The Role of Recycling in Addressing the Plastics Crisis

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Alliance For Mission-Based Recycling
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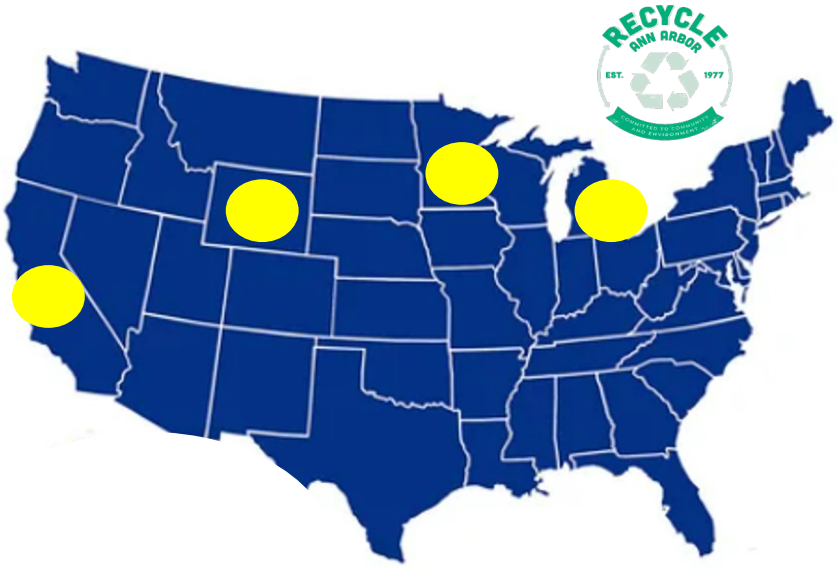
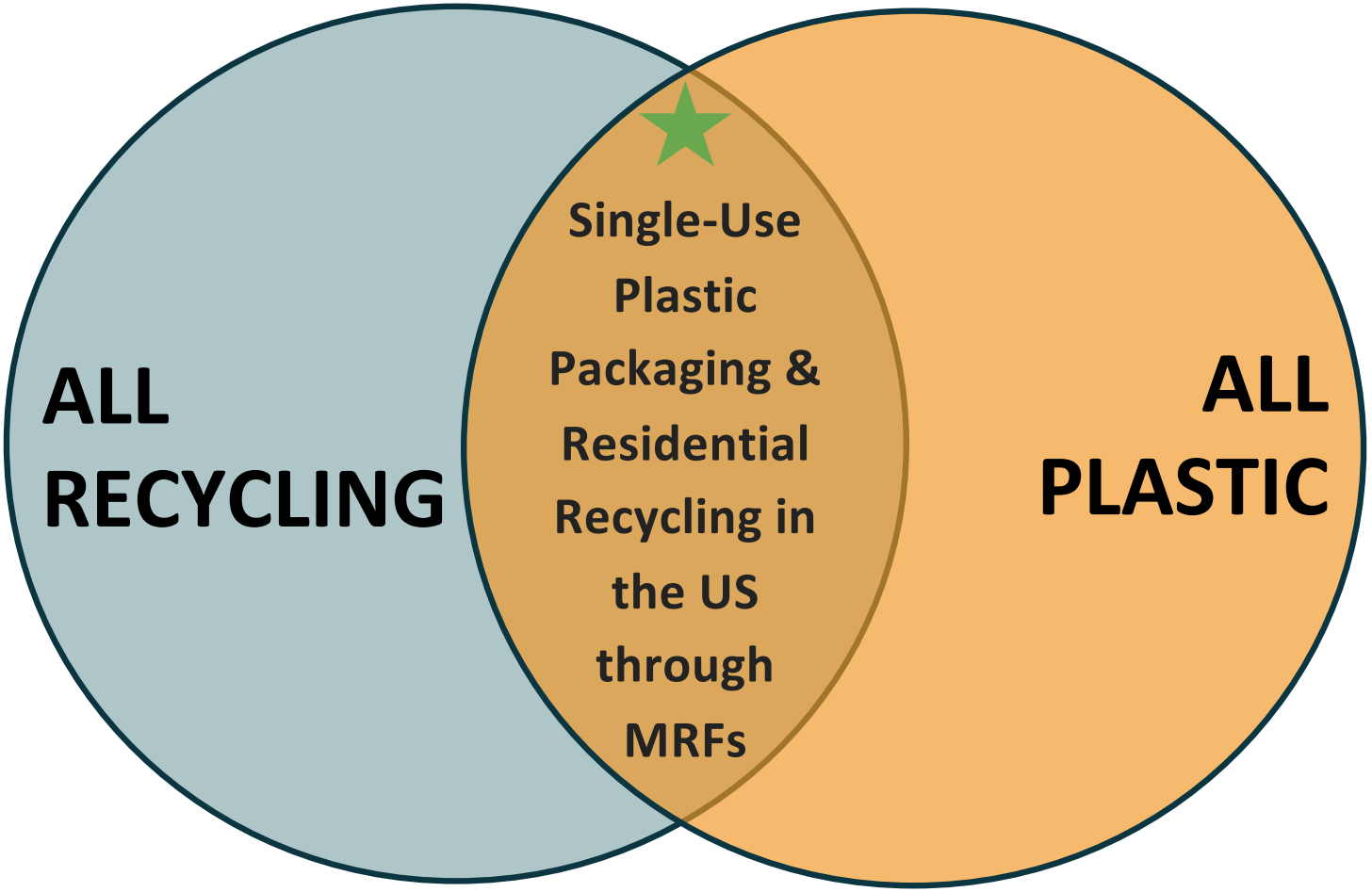
Alliance of Mission-Based Recyclers

AMBR is a coalition founded original pioneers of mission-driven, community-based nonprofit recycling in the U.S.
Together we are guiding new recycling policies and infrastructure investments to rebuild credible, transparent recycling systems that serve as a bridge toward a circular economy and just, resilient local communities.



Today's Conversation



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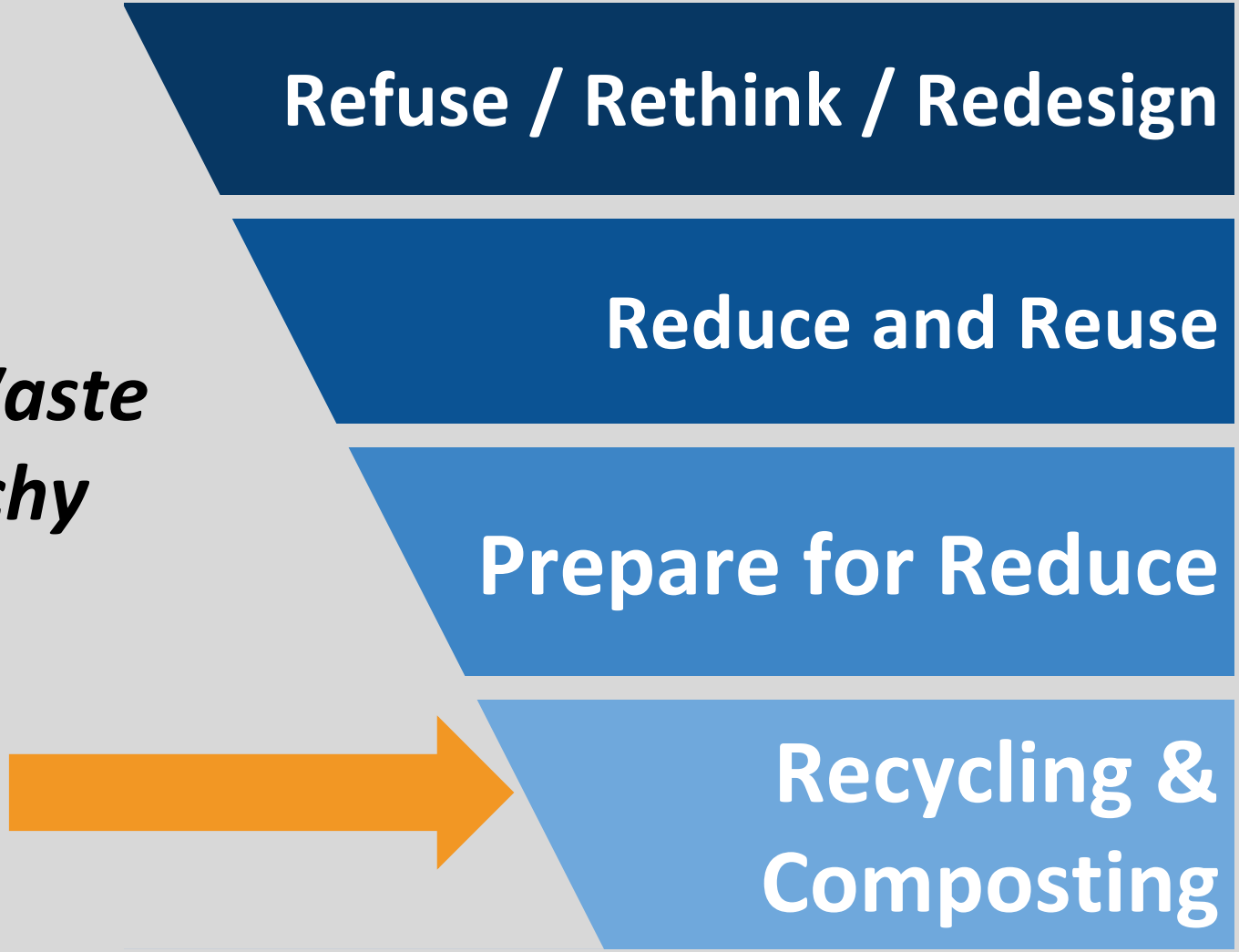
Zero Waste Hierarchy



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Material Recovery Facilities (MRFs)

- About **350 MRFs** in the US ranging in sizes, equipment, technology
- **65+%** are single-stream
- **245 tons/day** on avg
- Sort and prepare recyclables for supply chain
- Sort by size, weight, shape with people & technology

Manufacturing Feedstock (NOT Managing Waste)

Products of the MRF: Commodity Bales

MOST MRFs Manufacture:

- Cardboard
- Mixed paper
- Aluminum cans
- Steel cans
- Glass
- PET packaging (#1)
- HDPE bottles – natural (#2)
- HDPE bottles – colored (#2)

SOME MRFs:

- Polypropylene tub & lids (#5)
- Mixed rigid plastics (#3-#7)
- Cartons and Aseptic Packaging

What Comes into the MRF? (by weight)

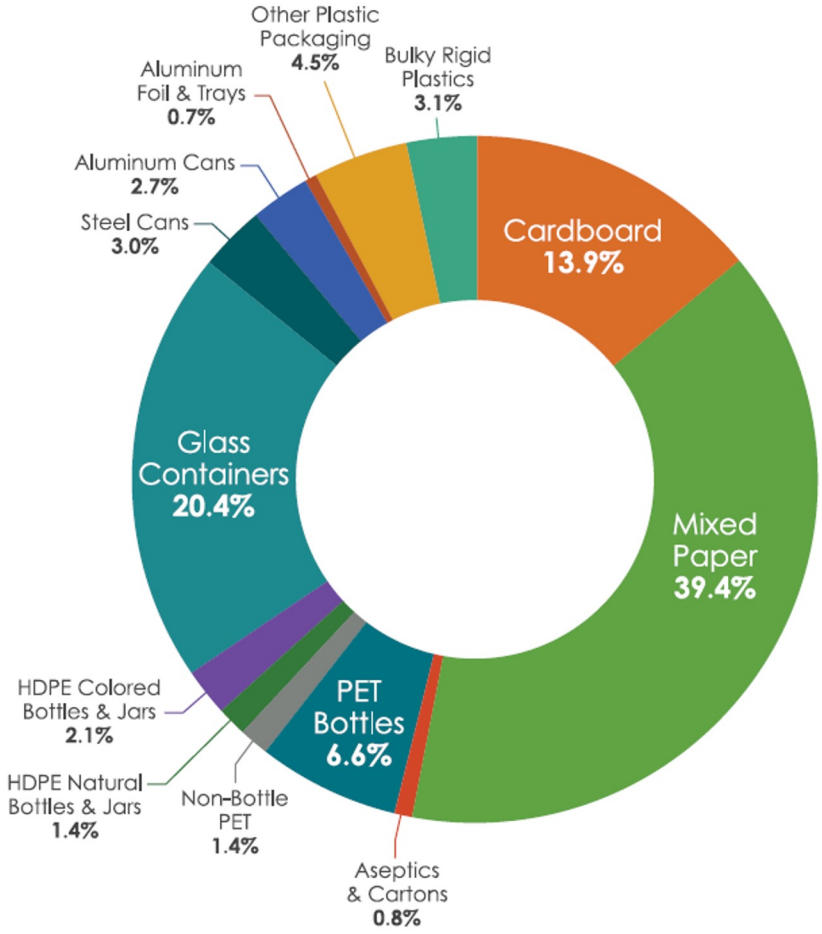
50+% Paper

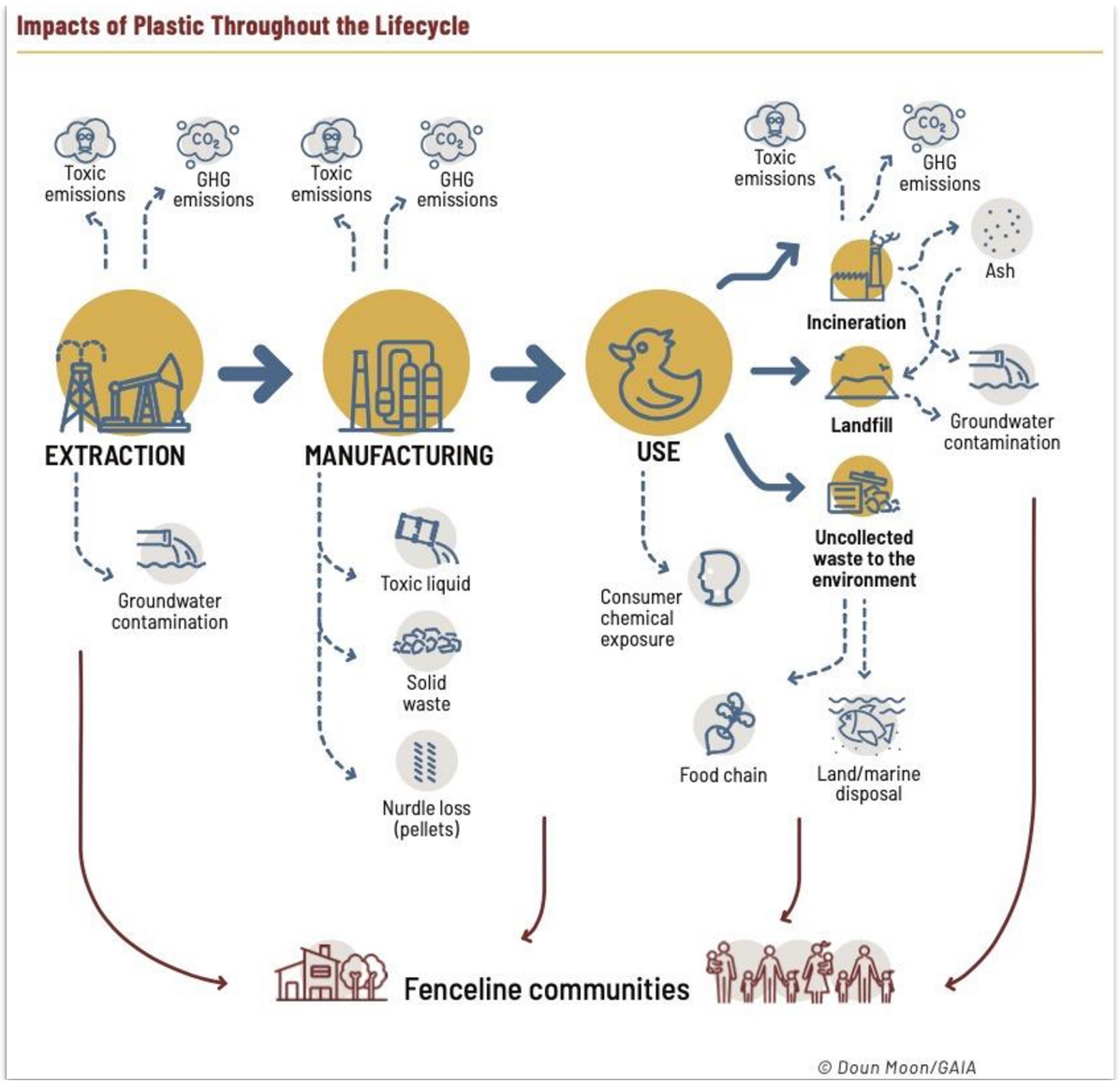
20% Glass

6% Alu and Steel Cans and Foil

11.5% Plastic Bottles

** Average single family tons (Source: The Recycling Partnership)*




Impacts of Plastic Throughout the Lifecycle
Toxic emissions
GHG emissions
Toxic emissions
GHG emissions
Toxic emissions
GHG emissions
Ash
Incineration
Landfill
Groundwater contamination
EXTRACTION
MANUFACTURING
USE
Uncollected waste to the environment
Groundwater contamination
Toxic liquid
Solid waste
Nurdle loss (pellets)
Consumer chemical exposure
Food chain
Land/marine disposal
Fenceline communities
© Doun Moon/GAIA

So What About Plastic *Recycling*?

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PENNSYLVANIA

20% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #23 -5

RECYCLING RANK 2018 #18

POPULATION
13,012,059

CENSUS SUB REGION
MIDDLE ATLANTIC

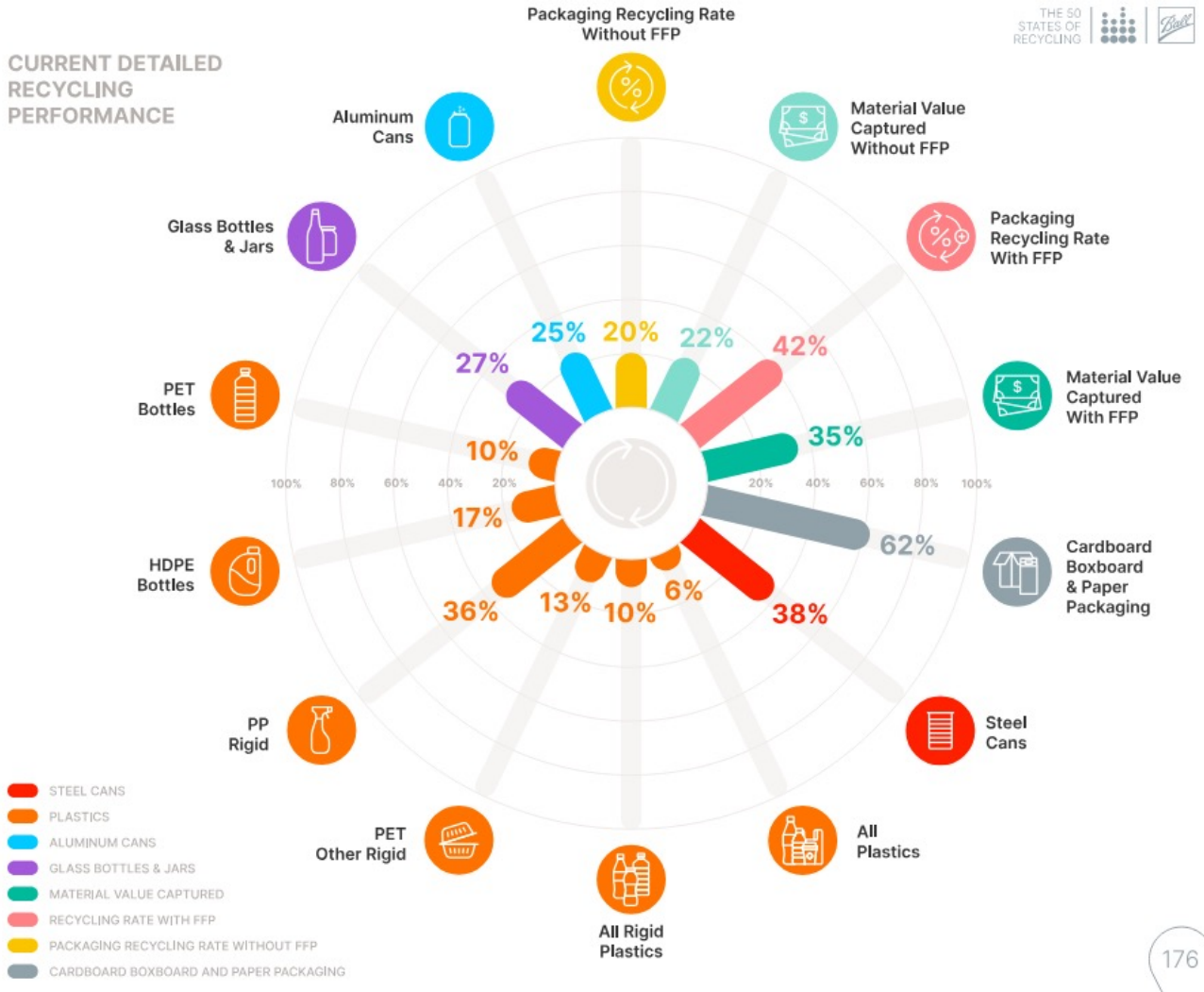
RECYCLING REFUND STATE
NO

DATA QUALITY

GOOD FAIR LIMITED

OVERVIEW

Municipalities and counties in Pennsylvania report annual tons recycled (for both the residential and commercial sectors) to the Pennsylvania Department of Environmental Protection (DEP). Currently, 94% of the state has access to recycling services via curbside or drop-off, while 79% of the population has curbside access. Pennsylvania Act 101 mandates that all municipalities develop a solid waste management plan.



https://www.ball.com/getattachment/na/Vision/Sustainability/Real-Circularity/50-States-of-Recycling-Eunomia-Report-Final-Published-March-30-2021-UPDATED-v2.pdf.aspx?lang=en-US&ext=.pdf

PENNSYLVANIA

CURRENT STATE OF RECYCLING

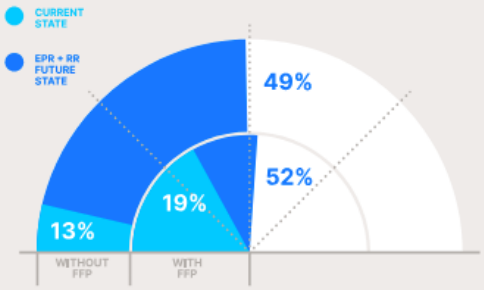
- In 2021, Pennsylvania recycled approximately 20% of packaging materials without FFP. This recycling performance increases to 42% when considering materials with FFP.
- The value of the material captured for recycling was $140 million, just 35% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 3.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 7,000 to 17,900.
- Place $330 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 4.5 million MTCO2e annually.

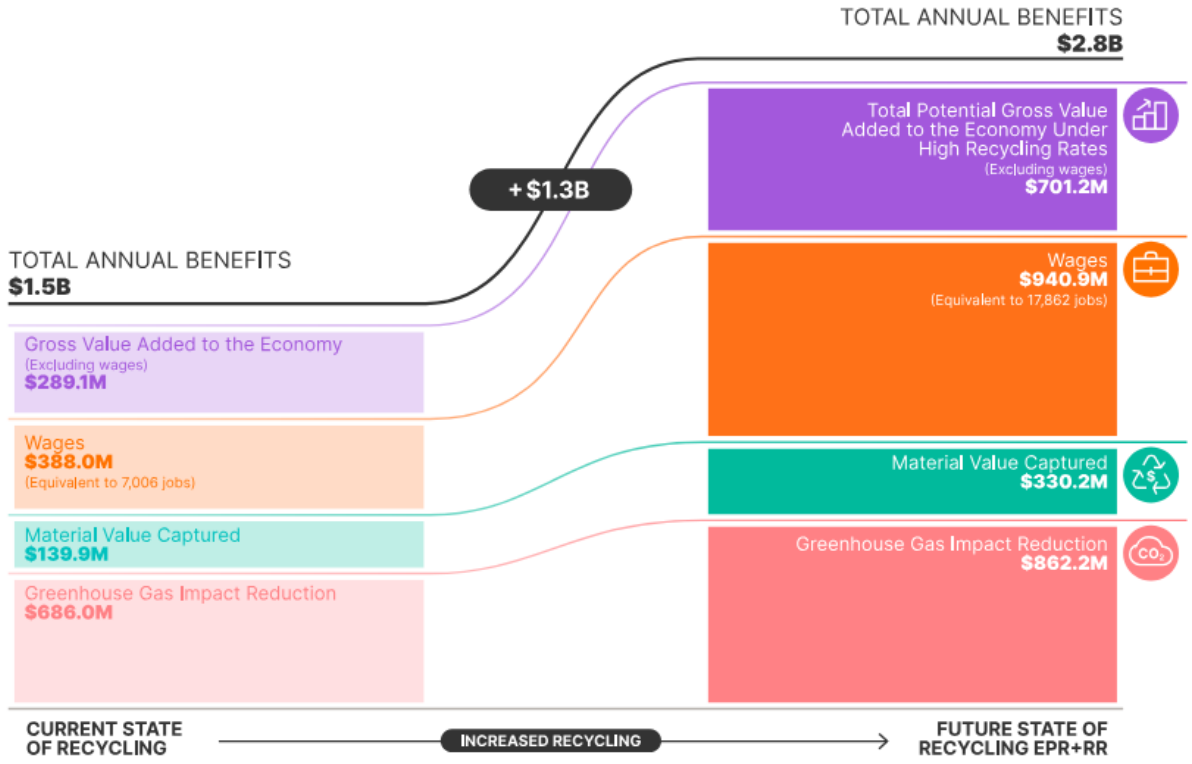
CLOSED-LOOP IMPACTS



THE 50 STATES OF RECYCLING

THE ECONOMIC AND ENVIRONMENTAL OUTCOMES OF WELL-DESIGNED EXTENDED PRODUCER RESPONSIBILITY (EPR) + RECYCLING REFUND (RR) PROGRAMS

EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



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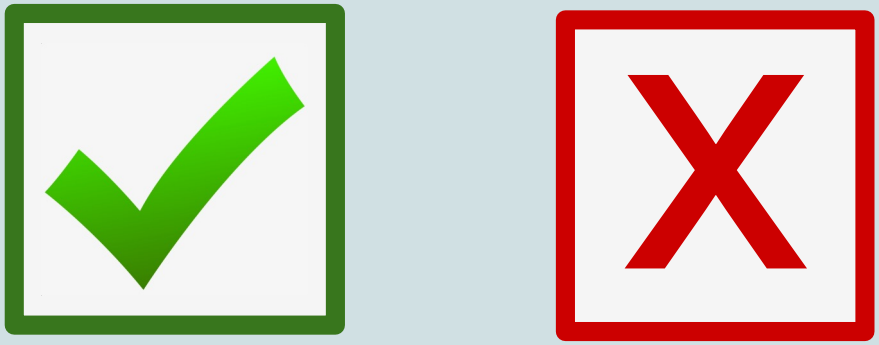
Plastic Recycling: Yes or No?



It Depends!

The Real Question:

Under *what conditions* should we advocate for **more & improved** plastic recycling?

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Compared to What?

If we aren't recycling, we're doing one of these:

Reduce

Reuse

Redesign

Compost

Landfill

Incineration

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False Solutions

BURNING PLASTIC, INCINERATION

CHEMICAL "RECYCLING", *ADVANCED "RECYCLING", PYROLYSIS

Toxic air pollution = dioxins, mercury, lead, particulates, etc

Most incinerators are in Environmental Justice communities.

Climate pollution

Ash ⇒ Landfills


Sorting it All Out
CAN we recycle it?
And SHOULD we recycle it?
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What Makes Something "Recyclable" in a MRF? *Can we?*

End Markets	Multiple, dependable, transparent buyers making new products from the material type. Geography matters - but not always the indicator.
Value	Sale of materials > costs to collect and sort materials and transport. Geography matters.
Sortability	Size, weight, shape, composition, quantity of packaging, market prevalence. Technology matters.
Collection	Curbside programs and incentives to participate. Critical volume and fits in a cart.

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Even if it <u>can</u> be recycled, ***SHOULD we?***

Extraction Reduction?

Env Impacts

Reduction / Reuse Potential

Labor

Toxicity

Environmental Justice

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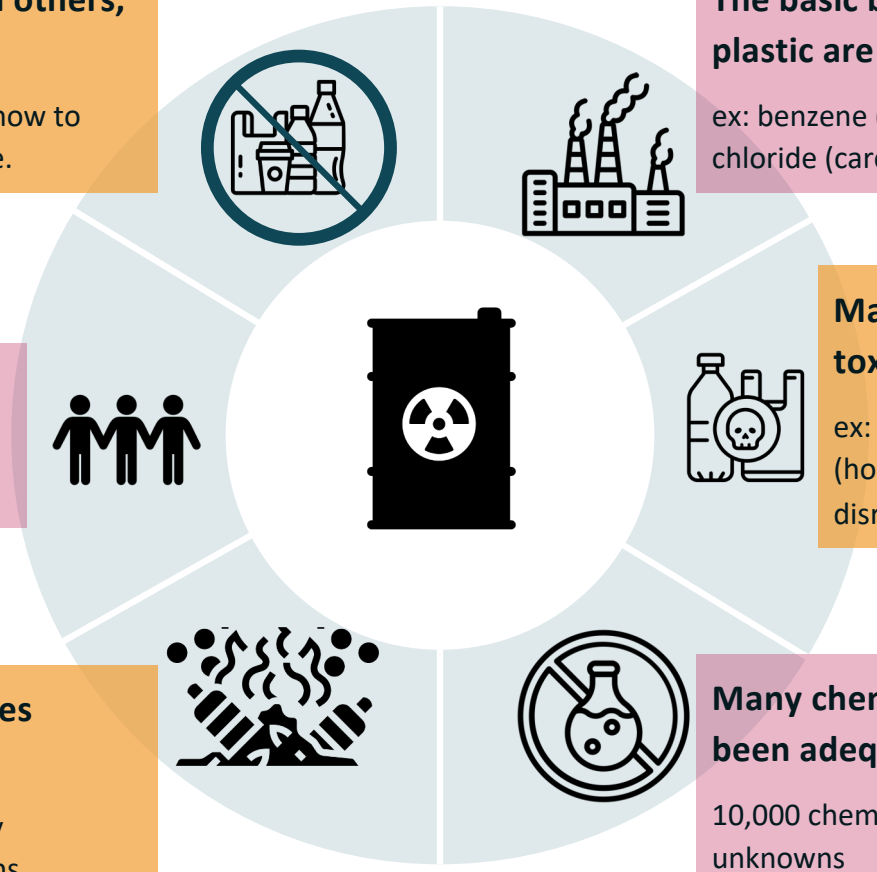
Toxics in Plastic Production & Lifecycle

Some plastics are more toxic than others, but all plastics are toxic.

PVC and polystyrene are the two worst, how to order the rest is a matter of some debate.

The basic building blocks of fossil-fuel based plastic are toxic.

ex: benzene (carcinogen), styrene (carcinogen), vinyl chloride (carcinogen), BPA (hormone disruptor)



Many additives used in plastic are toxic.

ex: phthalates (reproductive effects), UV 328 (hormone disruptor), nonylphenol (hormone disruptor)

Who is impacted?

Communities near extraction, production, & disposal + workers + consumers.

When plastic is burned, this creates different toxic compounds.

ex: PVC incineration generates extremely carcinogenic compounds known as dioxins.

Many chemicals used in plastic have not been adequately tested for safety.

10,000 chemicals used in plastic production, many unknowns

Slide courtesy of Safer States

Toxics and Recycled Plastic

Toxic chemicals can persist through the recycling process. We need to get toxics out of products to begin with!

The recycling process itself can also introduce chemicals into recycled plastic. Imperfect sorting, external contamination, inadequate washing.

Toxic chemical bans in a circular economy don't work as well. In a circular economy, the harmful chemical will just keep recirculating.

Food contact recycled plastic is of particular concern due to exposure potential. There are some federal guidelines, but very weak.

The toxics issue can't be ignored. There are serious health effects associated with virgin plastics - could recycled plastics be even worse? Recycling will only be successful in the long run if there is trust in material quality.

Slide courtesy of Safer States

Can we? / Should we?

1 PETE

2 HDPE

4 LDPE

6 PS

Black Plastic

03 PVC

5 PP

7 OTHER

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PET Bottles (#1 water & soda)

YES

Can We Recycle It?

- **Markets:** Many. There are limited markets for bottle to bottle but many for other uses.
- **Value:** Relatively strong but volatile
- **Sortability:** Mostly easy - lightweighting is a factor
- **Collectability:** 57% (with bottle bill), need to add non carbonated beverages

Should We Recycle It?

- **Circularity:** Best chance of any, but only 30% bottle to bottle in US
- **Bottle Bill:** Drastically increases recovery, but success relies on informal, unprotected labor that needs further protection
- **Redesign:** Sprite green to clear.
- **Toxicity:** Chemicals of concern need to be designed out

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PET Thermoforms (clamshells)

PETE

YES

Can We Recycle It?

- **Markets:** Most PET bottle markets take up to 10% thermoforms. New thermoform only markets emerging.
- **Value:** Relatively Low
- **Sortability:** Costly to isolate if not in bottles
- **Collection**: Low volume

Should We Recycle It?

- **Circularity:** On their own, more opportunity to go back into clamshells
- **Toxicity:** Chemicals of concern need to be designed out

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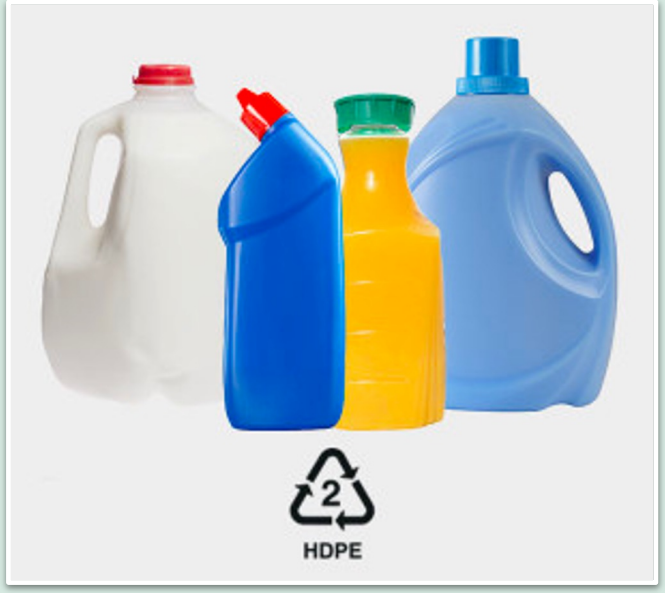
HDPE Natural (Milk) & Color (Laundry)

YES



Can We Recycle It?

- **End Markets:** Many
- **Value:** Relatively strong but volatile (Natural is more stable)
- **Sortability:** Mostly easy
- **Collection**: Easy but insufficient

Should We Recycle It?

- **Toxicity:** Almost all recycled HDPE pellets tested by IPEN contained toxic flame retardants, BPA, UV stabilizers
- **Circularity:** Some commitment from brands for higher post-consumer content. Colorant makes circularity impossible without purification

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Polypropylene (yogurt tubs & lids)

Maybe

Can We Recycle It?

- **End Markets:** Strong but few, geographically concentrated
- **Value:** Relatively strong but volatile
- **Sortability:** Easy with technology ($)
- **Collection**: Low recovery rate

Should We Recycle It?

- **Circularity:** Limited end markets, concentrated on eastern half of country, hard to get back into food grade packaging
- **Cost:** Only possible with funding from Industry and State
- **Toxicity**: Endocrine disrupting chemicals have been found to leach from PP food containers.

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Plastic Bags

NO

Can We Recycle It?

- **End Markets:** Some (lumber)
- **Value:** Pretty low
- **Sortability:** Disaster in MRFs, puts other materials at risk - Huge safety risk
- **Collection**: Need drop off
- **Cost -** astronomically high

Should We Recycle It?

- **Toxicity:** Toxicity ends up in new products
- **Circularity**: Doesn't demand reduce extraction
- Bags are a good candidate for reduction through bag ordinances and bans.

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Plastic Bags: one of the big problems with film in MRFs

Polystyrene

NO

Can We Recycle It?

- **End Markets:** One or two
- **Value:** Very low
- **Sortability:** Disaster in MRFs
- **Collection**: Contaminates other material

Should We Recycle It?

- **Toxicity**
  - Polystyrene is one of the most toxic plastics
  - Made from cancer-causing styrene
- **Circularity**: No

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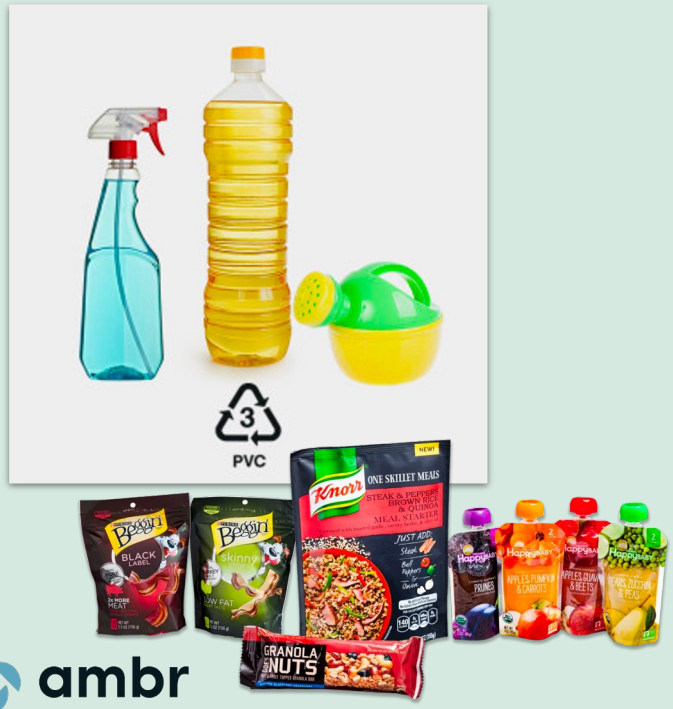
The Rest...

NO



Can We Recycle It?

- **End Markets:** None
- **Value:** None
- **Sortability:** Maybe containers, not labels in MRF
- **Collection:** Not much of it but a huge problem

Should We Recycle It?

- **Toxicity** - Some of the most toxic plastics.
- **Circularity**- Does not reduce extraction.

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Key Take-Aways

1

Recycling is not a viable or effective solution for the majority of single-use plastic packaging.

Any recycling advocacy should always include or be complemented by strong reduction and non-toxic reuse strategies.

2 **A few formats of single-use plastics packaging are candidates for recycling in a MRF-based residential recycling system in the U.S. as we work to move away from plastic:**

- PET #1 Bottles
- PET #1 Thermoform
- HDPE #2 Bottles (Natural and Color)
- Possibly #5 Polypropylene containers (depending on your region in the U.S.)

3

Any push for increased plastic packaging recycling must include:

- ❑ Pushing for improved worker protection for both the formal and informal sector
- ❑ Transparency and responsibility for human and environmental protections in “end markets” (buyers of sorted recyclables), and
- ❑ Elimination of toxic additives in all plastic packaging

3

Hold the line against ‘false solution’ recycling initiatives.

While there may be an industry push for investing in “recycling” solutions for these materials, these four categories are clear arenas where we can hold the line ***against*** plastic recycling initiatives and instead ***advocate only*** *for* reduction in production and consumption:

1. **Carry-home and produce plastic film & non-woven plastic bags**
2. **PVC (#3) single-use packaging**
3. **Polystyrene single-use packaging**
4. **Mixed material flex pouches**
5. **#7 plastics**

Questions?

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- www.nl2w.com
- https://www.ambr-recyclers.org/
- Watch AMBR's video "Chasing Arrows" about plastics and recycling
- Get an inside look at Eureka Recycling's MRF.