



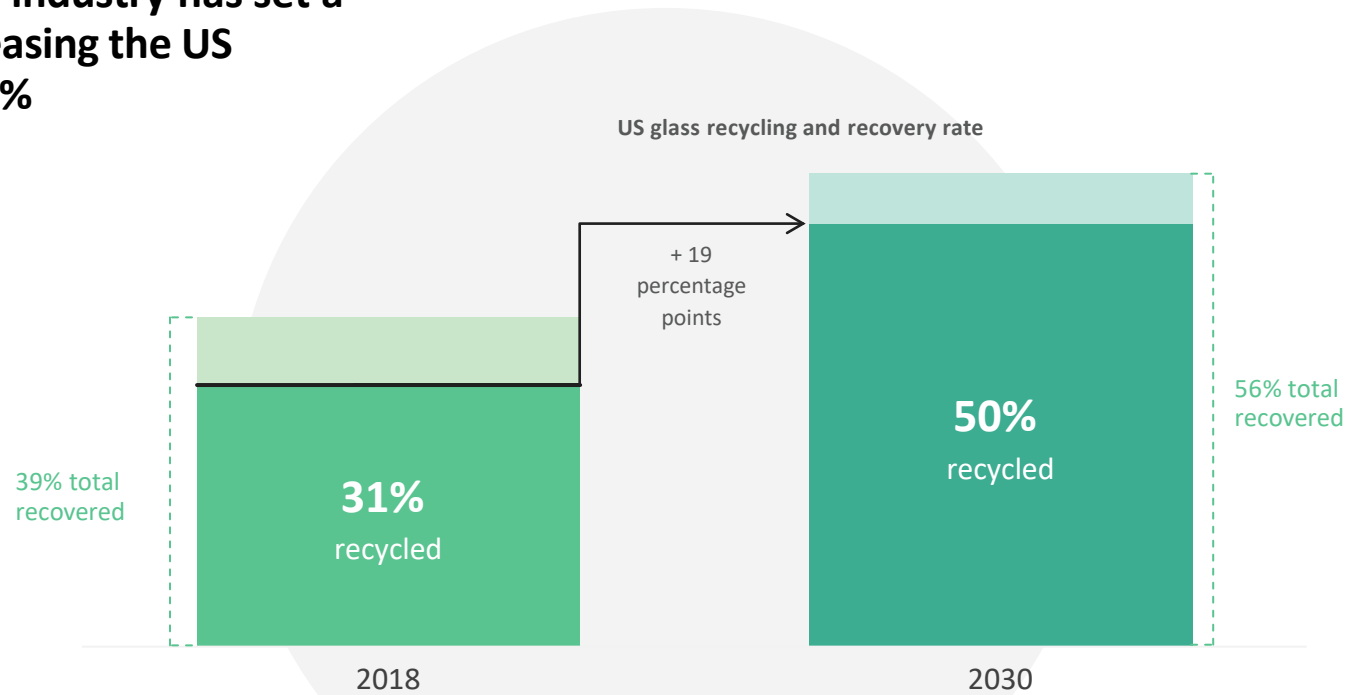
NRRA Recycling Conference 2022
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US Glass Road Map



The glass container industry has set a **bold target** of increasing the US recycling rate to 50%



Sources: United States Environmental Protection Agency; Glass Packaging Industry (GPI); BCG.

Note: The 39% figure represents the rate of glass recovered (or collected), but some recovered glass is lost to landfills or as it moves along the recycling value chain, from sorting to processing to manufacturing. The remaining 31% is recycled into new containers. Some variability exists in how recycling rates are calculated across the US.



Improved US glass container recycling is an important goal

Eliminates glass from landfills

Preserves natural resources

Extends furnace life

Reuses material infinitely

Reduces energy and manufacturing costs

Maintains quality forever



Reduces carbon emissions

Sources: GPI; BCG.

Recycled materials are much more environmentally friendly than virgin materials

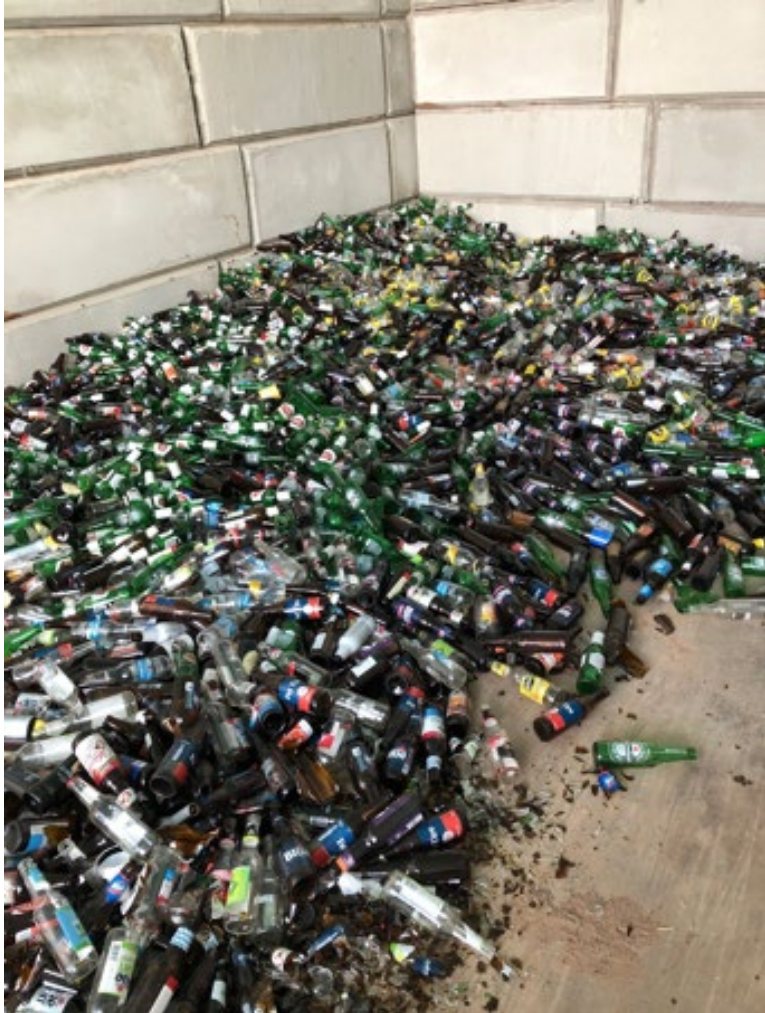


Achieving a **50% glass recycling rate** reduces greenhouse gas emissions by **~1.4M metric tons annually**



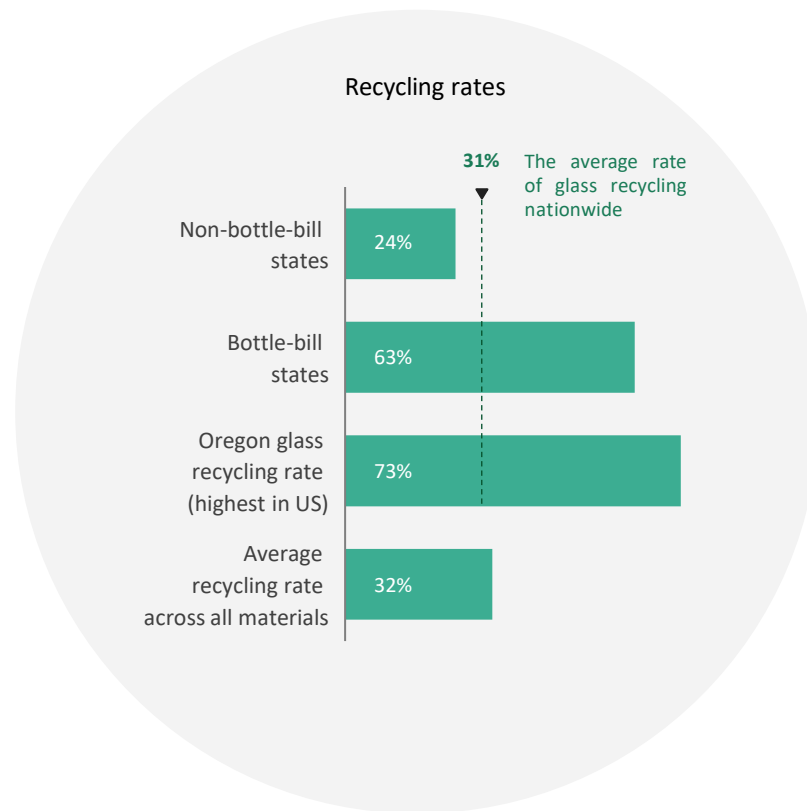
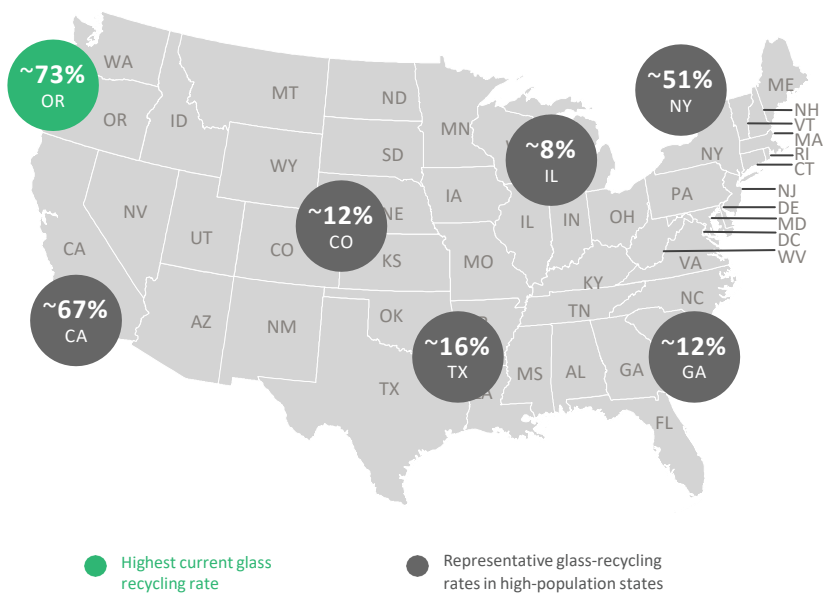
= The equivalent of taking **~300K cars off** the road each year

QUALITY MATTERS



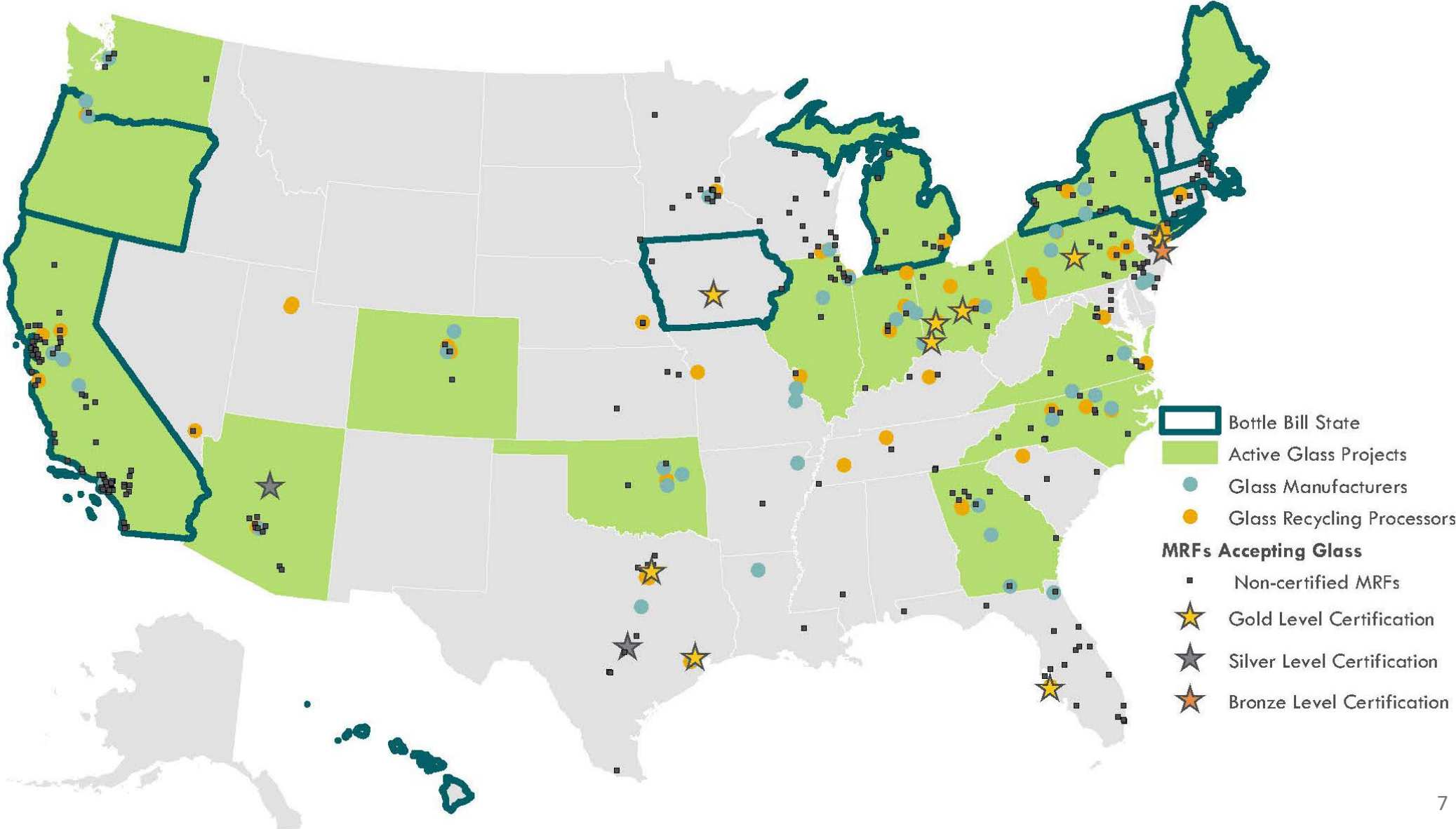
MRF Glass vs Bottle Bill Glass

The industry's goal is **ambitious** given the current status of glass recycling across the US



Sources: GPI; Container Recycling Institute; Resource Recycling; US Environmental Protection Agency; BCG.

US Glass Infrastructure Map

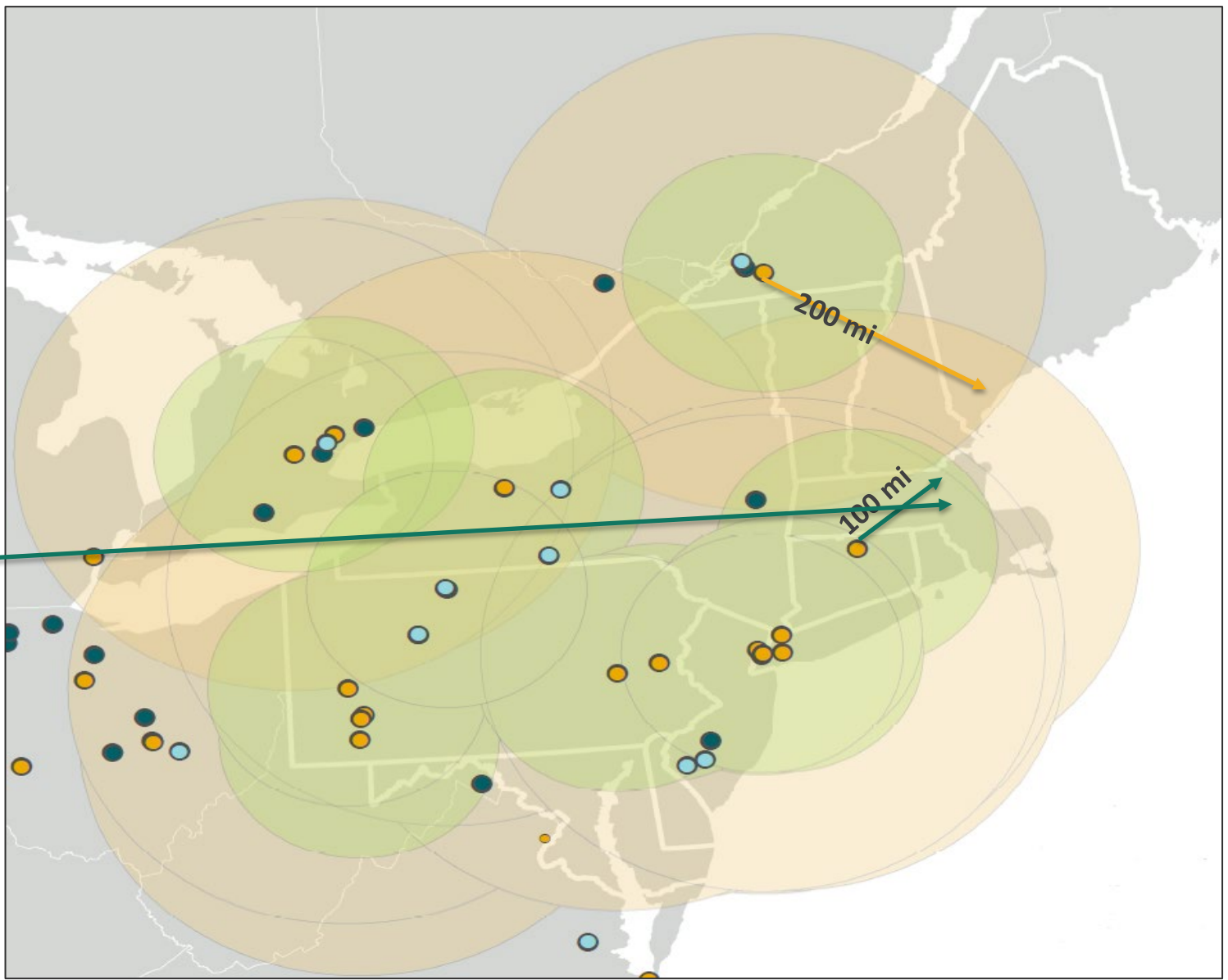


Glass Recycling Processors

Legend

- Glass Manufacturers
- Glass Recycling Processors
- Fiberglass Plants

New 2M
Resources Glass
Facility

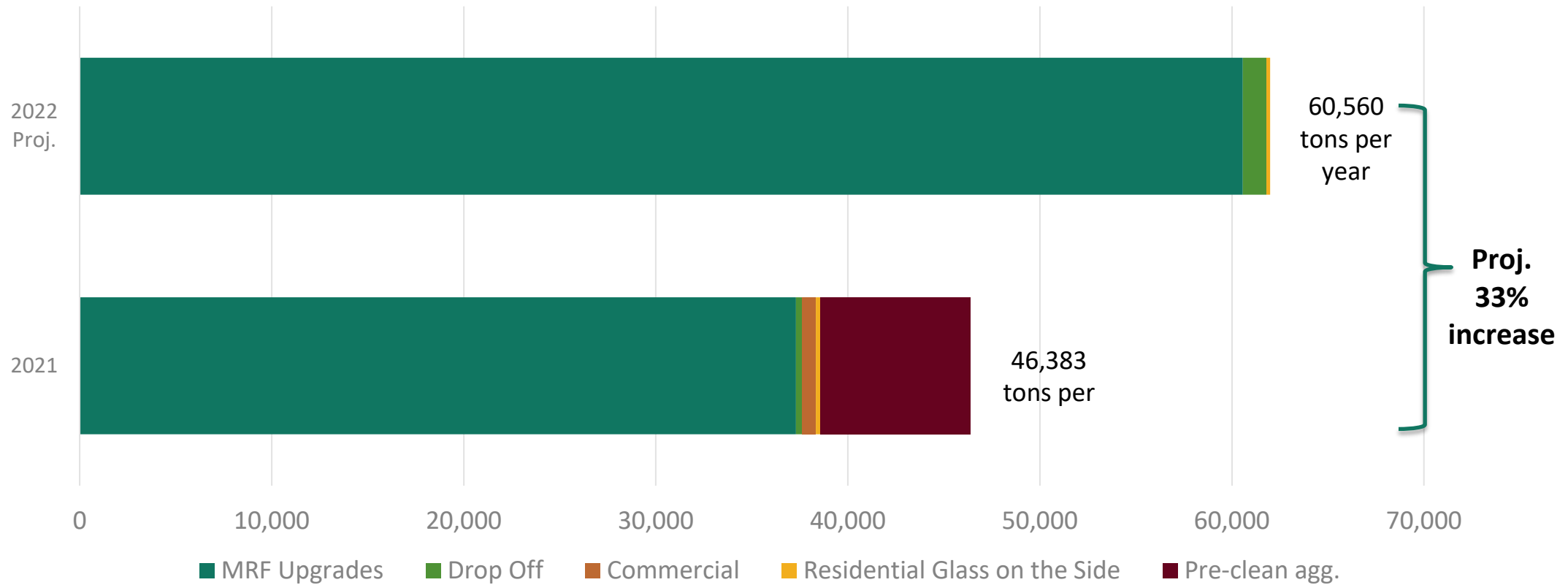


Field Engagement & Mission Support – 2022 YTD

Processing Access	Increase/Maintain Collection	Partnerships & Policy Engagement
<p>Expand reach and access to processing: pre-clean, hybrid, aggregation/hub & spoke, mrf upgrades</p> <ul style="list-style-type: none"> - Washington, DC Metro Region - North Carolina - Rockland, NY 	<p>Innovative financing to increase glass processing capability at MRFs</p> <ul style="list-style-type: none"> - Pennsylvania <p>Drop-Off Expansion</p> <ul style="list-style-type: none"> - North Carolina - Alpena, MI - Cuyahoga County, OH <p>Commercial Recycling Expansion</p> <ul style="list-style-type: none"> -Chicago, IL -Tucson and Phoenix, Arizona - Cuyahoga County, OH <p>Glass on the Side Expansion</p> <ul style="list-style-type: none"> - Stillwater OK <p>Maintain Curbside Collection</p> <ul style="list-style-type: none"> - Jacksonville, FL - Chesapeake, VA 	<p>Partnerships</p> <ul style="list-style-type: none"> • Washington State Recycling Development • North Carolina DEQ • Oklahoma Recycling Association • Atlanta Regional Commission • Southeast Recycling Development Council • Carolina Recycling Association • Jobs Ohio • Colorado Recycles <p>Policy</p> <ul style="list-style-type: none"> • California • Colorado • Connecticut • Iowa • Maine • New Jersey • New York • Oregon • Vermont • Washington

Incremental Cullet Growth

Estimated Tons of Annual Incremental Cullet from Committed Projects



*Assumptions will be reconciled at end of year.

Resources:

- Glass Recycling Guidebook
- Questions for Municipalities
- Letter for Community Glass Recycling Removal

In many regions across the country, gaps in the recycling supply chain (e.g., providing convenient recycling services before disposal) and



GLASS RECYCLING A QUICK STUDY

Glass food and beverage containers have been part of recycling programs across the U.S. for more than half a century. Glass is the ultimate recyclable – used in making new glass containers, building materials like fiberglass, concrete, tile, and drainage aggregate. Processed glass can become an industrial abrasive, sandblasting media, and reflective paint filler. There are a variety of options to recycle glass food and beverage containers, ranging from drop-off glass recycling, curbside glass recycling, and, in 11 states, container deposit return systems. This document's guidance can help glass champions determine how to improve local and regional glass recycling systems to build sustainable, robust glass recycling solutions.



QUESTIONS MUNICIPAL RECYCLING LEADERS SHOULD ASK ABOUT GLASS RECYCLING

PROCESSING

- What is the process for a conversation?
- What is the equipment used at a MRF?
- Are you aware of uses, road

ADMINISTRATION

- How can I satisfy the community?
- What are the recycling options?
- When are the Glass Certification requirements renegotiated?
- What are the schedule options?
- If asked to Glass Recycling, would include education, would include Find more
- Establish a value has d

RESOURCES

There are many options for municipalities to keep glass in their programs. Find out about other case studies, funding opportunities, and end markets. The following organizations work closely together to make glass recycling a success across the country and are ready to respond to your needs.

Glass bottles and jars are 100% and endlessly recyclable. Clean glass is in demand by industry, glass recycling reduces carbon emissions, and surveys consistently show that over 90% of consumers both want—and expect—to recycle them.

So what is really causing pressure to stop or change glass recycling in your area? Collection? Quantity? End markets? Is MRF contamination depressing the value of the material? Is it budget-related? Or is it an issue with hauler contract terms or budgets?

Before any decisions are made that will impact the community, it is important to understand the variety of avenues and options for glass recycling that can work for your residents.

The following questions can help determine the best direction for satisfying residents' expectations to recycle glass, coupled with available resources to do so effectively.

COLLECTION

- What type of collection for glass is most effective for your local system? Commingled single-stream collection may be less expensive, but is dependent on truck and MRF technology, and may not produce the highest return when processing and market value are considered. Glass "on-the-side" or dual-stream collection will produce cleaner streams. See [examples](#) of collection types for glass.
- Are there locations available for glass drop-off collection or at a transfer station?
- Are there opportunities for the commercial collection of glass (i.e., bar and restaurants)? See a few examples of successful [commercial collection](#).

QUANTITY

- How much glass is available for collection and recycling? Use this [chart](#) to make some estimates about available glass in your system.
- Are there nearby communities with similar needs that could create a partnership in a glass collection program or processing? Here are some examples of regional glass programs in [Northern Virginia](#).
- What resources can I call upon to help me expand or optimize my program? [The Glass Recycling Foundation](#) provides grants for glass recycling projects.

QUALITY AND END MARKETS

- What end-market resources are in my area? See [Glass Recycling Coalition Map](#).
- When is the last time the tipping room floor has been audited or an independent assessment of the quality of material has been made?
- Are you aware of the Institute of Scrap Recycling Industries standards for three-color mixed container glass? The GRC created a [MRF Glass Certification](#) based on the [ISRI MRF Glass Specification](#).

solutions. More information is available at [www.gri.org](#).

GLASS RECYCLING COALITION
The Glass Recycling Coalition (GRC), established in 2016, provides technical assistance and support to build strong regional glass recycling supply chains. More information is available at [www.glassrecycles.org](#).

GLASS RECYCLING FOUNDATION
GPI also worked with these same partners to launch the Glass Recycling Foundation (GRF) in 2018 to channel financial support to address critical gaps in regional glass recycling supply chains. More information is available at [www.glassrecyclingfoundation.org](#).

Glass Industry Organizations



glass
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institute

GPI.org



GLASS RECYCLING
COALITION

GlassRecycles.org



GlassRecyclingFoundation.org