

NGA GLASS CONFERENCE™ MILWAUKEE

AUGUST 6-8, 2024

NGA

NATIONAL GLASS ASSOCIATION with GANA



Sustainability & Recycling

Task Group Chair: Kyle Sword, Pilkington North America

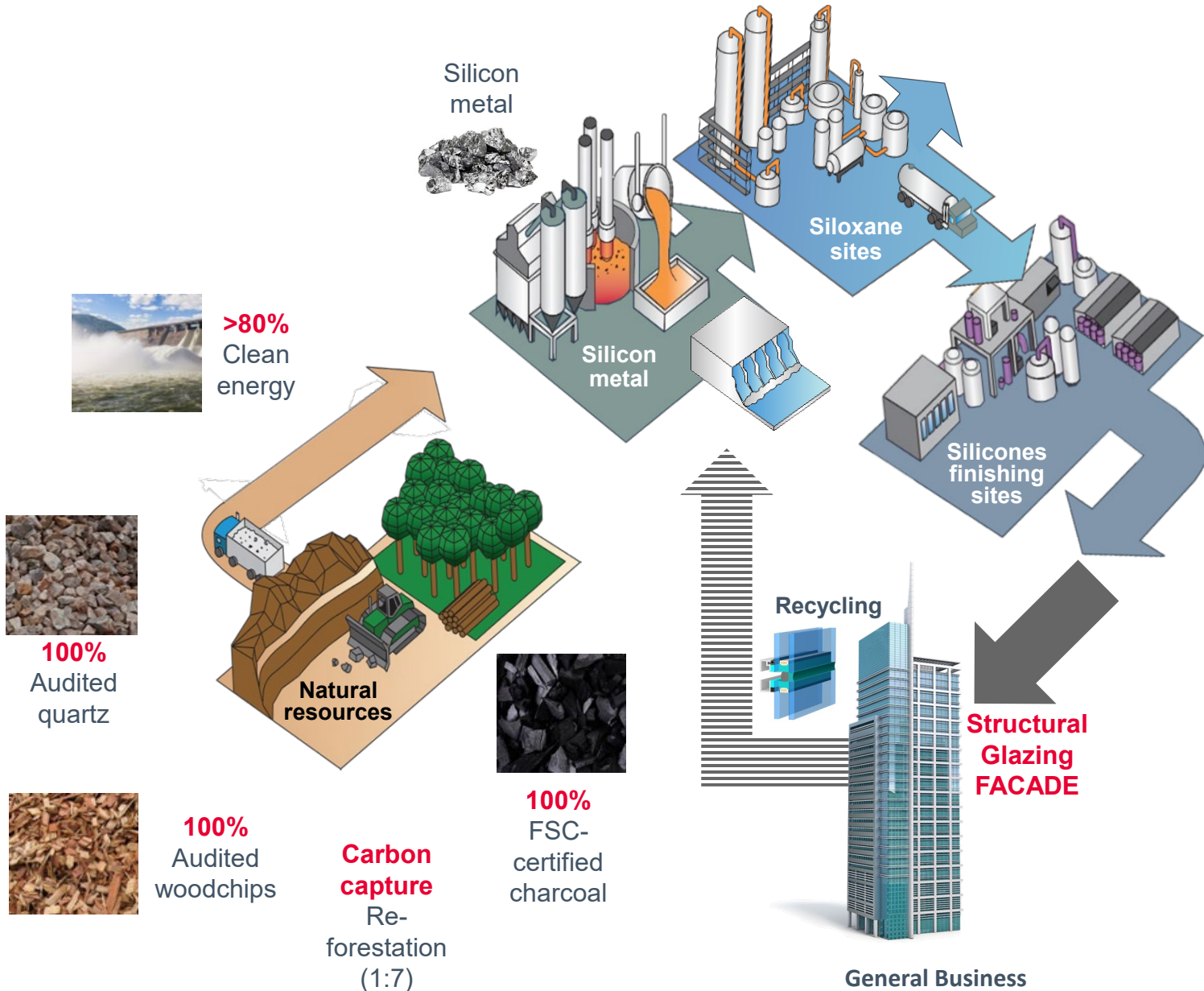
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Introduction by Brent Dull, Lead TS&D Specialist NAA Midwest Region

BACKWARD INTEGRATION – REDUCE CARBON EMISSIONS OF FULL VALUE CHAIN



Reduction of embodied carbon:

- **Renewable energy (not burning for power)**
- **Hydroelectric power (not burning for power)**
- **DOW own plantation (trees absorb carbon)**
- **Natural resources**
- **FSC certified raw materials**
- **Sustainable waste handling**

Backward integration is key benefit in reducing carbon footprints

Sustainability & Recycling

- Task Group Chair: Kyle Sword
- *Moving the Needle on Architectural Glass* now at ballot

Moving the Needle on Architectural Glass

Introduction

The National Glass Association's (NGA) FB40-14 *Recyclability of Architectural Glass Products* explains the types of glass products that can be recycled, clarifies misconceptions about recycling in the industry, details some of the benefits and value creation from glass recycling, and describes many of the end use products that can be created using cullet. Because of these values, many types of glass industries have described increased cullet use as a key strategy to achieve their 2050 sustainability goals. Despite this, recycling rates of all types of glass in the US remain much lower than Europe and other places in the world.²

The primary objective of this document is to explain many of the challenges currently within the U.S., describe some of the key risks involved with cullet reuse, communicate some of the global activities around cullet reuse, and propose some paths forward that members of the National Glass Association can proactively implement to help move cullet up the value chain and maximize cullet reuse value.

Key drivers for action in recycling:

- o Benefits at all levels of supply chain
- o Economic and environmental value
- o Creates circular economy and domestic raw material
- o Supports job growth
- o Reduces load on landfill
- o Improves glass furnace operations
- o Reduces glass furnace emissions

Glass Recyclability Challenges

Glass recycling rates and barriers around increased adoption rates in the U.S. has been well documented by organizations such as the Glass Packaging Institute, GMIC, and Glass for Europe. Inexpensive U.S. landfill rates, proximity to glass processing facilities and high associated freight costs, quality of glass cullet from primarily single-stream curbside collection, and lack of legislation requiring recycling (i.e. state-run "bottle bills") are all contributing factors to the low rate of cullet recycling in the U.S. In addition to these factors, the following obstacles are particularly important to consider if looking at reuse within the flat glass industry.

Contaminants

Contaminants in recycled glass, such as aluminum and nickel, could compromise the float bath equipment and negatively impact the quality of new glass, leading to issues like downtime and equipment care if extreme care is not

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- Updates to FB40-14
 - More information regarding benefits of recycling architectural glass
 - Potential addition of map of recyclers
 - Case studies



Glass Technical Paper

FB40-14 (2021)

Recyclability of Architectural Glass Products

Objectives

The interest in recycling architectural glass products is growing; however, information on companies offering recycling services is fragmented and difficult to find. A recent survey conducted by NGA showed that the architectural glass industry is interested in more recyclability of post fabrication products. Respondents indicated that roadblocks such as labor, cost, space and the lack of local resources prevent them from recycling glass waste. The purpose of this bulletin is to identify the different products that can be recycled and those that cannot be recycled. It also serves to clarify misconceptions about glass recycling and identify sources for recycling architectural glass. Finally, it provides examples of a variety of products that can be created or improved using recycled glass.

Introduction

Over one million tons of architectural glass is recycled annually throughout North America. Due to the weight of glass, the proximity between the glass fabricator, the recycler, and the end user is important. As shown in Figure 1, the supply chain begins with a glass fabricator shipping its glass scrap to a recycler. From there, the recycler mechanically cleans, crushes, and screens the glass to create a uniform material. This material (shown in Figure 2) is generally sold in bulk to an end user or manufacturer where it is melted for use in a derivative product. Occasionally, a glass recycler grinds the material to a fine powder to sell for use as a filler or an abrasive.

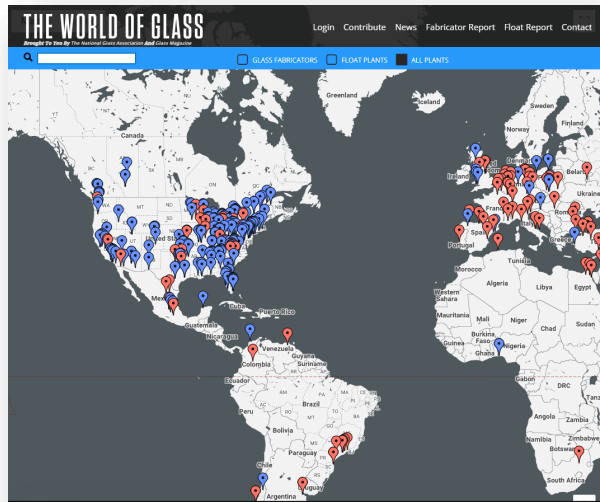
The desire for additional recycled glass is high and scrap glass generators have an opportunity to find a better economic alternative to discarding glass in a landfill.



Figure 1. Glass Recycling Supply Chain

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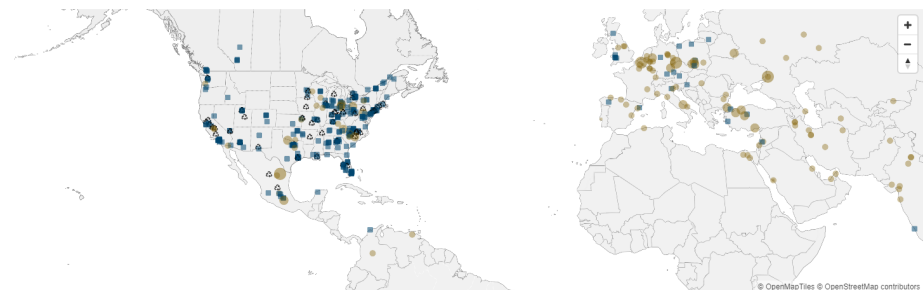


World of Glass
Float, Fabrication and Glass Recycling

Click on plant type to filter data displayed by map.

Plant type

- float
- fabricator
- ♻️ recycling



Source: National Glass Assoc., Glass Magazine

World of Glass Locations

Use the search bar to find a company, location (city, state, country or region) or facility type. Results are sortable.

Search...

World of Glass Map updates

- Updated data for North American glass fabrication & float plants
- **NEW** category: Recycling Plants
 - North American recyclers
 - Info on what types of materials are accepted by recycler
 - Proximity to float/fabrication plants
 - Available in October

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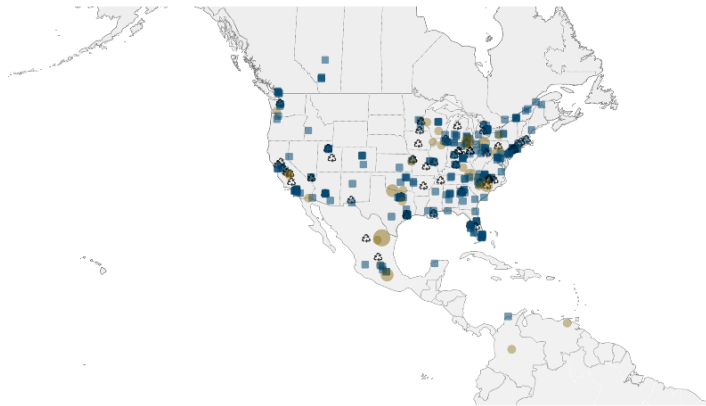
World of Glass

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Plant type

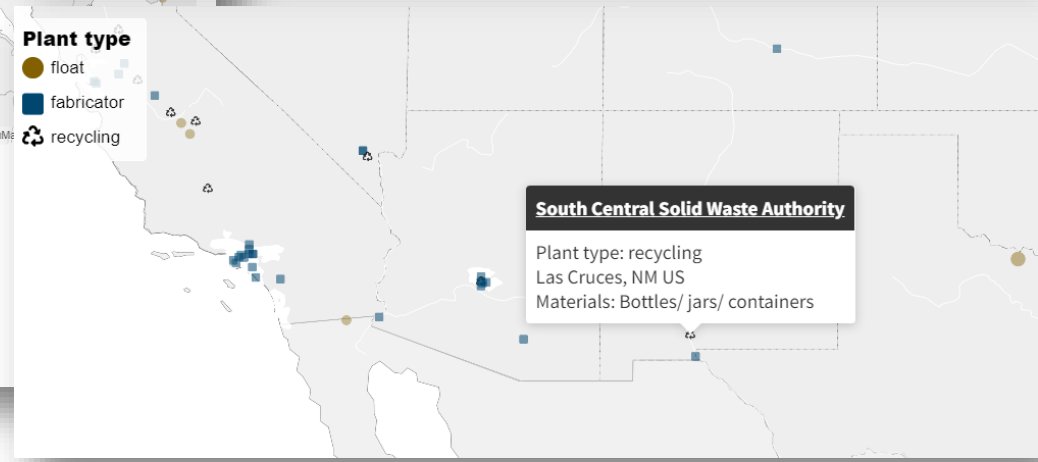
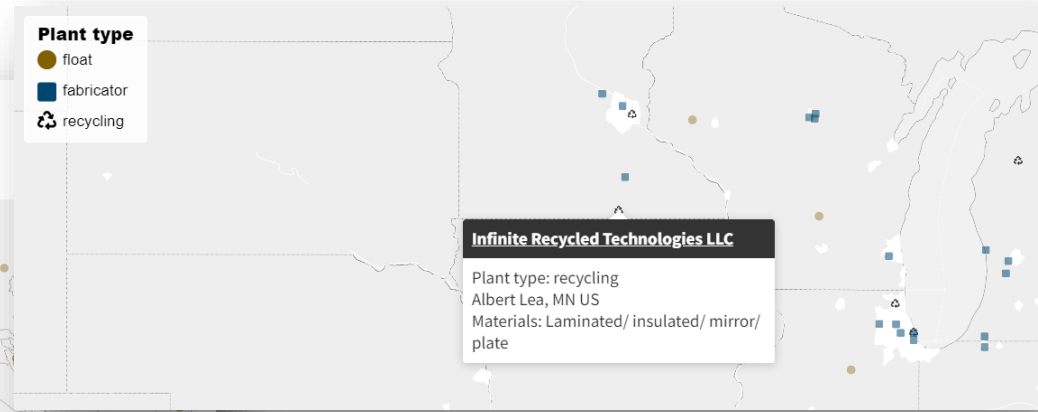
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Source: [National Glass Assoc., Glass Magazine](#)

World of Glass Locations

Use the search bar to find a company, location (city, state, country or region) or facility type. Results are sortable.



Recycling Across the Flat Glass Industry

- Recycling rates are trending positive
- Majority of recycled glass is post industrial
- Highest recycling rates occur with clean glass cullet
- Demand for recycled cullet is increasing

Why Recycle Glass?



Manufacturing new glass requires 15-16% more raw materials; manufacturing using glass cullet is 1:1.



Cullet melts at a lower temperature, therefore, requires less energy and reduces the amount of CO2 produced.



Every 10% of cullet used in place of raw materials saves 3% of energy and 5% of CO2 emissions.



Melting cullet results in a longer furnace life because cullet is less corrosive and higher temperatures are unnecessary.



Where is recycled glass going?

- **Abrasives/Reflective Beads**
approximately 600,000 tons/year
- **The Container Industry**
(jars and bottles) 10.5 million tons/year
- **The Fiberglass Industry**
1.5 million tons/year
- **Flat Glass Industry**
approximately 10 million tons/year

Strategies to Recycle More Glass

Local Law 97

Recycling as component in building retrofit/demolition

Increased recycling will create demand for recycled products

Innovative solutions to reduce the cost of recycling

Get the press involved!

INFINITE™
Recycled Technologies LLC

Thank you!

Let's collaborate for a greener tomorrow!