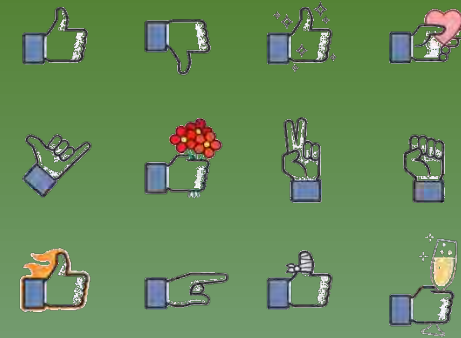




Glass Recycling in Wisconsin

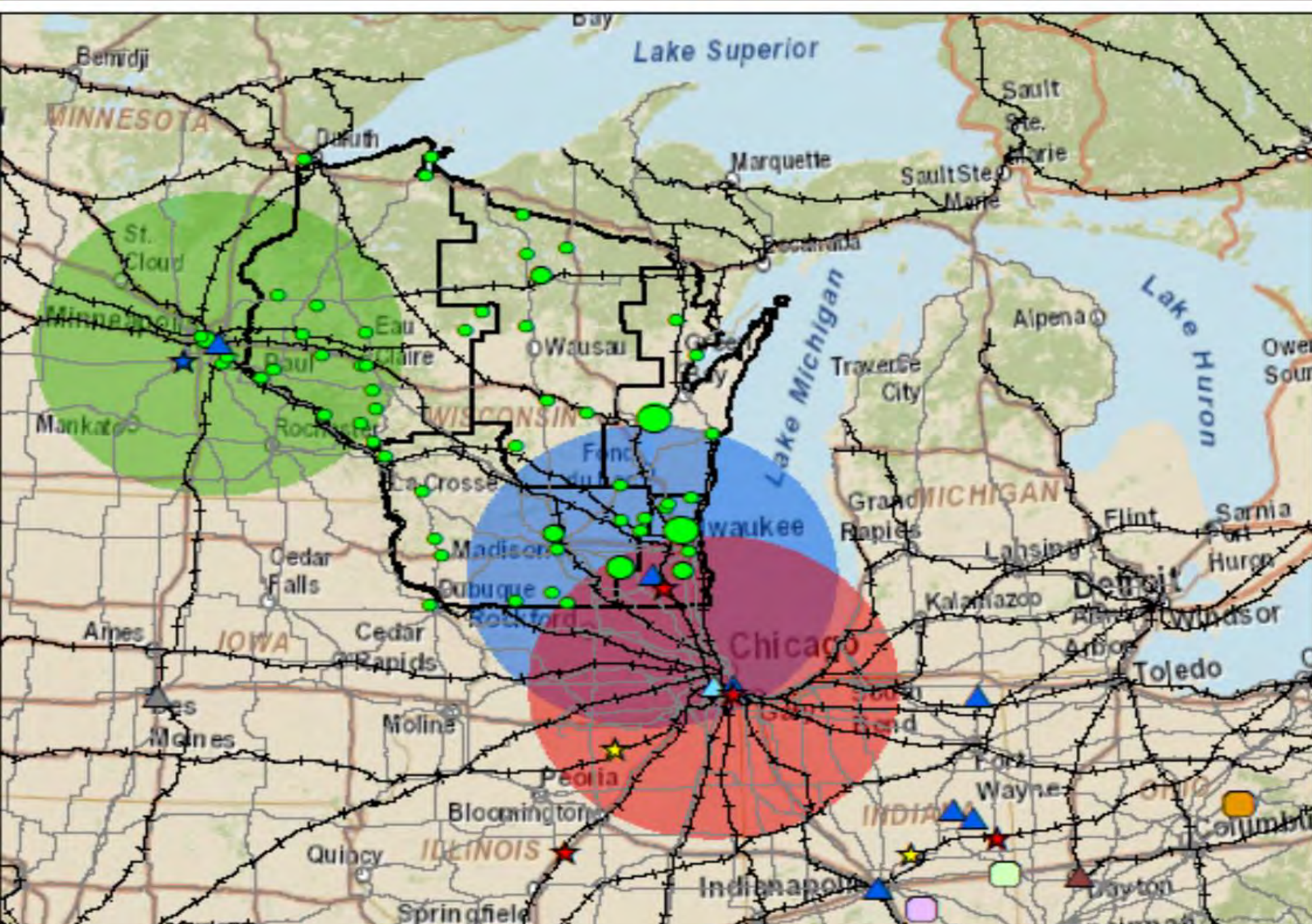
**Report by the Associated Recyclers of Wisconsin
Glass Taskforce**



Status of Glass Recycling in Wisconsin

- High volumes recovered with high contamination
- Revenue typically does not cover costs of processing & transport
- Supply and demand is out of sync
 - One secondary processor & end market in WI = limited competition
 - Recycled cullet vs. virgin material costs
 - Single stream and contamination
 - Law requires collection regardless of demand/markets
- End markets want cleaner product = high costs, minimal ROI for MRF's
- Geography (source to market)

Recycled Glass Facilities & Markets



Legend

Glass Markets

- GPI Member Manufacturing Plant
 - ★ Anchor Glass
 - ★ Ardagh Glass
 - ★ O-I

Recycled Glass Processing Facility

- ▲ Mid America Recycling
- ▲ Resource Management
- ▲ Rumpke
- ▲ Strategic Materials

Fiberglass Manufacturing Facility

- Knauf Insulation
- Johns Manville
- Owens Corning

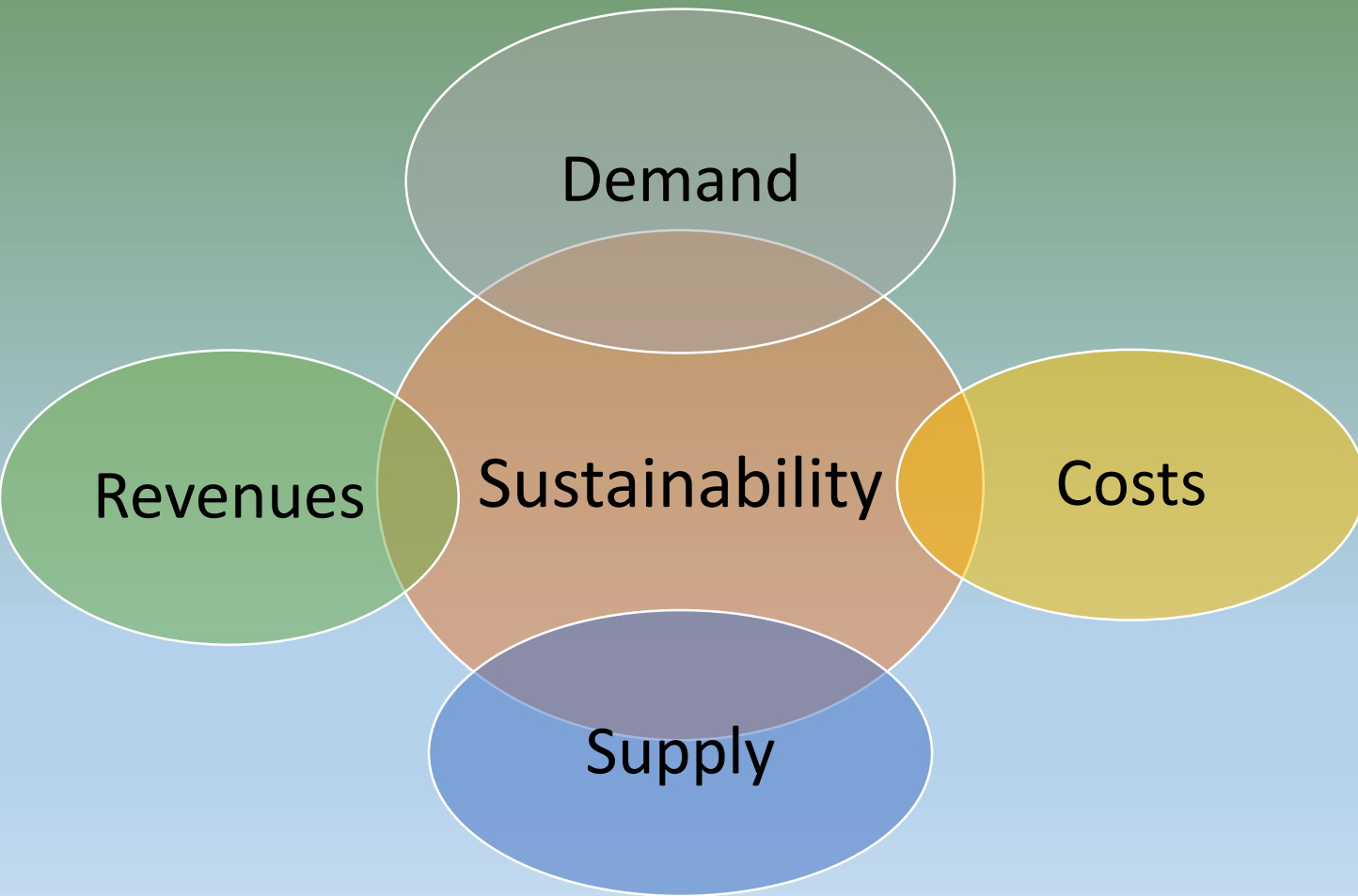
MRF's by Tonnage

- 0 - 2574
- 2575 - 8068
- 8069 - 20010
- 20011 - 36707

- +— Railroads
- Major Highways

- ▭ Regional Borders
- Strategic Mtls - WI (100 mi Radius)
- Strategic Mtls - MN (100 mi Radius)
- Resource Mgmt - IL (100 mi Radius)

Status of Glass Recycling



- **Demand**
Reliable, Viable, Stable
- **Supply**
Consistent, Clean, Stable
- **Costs**
Processing, transport
- **Revenues**
Cover costs

Status of Glass Recycling

- Still viable option
 - Less expensive and more sustainable to recycle than landfill
 - Environmental benefits include (GPI):
 - Conservation of natural resources (ton for ton)
 - Lessens demand for energy & reduces emissions
 - No processing by-products (closed-loop system)
 - Glass can be recycled endlessly with no loss in quality or purity
- Cooperation is crucial for the future

Glass Taskforce Members



	Member Name	Affiliation
Chairs	Rebecca Mattano Brian Jongetjes	Waukesha County John's Disposal
Contributing Members	Jill Martin Brenda Quinnell Abbie Repinski Amanda Haffele Lynn Morgan Rick Meyers Alan Albee David Pellitteri	Outagamie County Adams County Waukesha County Dunn & Eau Claire County Waste Management City of Milwaukee Eagle Waste & Recycling Pellitteri Waste Systems
AROW Liaison	Meleesa Johnson	Marathon County
Representatives	Chad Lawler Amber Meyer-Smith	Wisconsin Legislative Strategies Clean Wisconsin

Glass Taskforce Mission

Research, evaluate and prepare recommendations on market-based, technical and regulatory solutions along with implementation strategies for container glass recycling in Wisconsin.



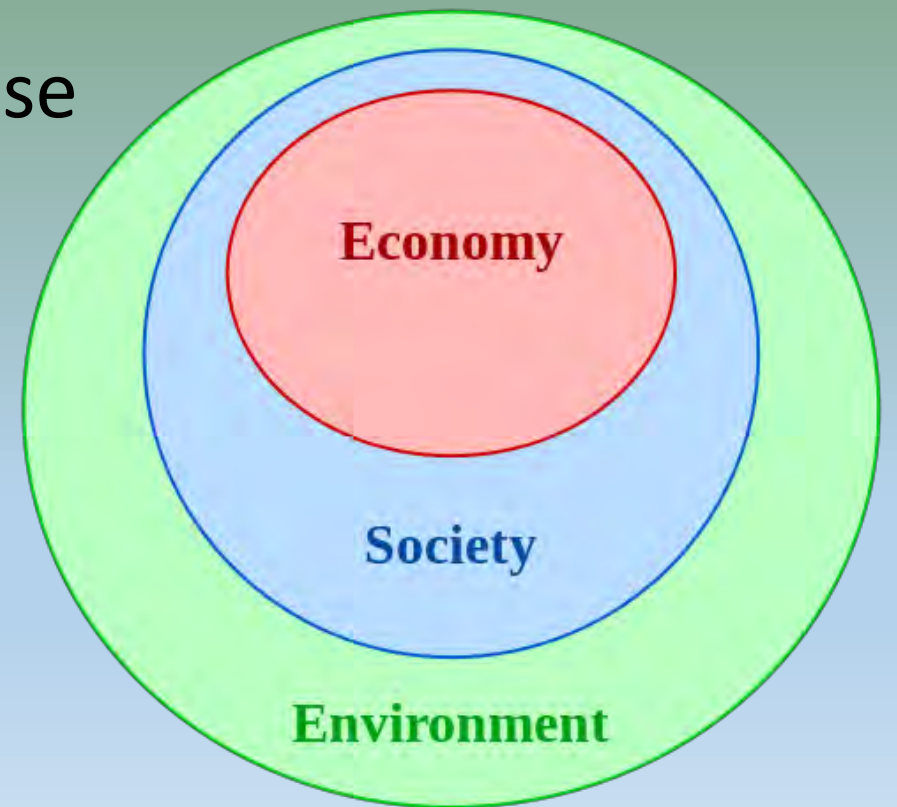
Glass Taskforce Goals

1. Research, understand and present industry standards and specification for glass grades.
2. Evaluate beneficial reuse options for mixed container glass.
3. Evaluate current and identify potential end markets.
4. Research and summarize State and National recycling programs, markets and beneficial reuse to support recommendations.
5. Develop recommendations with strategies and regulatory/statutory requirements.



Glass Taskforce Recommendations

1. Materials Recover Facility (MRF) Technology
2. Industry Standards and Specifications
3. Non-Cullet Recycling & Beneficial Reuse
4. Regulatory & Legislative
5. Partnerships



Recommendations – MRF Technology

- Modern MRF's produce glass that is broken, not color sorted with 10-30% non-glass residue
- Three-mix glass is sent to a secondary processor in Wisconsin, Minnesota, or Illinois

Recommendations for MRF Operators:

1. Review installation of vacuum system and/or screen to remove light weight contaminants
2. Negotiate with contracted processor/buyer
 - a) Financial assistance for clean-up systems
 - b) Contract rates/revenues
3. Review GPI grant options to improve glass recycling and recovery



Recommendations – Industry Standards

- All other major recycled commodities have established specifications (ISRI)
- GPI, GCI & ISRI working to develop a voluntary spec for recycled glass at MRF's
 - Anticipated completion prior to release of report - not yet published

Recommendations:

1. State wide industry associations and MRF operators should support the GPI efforts to establish and implement national glass recycling standards and specifications to include cullet and non-cullet recycling options.

Non-Cullet Uses of Glass

1. Uses of glass that are within the disposal limits of a licensed landfill

- Alternative Daily Cover (ADC)
- Road base material
- Screening Berms
- Decking
- Aggregate around piping



*Additional Note: Three (3) definitions of recycling.
Support efforts for one common definition (FORWD)*

Non-Cullet Uses

2. Uses of glass that are outside the disposal limits of a licensed landfill

- Drainage Medium or backfill for buried utility lines, drain tile
- Aggregate in under a building foundation
- Aggregate in road base or parking lot sub base
- Component in glasphalt pavement
- Sand blasting medium
- Decorative landscaping material
- Septic tank treatment systems*
- Flowable fill*
- Glass Sand*
- Water and Wastewater filter media*



*Alternative uses not currently listed on the low hazard exemption form

Non-Cullet Uses

3. Uses of glass in asphalt road base

- Does not require low hazard exemption*/WDNR approval based on
 - Storage location, security safety
 - Size less than ½ inch (approval required for larger)
 - Contaminants kept to an amount that does not impede effectiveness**
 - Used and designed in accordance with generally accepted engineering practices**

**A low hazard exemption would be required for subbase proposals not in roadways or any other use that does not meet exact exemption criteria.*

***Local transportation departments could write acceptable specification for glass in roadway projects to demonstrate contaminate level with not impede effectiveness and the glass will meet general accepted engineering practices.*

Recommendations – Non-Cullet Uses



Recommendations:

1. Encourage cooperation (LUG, MRFs, PW, DOT, Private)
2. Support WDNR development of standing Beneficial Use determinations
3. Review and revise language in regulations and required processes to accelerate the process for non-cullet uses of recycled glass
4. Standardize language that clearly defines: recycling, beneficial reuse and roadways



Recommendations – Non-Cullet Uses

Recommendations Cont.:

5. Request industry associations to hire consultant/engineer to prepare report/specifications for non-cullet uses
6. Request support & development of WDNR guidance documents for cullet, non-cullet, alternative & beneficial use & low hazard waste requirement, standards/specifications
7. Evaluate components & identify possible modifications to the Low Hazardous Waste Exemption

Recommendations - Regulatory

- Current legislation bans glass from disposal in the landfill and requires mandatory recycling
- Several options to support glass recycling including:
 - Glass Bottle Bill
 - Update and Expand Low Hazard Waste Exemption or develop standing beneficial reuse determination
 - Update Statute allowing RUs to request variance to landfill ban to include the costs of processing & transportation



Recommendations:

1. Request a guidance document from WDNR that is user-friendly, summarizes connections to Administrative Rules, Codes and Statutes for all options under recycling and beneficial reuse.

Recommendations - Partnerships



- There are many opportunities for partnerships within the public and private sectors to develop, implement and sustain viable solutions for economical glass recovery, recycling and manufacturing

Recommendations:

1. University of Wisconsin – Milwaukee Center for Byproduct Utilization (CBU)
2. Wisconsin Economic Development Corporation
3. Glass Packaging Institute (GPI) and the recently formed Glass Recycling Coalition (GRC)
4. Statewide Public-Private Cooperative for Secondary Processing

Glass Taskforce Conclusions



- Successful glass recycling programs depend on:
 - Availability of strong, diverse and expanded end markets
 - MRF size and technology, location (transportation) and collection system (mixed, source separated)
 - Supply and demand within the free market system
 - Quality
 - Cooperation, partnerships and education

Glass Taskforce Next Steps

- AROW Board approval
- Upon approval, implement promotions plan
 - Press Release
 - Social Media
 - Websites
 - Submit to local, state and national private and public partners/organizations
 - Schedule a press conference

