

Glass recycling overview – and a reality check

- **Glass makes up 4.5% of the overall waste stream and 13.1% of material recycled (US EPA 2013).** Glass plays an important role in achieving recycling goals.
- **General decline in the use of glass combined with growth of curbside programs has created a supply/demand imbalance.** Supply and demand by color varies across the U.S.
- **Glass beneficiation.** Glass flows from MRFs to beneficiation plants for sorting, crushing and cleaning before delivery to the bottle manufacturers or fiberglass companies. These are not located everywhere.
- **Glass is heavy.** Transportation is expensive.
- **Glass ingredients are plentiful and cheap.** Its primary ingredient



Glass Resource Locator

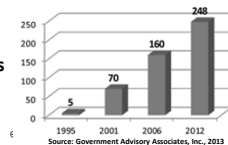


gpi.org/glass-resource-locator

Growth of single stream recycling



As more communities have moved to single stream collection, glass has become more contaminated and expensive to handle.



Single stream, glass and contamination

- + **Single stream increases the amount of material recycled.** Overall recycling increases by an average of 40% with wheeled cart-based single stream recycling collection (customer convenience).
- + **Single stream reduces overall collection cost.** Single stream collection reduces collection costs (largest portion of the cost)
- **Single stream collection requires investments in expensive MRF equipment.** These are expensive and process large volumes of material in order to cover the infrastructure cost.
- **Single stream collection increases the cost of MRF processing.**



Market flow

- Over 50% to beneficiation (bottles and fiberglass)
 - Strategic Materials (SMI)
 - Reflective Glass
 - Carry-all-Products
- Other uses include construction aggregate, and landfill road bed and cover



8

Relationship to contamination



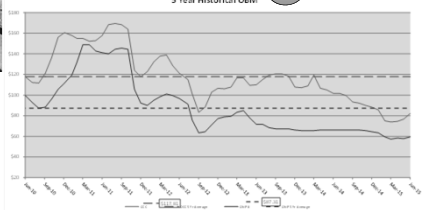
+

Increased processing costs

+



Contamination at the curb



=

Inability of MRFs to cover cost of processing.

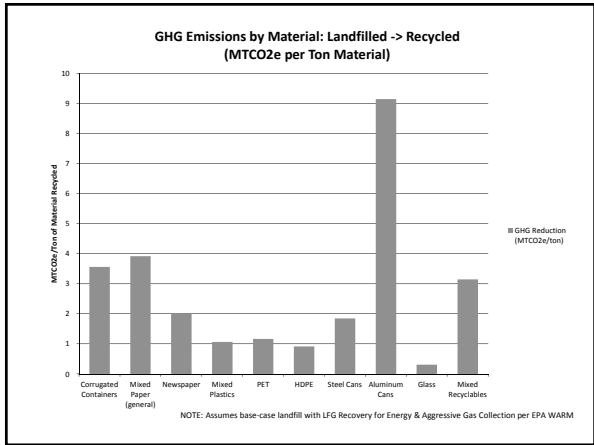
Challenges of Glass Recycling

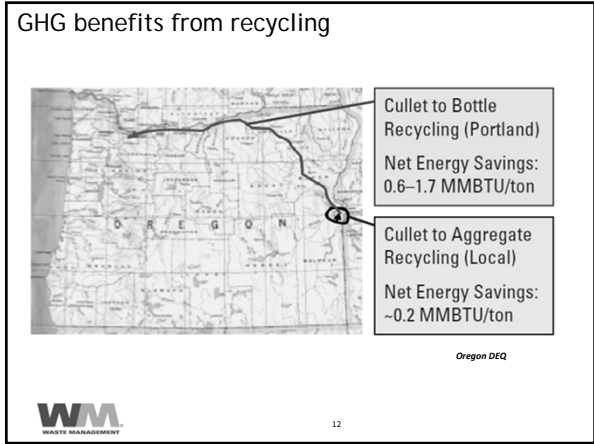
- Abrasive – hard on equipment
 - ✓ Truck beds
 - ✓ Recycling belts
- Contaminates other recyclables - reducing value of higher quality commodities
- Low economic benefits - low cost virgin materials
- Lower environmental benefits

No one is willing to pay more for glass.
More cost invested does not lead to more revenue for glass.



10





12

Processing Investment



WM continues to test glass cleaning equipment. Equipment can separate paper, metals and other fines, but cost and maintenance often exceed revenue improvement.





16

Alternative Collection Options: Portland, OR

Oregon has a container deposit system for some types of bottles. They also have been heavily influenced by PNW paper markets to keep glass out of single stream programs.

Glass is collected in separate containers and separate trucks in Oregon. This increases the cost of recycling collection but minimizes glass recycling challenges due to contamination.





17

Salt Lake City - Momentum Recycling

Residents in Salt Lake City can subscribe separately to glass collection. For an additional \$7/month, they can set out a 35 gallon bin provided by Momentum Recycling. Momentum processes and markets the glass for recycling.

Separate drop-off locations are also provided for no additional fee.



18

Kansas City - Ripple Glass

- Ripple Glass opened its processing plant in Kansas City in 2009.
- Glass is collected at 120 drop off sites in the Kansas City area.
- The expect to recycling ~40,000 tons/year of glass in Kansas City, for a 20% glass recycling rate (up from 5%).
- Glass collected in this system has a 98% recovery rate (as opposed to 40% for single-stream)



19

Efforts along the entire value chain

- WM conducts internal audits of material quality
- Working with our suppliers/customers to improve inbound quality of material
- We are working with end markets for continuous feedback on quality
- We have developed an understanding of the cost and value of glass to our business to value glass correctly in recycling programs.



**RECYCLE OFTEN.
RECYCLE RIGHT.**

Mixed Curbside
Residential Recycling
Myth Busters

Be an official
RECYCLING AMBASSADOR

Campaign Information

How to Recycle Right

PS Planning City
Implementation

PS Toolkit

R12

Research

www.recycleoftenrecycleright.com

Summary

- There is no single solution for persistent glass recycling challenges. Changes are necessary at each point along the supply chain.
- While there may be sufficient demand for acceptably processed cullet by the glass bottle and fiberglass manufacturing industry, supply and demand of specific colors do not always balance by geography.
- Municipal contracts are beginning to reflect the cost of recycling glass
- As the cost of recycling glass increases, communities are moving towards alternative collection methods for glass.
- Municipal Zero Waste goals ensure that glass recycling will be an part of our service offerings in many communities.



22

Thank you!
srobinson@wm.com
