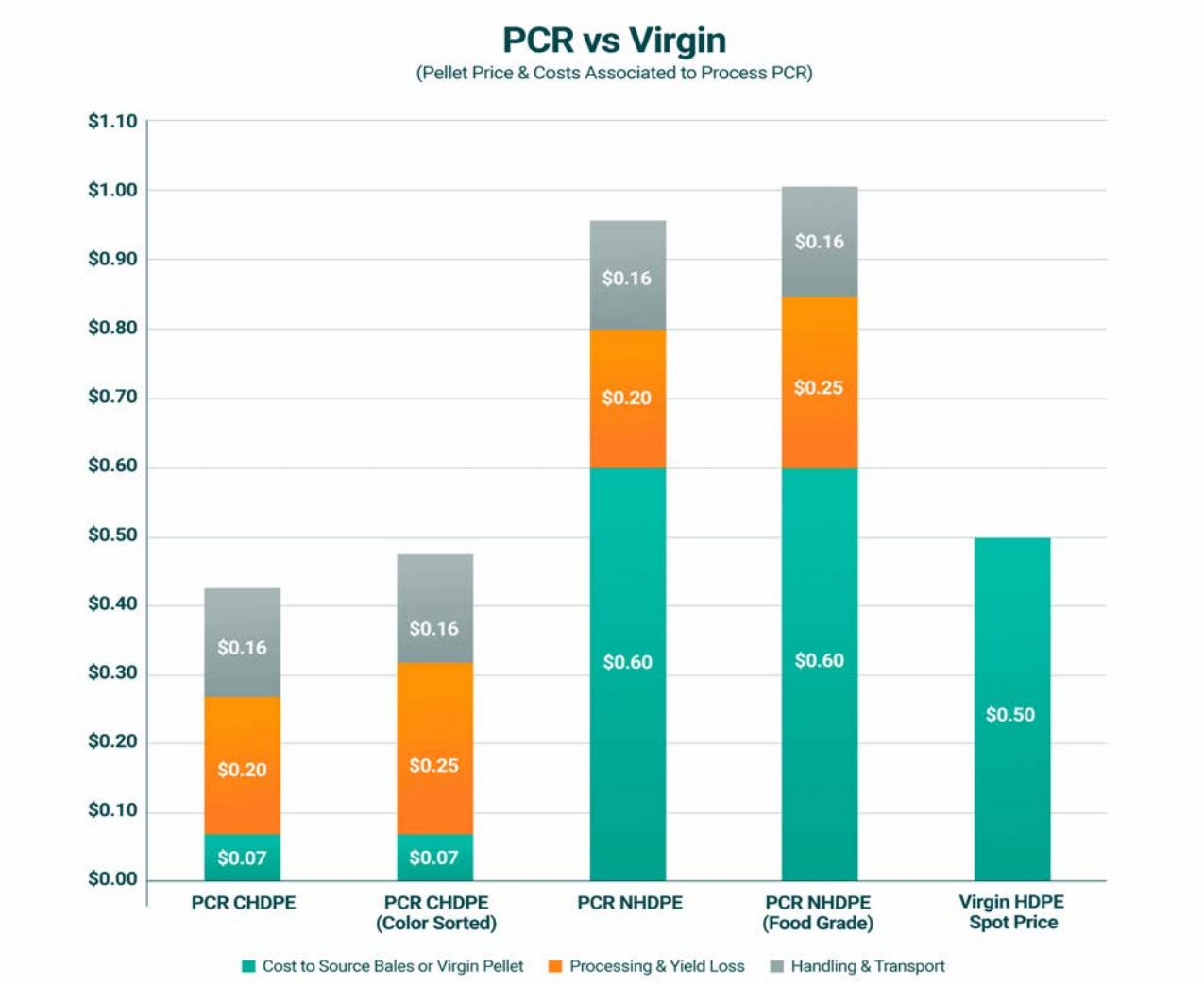
Recycled Plastic Is More Expensive than Virgin Plastic/Resin



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

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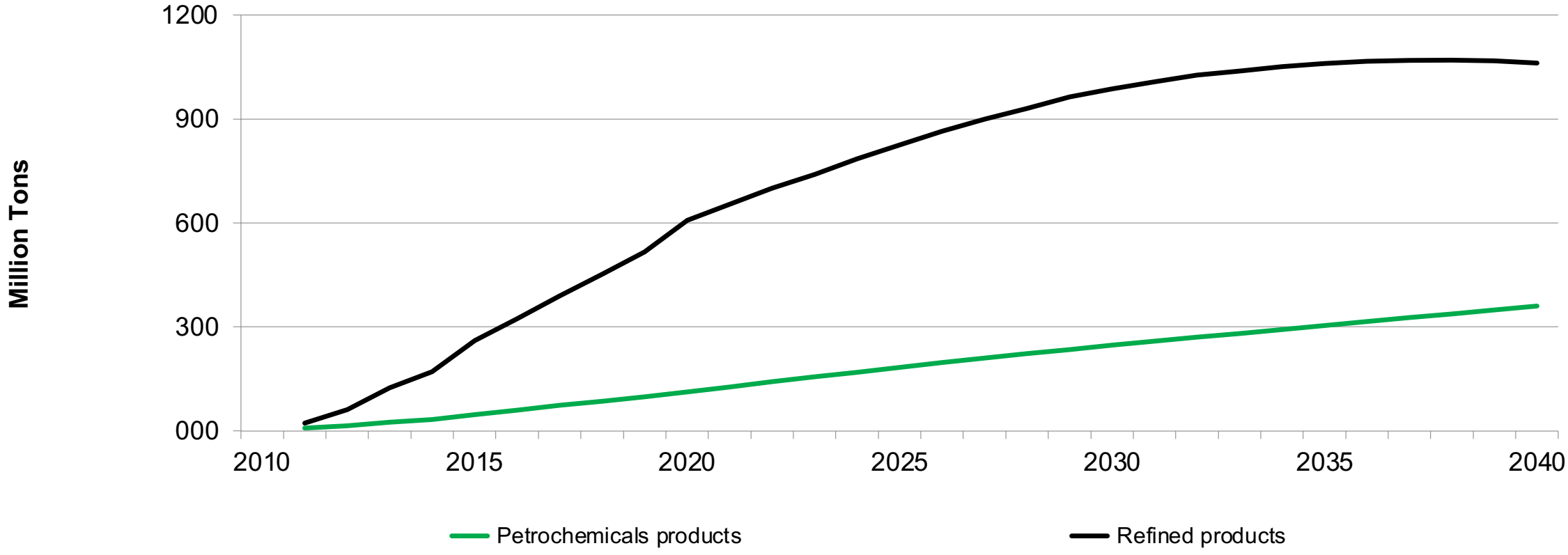
Predicted Future Growth in Plastic Relative to Oil and Gas

Petrochemicals and refined products markets, cumulative



Source: IHS Markit

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

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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

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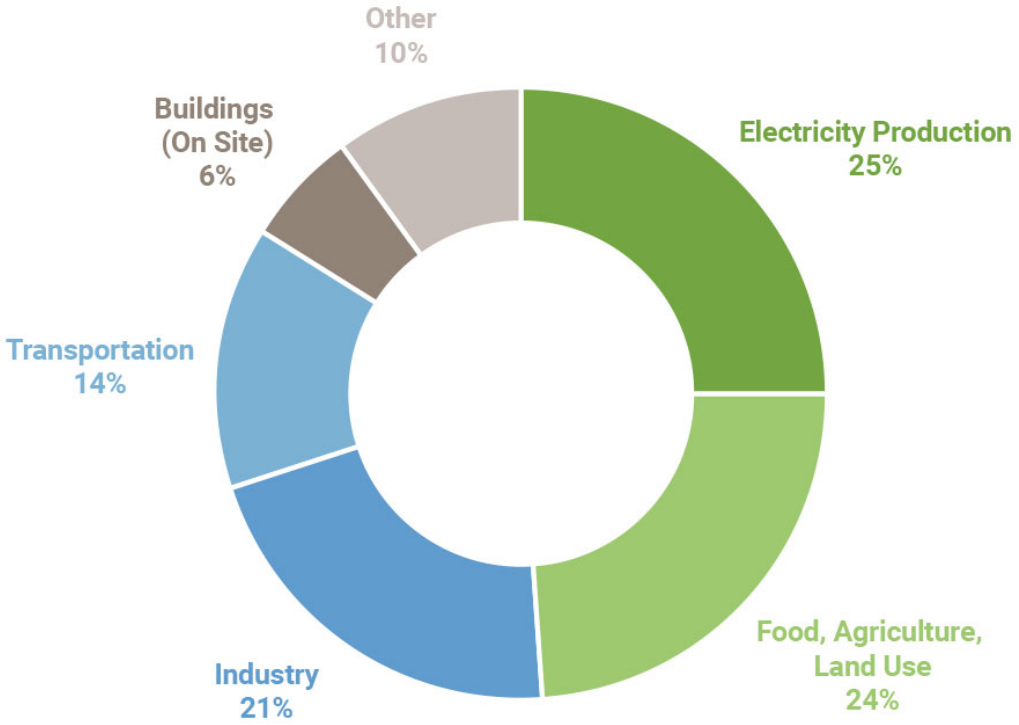
Can we decrease GHG emissions AND curb plastic waste?

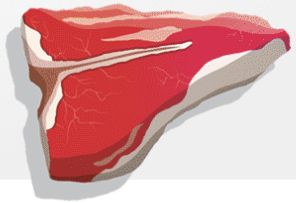
Greenhouse Gas Sources



Source: IPCC WG3

Examples of Plastic Packaging Innovation

Beef Packaging



ORIGINAL
Polysterene 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?

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Essential to Transition from a Linear to a Circular Economy

Linear System

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

Info Exchange

RTI INTERNATIONAL

Municipal Solid Waste DECISION SUPPORT TOOL

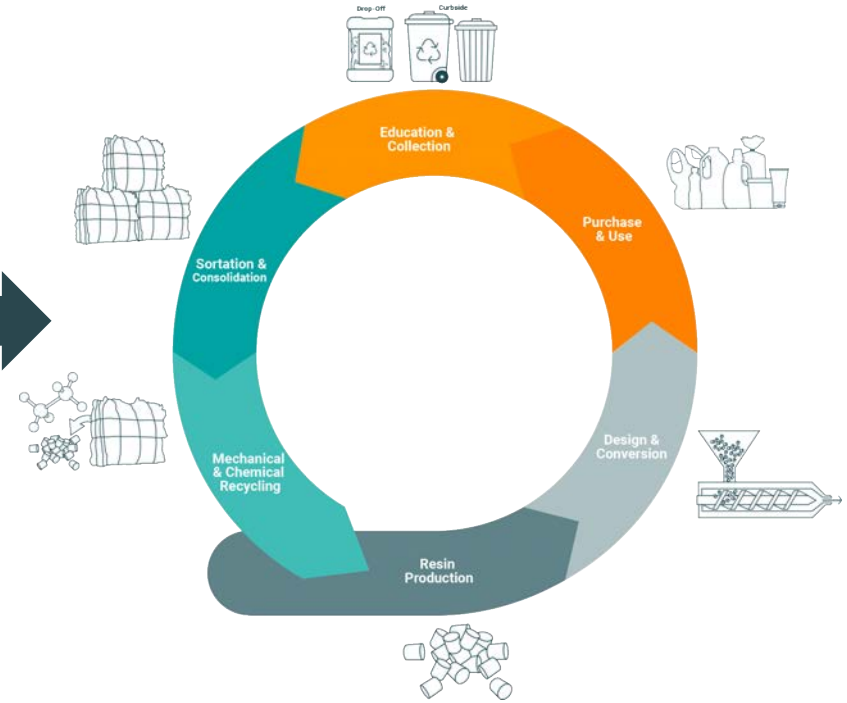
BUY RECYCLED PRODUCTS DIRECTORY

CIRCULARITY IN ACTION

plasticsmarkets.org

ELEMENTS OF RECYCLABILITY

Circular System



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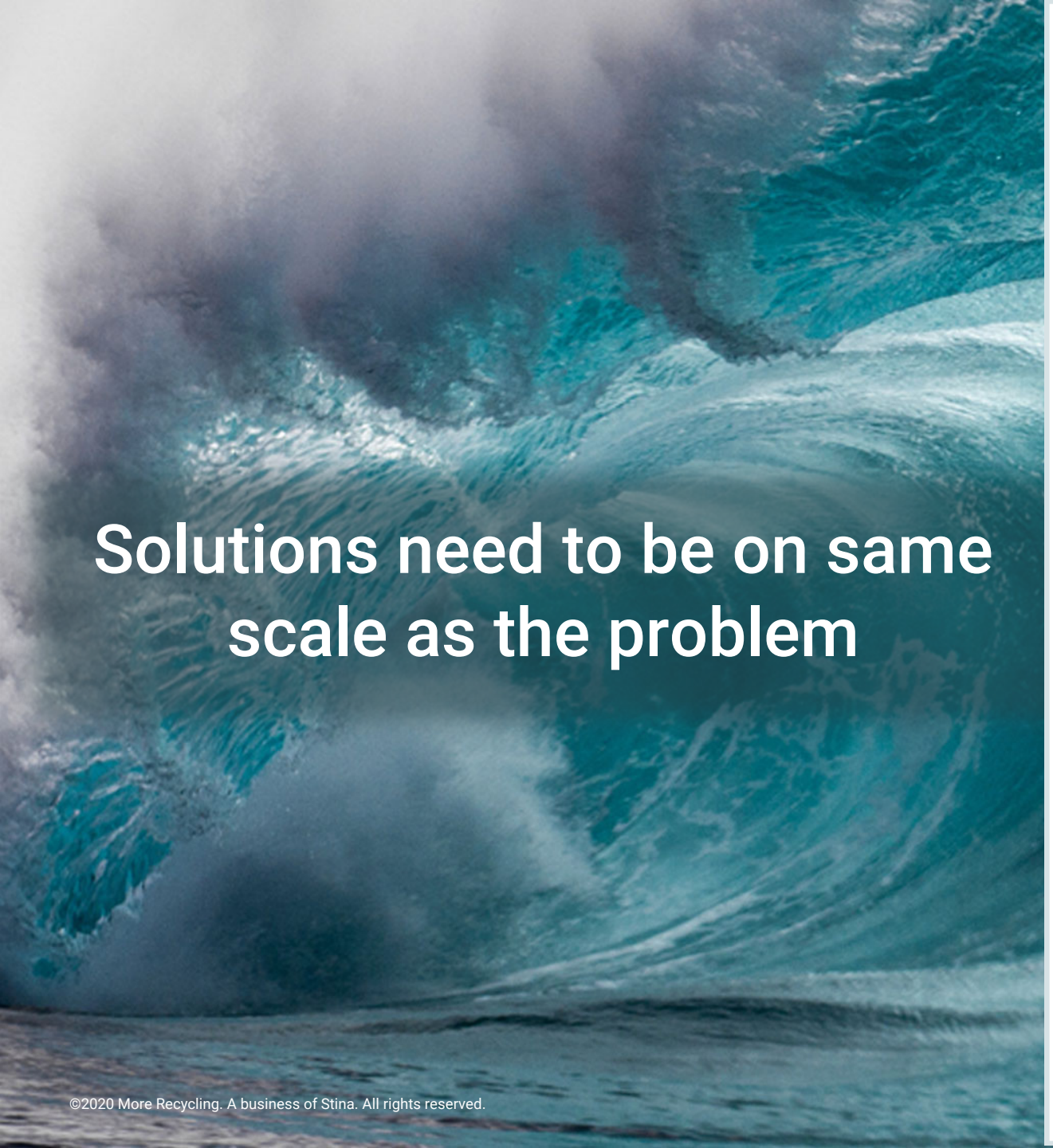
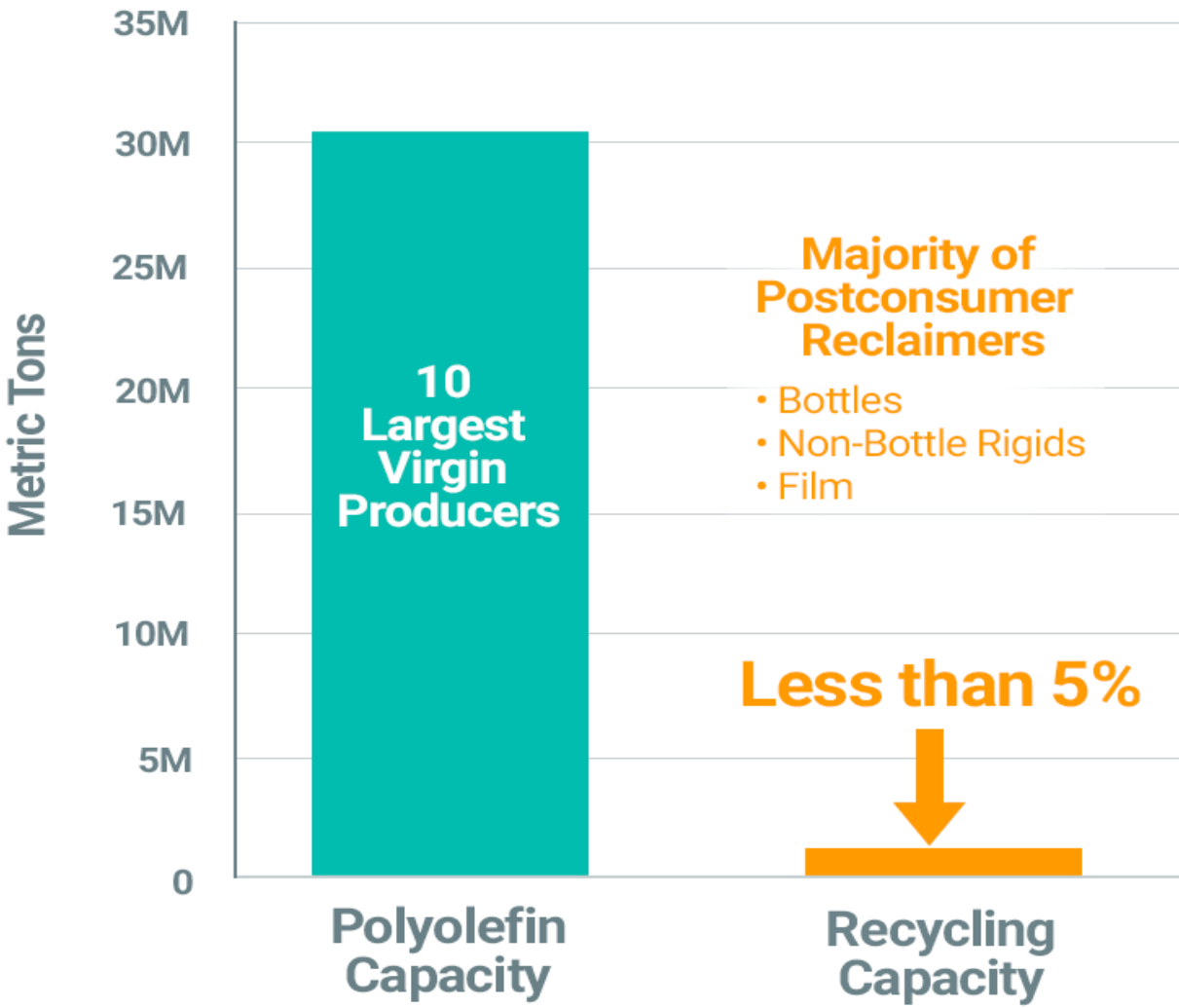


U.S. Polyolefin Capacity

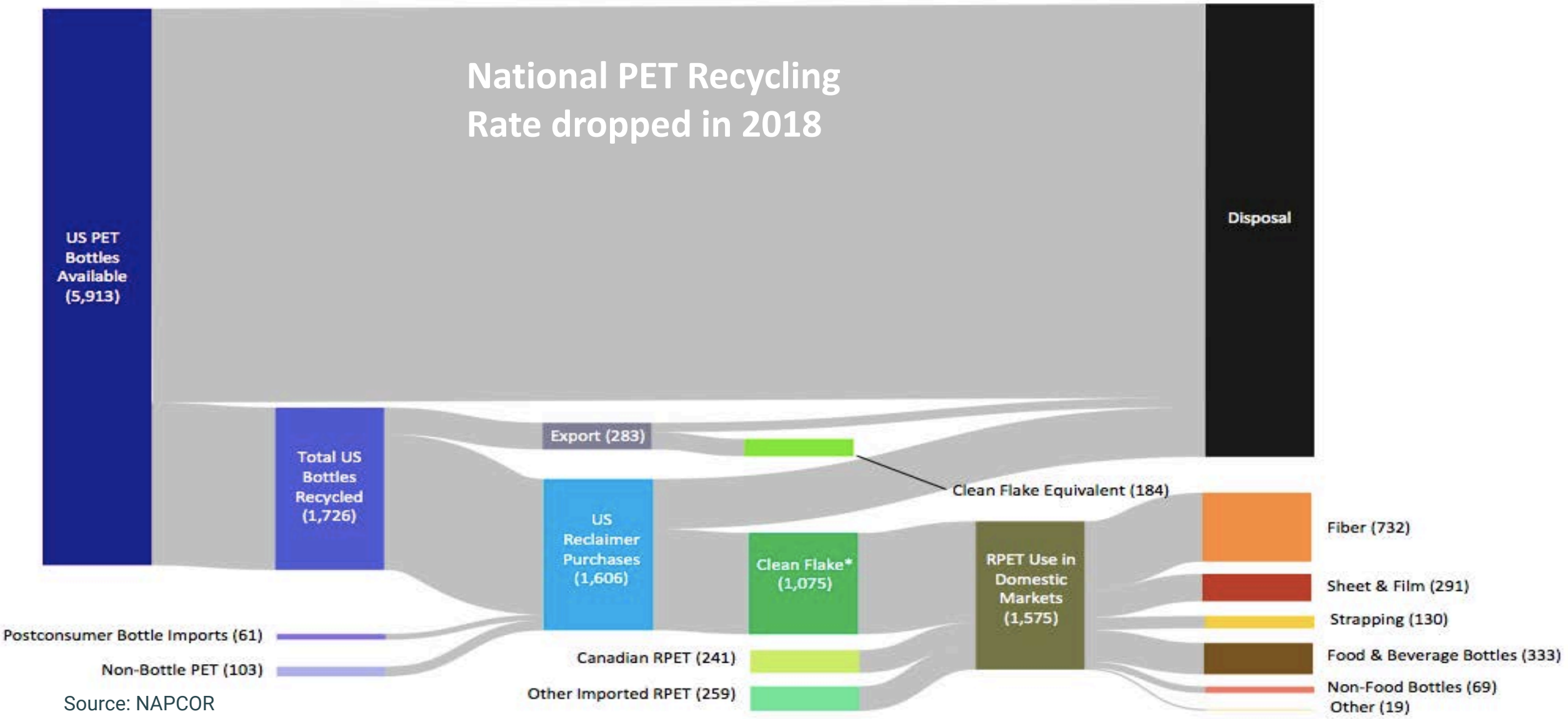


Source: IHS Markit and More Recycling

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

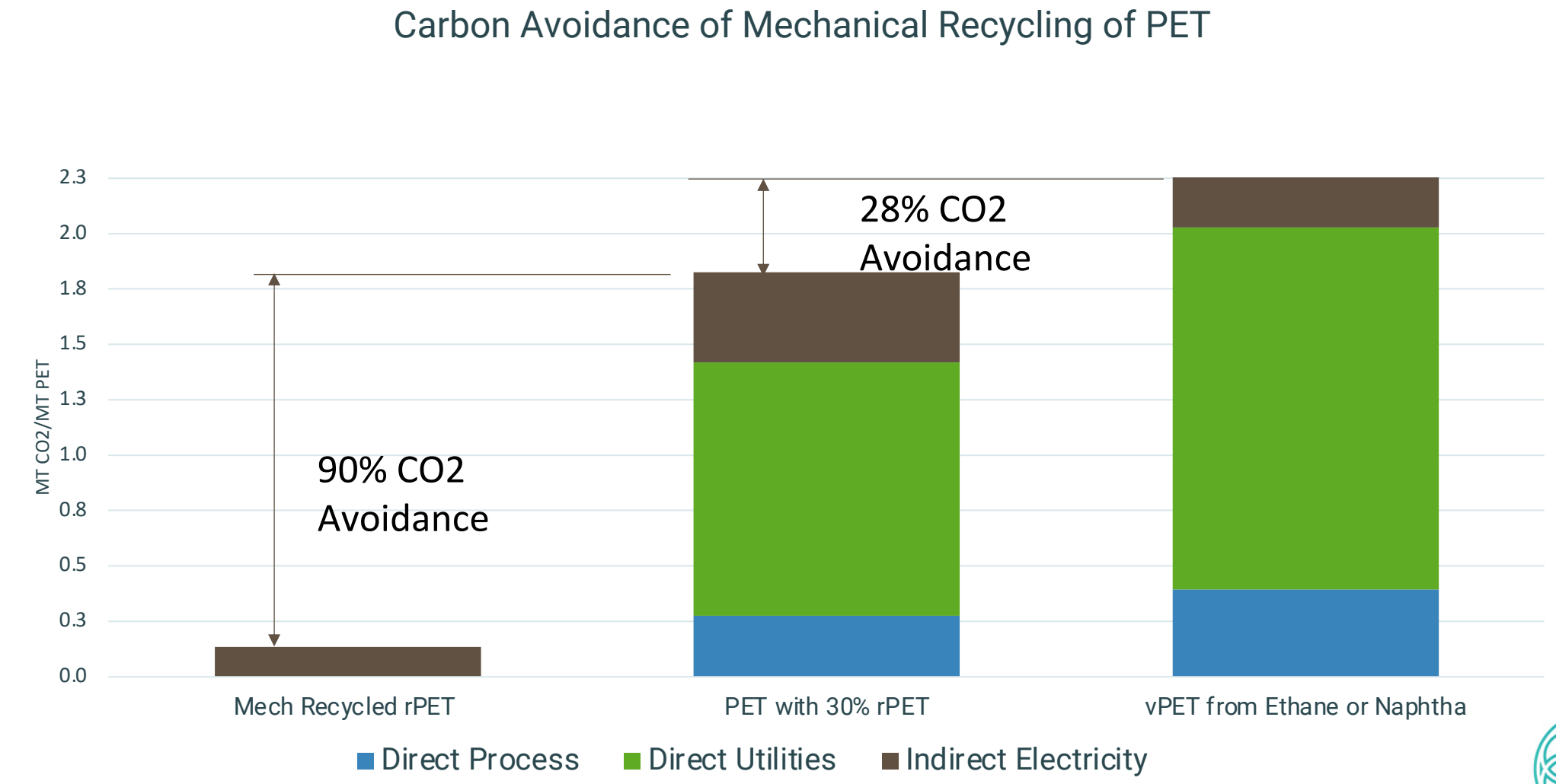
Where to Start? Consider PET Recycling

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



Source: NAPCOR

Recycling is Critical to Climate Action



Source: IHSMarkit

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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

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Better Policy. Greater Innovation. More Action.

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Clearinghouse of Tools to Support Efforts Around the Value Chain

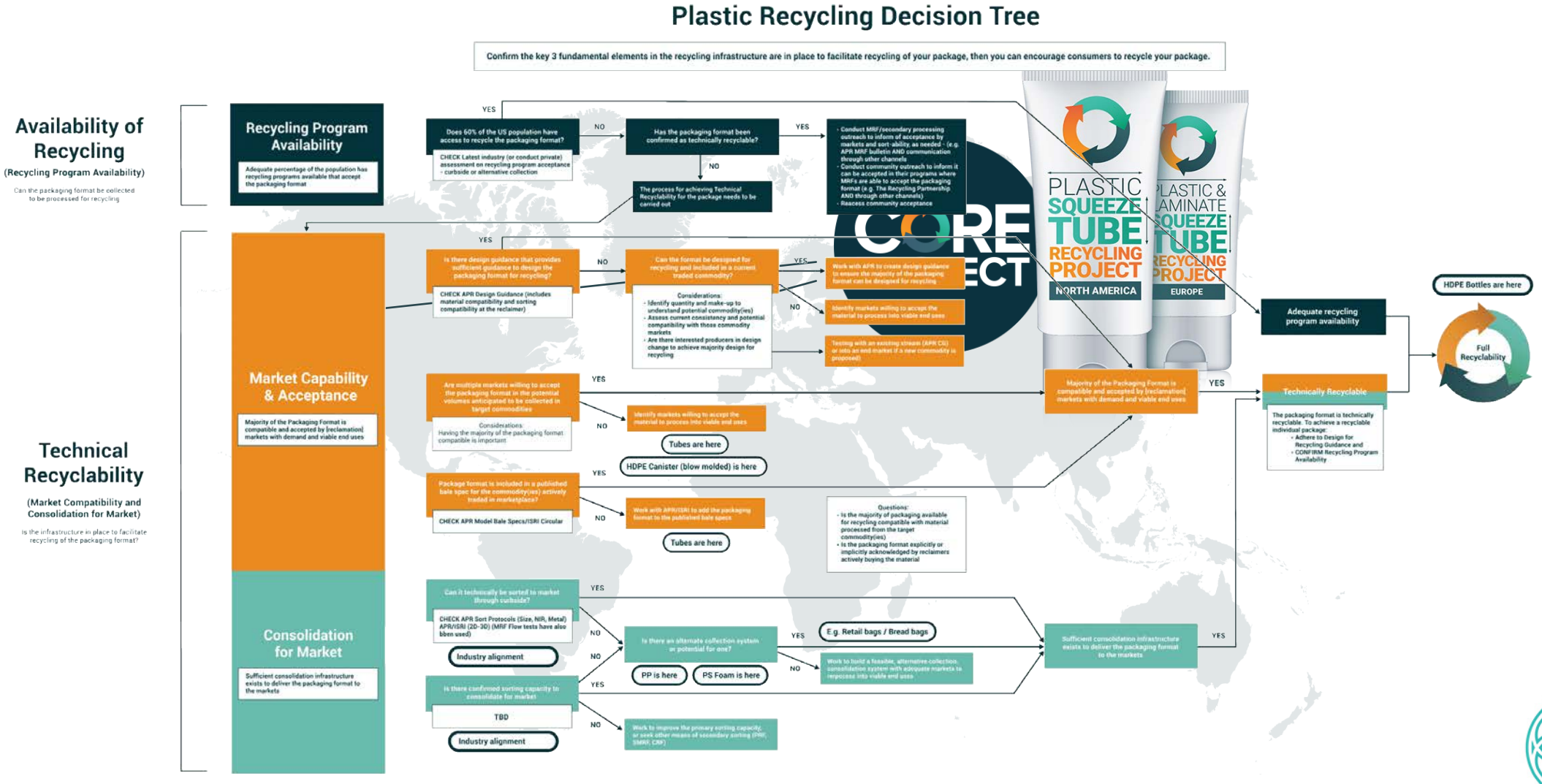
Washington Plastic Study - Recommendations to Solve Plastics Issues

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

Collaboration across the value chain



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Conclusion: We need Local & Global Solutions for Circularity

- **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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