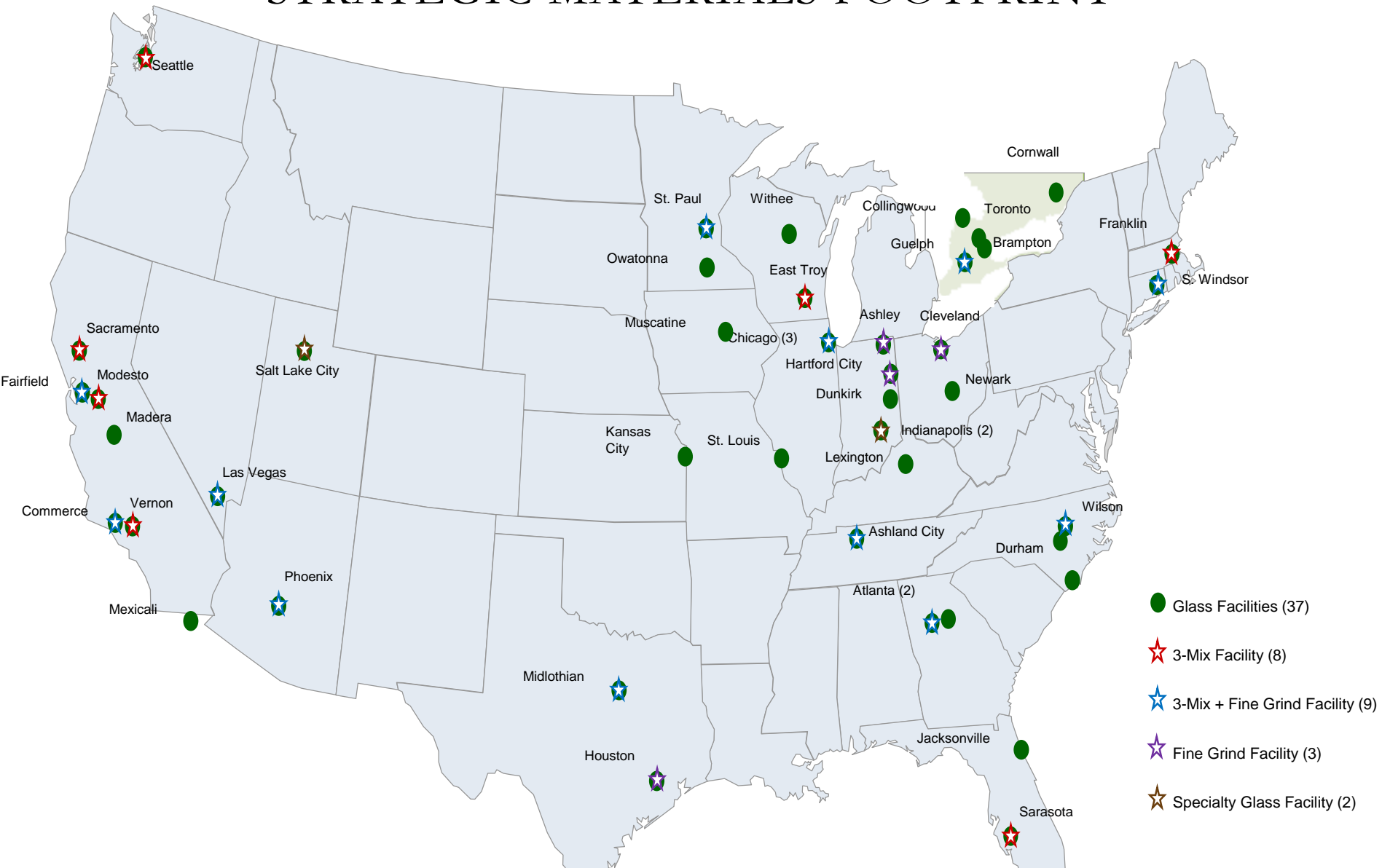




Glass Recycling Update

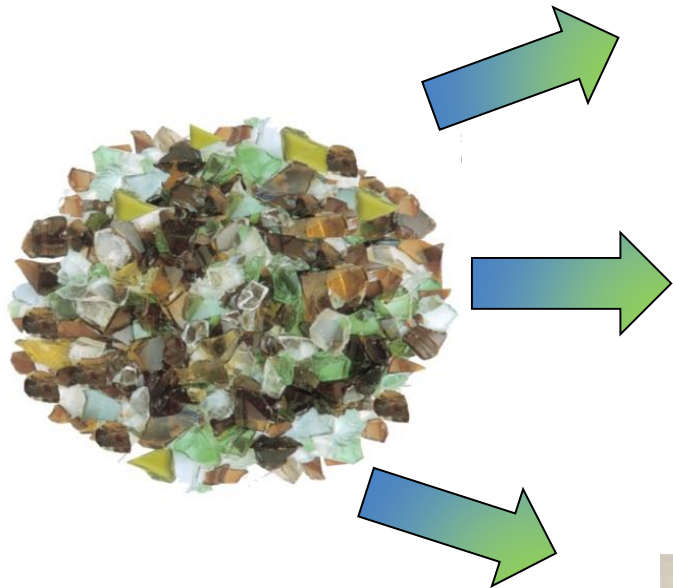


STRATEGIC MATERIALS FOOTPRINT



SMI has the Largest Network of Glass Recycling Plants in North America – the facilities are strategically located near our customers allowing for lower shipping costs and better service

What We Do – Products Using Recycled Glass



Challenges to Glass Value ...

Before



2% yield Loss

Today



20-60% yield loss



Some reasons for the quality slide of glass:

- Collection favored convenience over quality
- Higher contamination being placed in curbside recycling by homeowners.....
Insufficient education, smaller garbage bins, Recycling is free vs garbage, automated collection vs manual (no inspection), etc.
- Production issues ...Older Mrf line layouts, lines running over capacity, poor metrics, etc.
- No glass specification by cities
- Mrf's are unprofitable and some are pushing costs on to secondary processor, moving residue to profit share

3-MIX Single Stream Matrix (market specific)

Steps taken:

- Share our quality measurement system
- Directly tie pricing to quality received which created today's **friction point**.

Undersize

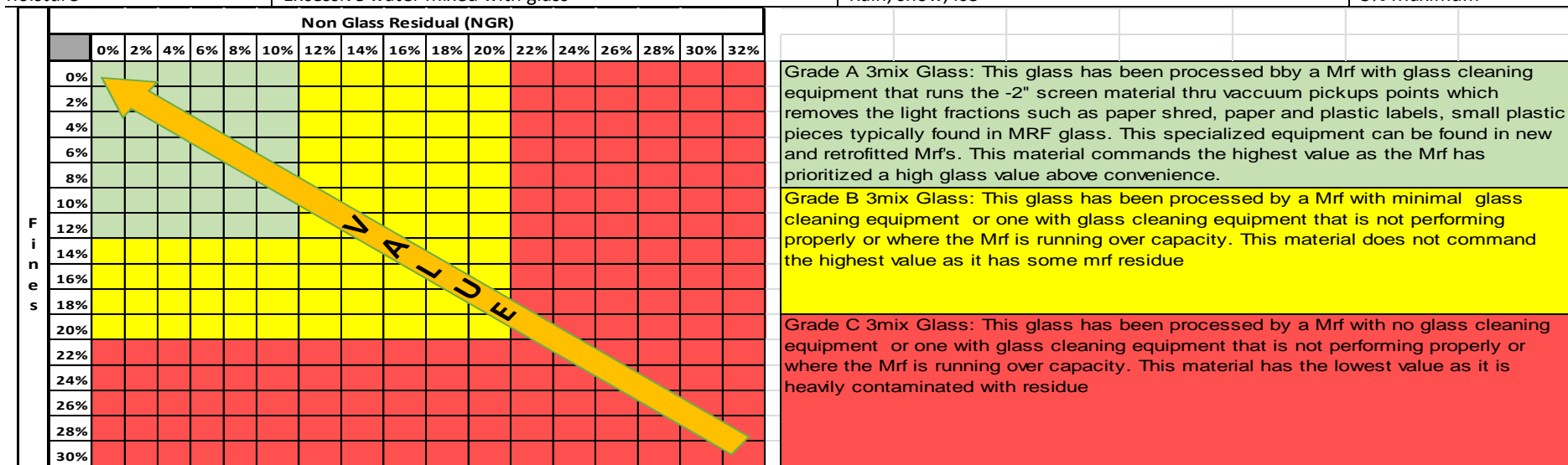
NGR		0.0%	1.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
		0.0%	1.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
	\$	20.80	\$ 20.56	\$ 19.60	\$ 18.40	\$ 17.20	\$ 16.00	\$ 14.80	\$ 13.60	\$ 12.40	\$ 11.20
	\$	19.60	\$ 19.36	\$ 18.40	\$ 17.20	\$ 16.00	\$ 14.80	\$ 13.60	\$ 12.40	\$ 11.20	\$ 10.00
	\$	14.80	\$ 14.56	\$ 13.60	\$ 12.40	\$ 11.20	\$ 10.00	\$ 8.80	\$ 7.60	\$ 6.40	\$ 5.20
	\$	6.80	\$ 6.56	\$ 5.60	\$ 4.40	\$ 3.20	\$ 2.00	\$ 0.80	\$ (0.40)	\$ (1.60)	\$ (2.80)
	\$	2.80	\$ 2.56	\$ 1.60	\$ 0.40	\$ (0.80)	\$ (2.00)	\$ (3.20)	\$ (4.40)	\$ (5.60)	\$ (6.80)
	\$	(3.20)	\$ (3.44)	\$ (4.40)	\$ (5.60)	\$ (6.80)	\$ (8.00)	\$ (9.20)	\$ (10.40)	\$ (11.60)	\$ (12.80)
	\$	(9.20)	\$ (9.44)	\$ (10.40)	\$ (11.60)	\$ (12.80)	\$ (14.00)	\$ (15.20)	\$ (16.40)	\$ (17.60)	\$ (18.80)
	\$	(16.20)	\$ (16.44)	\$ (17.40)	\$ (18.60)	\$ (19.80)	\$ (21.00)	\$ (22.20)	\$ (23.40)	\$ (24.60)	\$ (25.80)
	\$	(23.40)	\$ (23.64)	\$ (24.60)	\$ (25.80)	\$ (27.00)	\$ (28.20)	\$ (29.40)	\$ (30.60)	\$ (31.80)	\$ (33.00)
	\$	(31.40)	\$ (31.64)	\$ (32.60)	\$ (33.80)	\$ (35.00)	\$ (36.20)	\$ (37.40)	\$ (38.60)	\$ (39.80)	\$ (41.00)
	\$	(37.00)	\$ (37.24)	\$ (38.20)	\$ (39.40)	\$ (40.60)	\$ (41.80)	\$ (43.00)	\$ (44.20)	\$ (45.40)	\$ (46.60)

Poor Value is often misinterpreted as Poor Markets

Proposed Glass Specification

Material Recovery Facility-derived 3-Color Mixed Container Glass ("MRF Glass") DESCRIPTION FOR ISRI REVIEW: MRF Glass consists of crushed or whole scrap flint (clear), Amber (brown), and Green (emerald) container/bottle glass made from soda-lime-silica. All MRF glass must be free of medical or hazardous wastes and poisonous or other harmful substances or liquids. These standards and practices apply to 3-color mixed glass for purchase or sale in the United States and Canada. Transactions covering shipments to or from other countries may also be in accordance with these standards and practices and may be modified by mutual agreement between buyer and seller. These specifications are guidelines for buying and selling MRF glass are always subject to the buyer and seller's agreement. It is recognized that MRF Glass can be mixed with other materials for the convenience of recycling and efficient collection and that quality levels and pricing varies widely based on the amount of contamination mixed in with the glass. Outthrow and Prohibitive tolerances for Material Recovery Facility-derived 3-Color Mixed Container Glass are:

Outthrows	Description	Examples	Tolerance
Non- Glass Residuals (NGR)	Common program and non-program materials found in Recyclable Single and Dual Streams recycling programs entering a Material Recovery Facility	Non-Glass and organic materials such as paper, wood, food-or plant particles, metal/plastic closures, rocks, and other inert materials and fines	Varies...See below chart
Undersized or pulverized material ("Fines")	Undersize Glass particles < 3/8" (or < 1/8"*)	Mixed color glass particles crushed so small as to render optical sortation useless	Varies...See below chart
Ceramics	Broken bits of household ceramic	Dinner plates, mugs, cups, etc.	2% Maximum
Moisture	Excessive water mixed with glass**	Rain, snow, ice	5% Maximum



Prohibitives	Description	Examples	Tolerance
Material which is Prohibited and subject to load Rejection	Materials which contaminate whole loads of MRF glass rendering it unusable for melting	PyroCeramics (Fireplace glass); gypsum/wallboard/drywall (including glass from construction demolition processing with mixed CaCO3 fines); common moisture-absorbing desiccants (silica gel beads, alumina pellets, closet paks,	.025% Maximum

Cities and MRF Operators need to agree on a glass specification to drive transparency and accountability

HOT SPOTS

Limited outlets, color changes

Limited outlets, color changes, and specification changes has resulted in imbalance

New capacity under construction

Low cullet usage rates & Inconsistent use

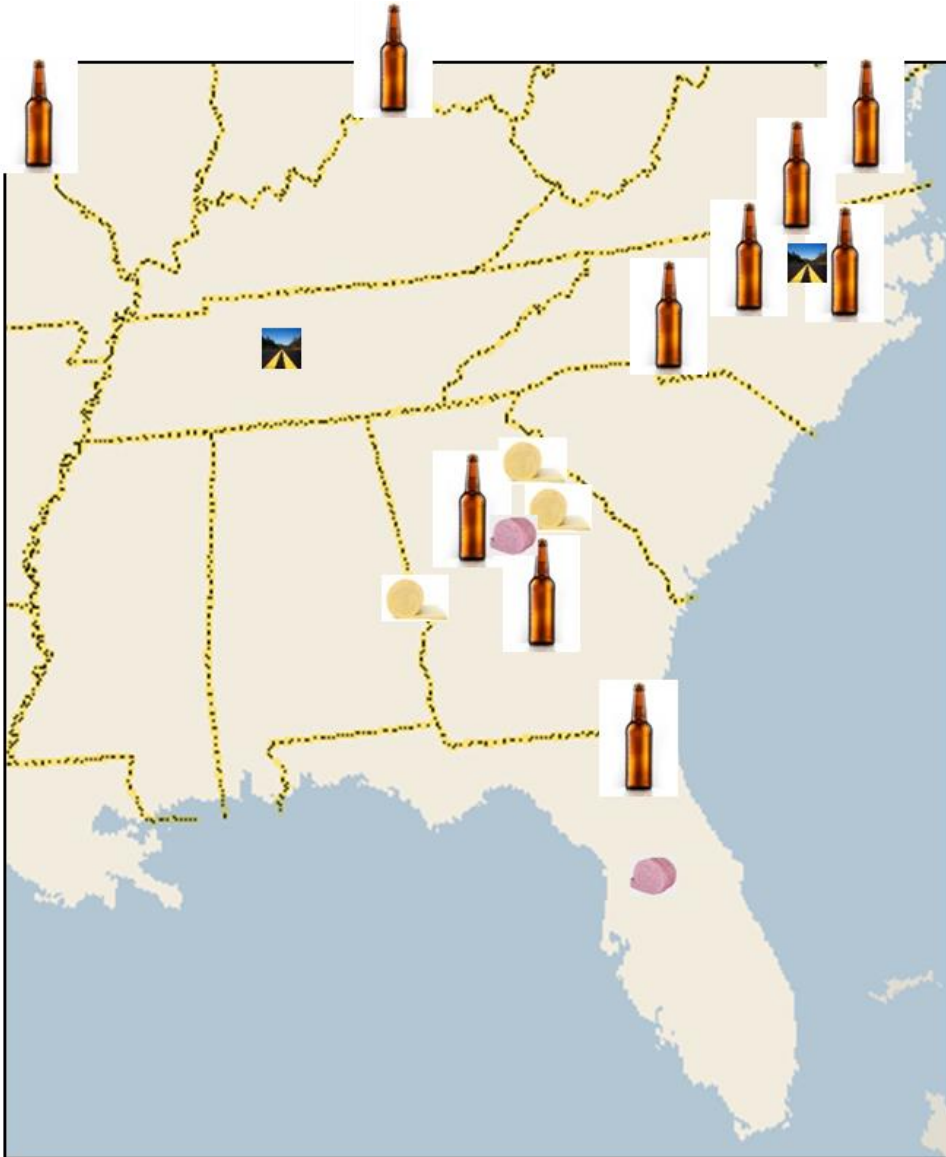
New Opportunity

Low cullet supply & usage

Hot spots, often have, no fiberglass markets/plants and inconsistent usage rates by container industry.

Efforts are underway to develop new markets and/or export material to resolve market issues.

Southeast Glass Review



- Fiberglass markets exist in Georgia and use 25-75% recycled content.
- Container Industry has many plants in region but they typically run only 20 - 40% cullet.
 - Poor Plant performance where they produce in house cullet. Need to ratchet usage up to absorb regions surplus
- Container industry imports substantial amounts of cullet from other regions into the SE.
- Industries and companies have different ways to economically model cullet usage

Batch (cost savings model)

Vs.

Batch + fusion + energy savings+
furnace life savings+ air emissions
(total cullet value model)

Difference of approx. \$50/ton in value