RHODE ISLAND FIBERGLASS VESSEL RECYCLING PILOT PROJECT

Rhode Island Marine Trades Association

CWMA Annual Conference
Victoria, British Columbia
October 25th, 2019
RI MARINE TRADES ASSOCIATION

• Founded in 1964, RIMTA is a trade association representing all aspects of the RI recreational marine industry

• **Our Vision** – Position Rhode Island as a worldwide leader in the marine industry

• **Our Mission** – Grow the Rhode Island marine industry through advocacy, education and promotion
# of Firms Statewide
1,712

Annual Revenues (+/- 13%)
$2.65 billion

Jobs (+/- 1%)
13,337

- Value Added: $2.64 billion = about 5% of RI economy
- Total Employment Effect: 26,921 jobs
- Output Effect: $4.61 billion
• The first generations of fiberglass recreational vessels have begun to reach “End-of-Life” status (ELV)

➢ Based on the global increase in vessel manufacturing (1980’s – 90’s), growth rate of the legacy fleet is expected to increase

➢ Between 2006 – 2017, approximately 2.9 million fiberglass recreational vessels were retired in the United States (NMMA, 2018)

➢ End-of-life vessels present a series of interconnected environmental and economic challenges for coastal communities

➢ Traditional disposal options (i.e. landfilling) continue to become more costly / limited
In 2016, RI Sea Grant identified cement kiln co-processing as a potential pathway for fiberglass vessel materials

- Fiberglass composite can act as a substitute for fossil fuel as well as the raw materials needed for cement production
- Shredded fiberglass replaces the thermal energy provided by coal and petroleum byproducts, producing less greenhouse gas emissions
- Constituent elements of the fiberglass (silica, calcium and alumina) are encapsulated in the finished cement clinker, leaving no ash byproducts or waste behind
- Cement Kiln Co-Processing is not a form of traditional waste-to-energy incineration
PARTNERSHIP DEVELOPMENT

Pilot Project Co-Conveners

Match Funding Provider

Administrative Partner
Organizational Resources / Research Capability
Staff Resources
Partnership Management

Funding Partner
501(c)3 Non-Profit Foundations / Groups
Industry Sponsorship
In-Kind Resource Providers

Recycling Network Partner
Vessel Preparation
Transportation Services
Heavy Equipment Resources
Waste Management Expertise

State Agency Partner
Regulatory Guidance
Partnership Selection / Support
Outreach / Network Capabilities
OUR PROCESS

Boatyard / Marina

- Preparation & Dismantling
  - Liquid Waste Pump-Out
  - Hazard Removal
  - Ancillary Metal Removal

Salvage / Preparation Partner

- Preexisting Recycling Outlets
- High Value Scrap Recovery
- Hardware, Engine Salvage

Central Recycling Facility

- Initial Size Reduction
- "Pre-Process" Shredding
- Short-term Storage

End-User Kiln Facility

- Fuel Blending
- Material Analysis
- Kiln Application

In-State Transportation

Transportation

- 18 ton over-road limitation
PILOT PROJECT VERIFICATIONS
2018-2019

1) Fiberglass vessel materials can be successfully implemented in a U.S. kiln

2) Localized networks can satisfy cement industry material preparation standards

3) Pre-existing waste management resources can streamline key activities

4) State agencies can ensure navigation / compliance within regulations

5) Outside industries see value in cement kiln pathway

6) Federal interest exists in nationwide expansion efforts

7) “Scaling up” requires improved logistics / additional economic data
Based On Avg. Submission
21 ft. – 1.4 t Sailboat

**Cost per Boat (Total Process)**

Including Boatyard / Marina Expenses: USD $1,136 ($54.09 / ft.)
Excluding Boatyard / Marina Expenses: USD $925 ($44.01 / ft.)

**Cost per Boat (Landfilling)**

Full-Hull Disposal: Approx. USD $636 ($30.28 / ft.)
‘Associated Marine Waste’ Disposal: Approx. USD $586 ($27.90 / ft.)

**Cost per Boat (EU Recycling)**

APER Network, France: $1,011.35* ($48.15 / ft.)
*(Does Not Include Transportation Expenses)

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**Questions**

- What level of pricing flexibility exists at shredding stage?
- What is the financial tolerance of Boatyards / Marinas?
- Is a pricing benchmark needed for boats ≥ 15 ft.?
BUILDING ON PHASE 1

The successful validation of fiberglass co-processing provided key lessons:

- **Engagement** of national marine industry stakeholders must continue and expand toward greater participation in long-term development.

- **Legislative support** can implement regulatory change and generate resources that support expansion beyond the Pilot Project stage.

- **Other composite materials** retain similar co-processing values and the RIFVR Pilot Project has generated interest from multiple industries.

- **Geographic variables** draw a clear line between regional opportunities and economic hurdles.
NEXT STEP CHALLENGES

- Synthesizing support within the marine industry

- Bridging the divide between potential partners in other industries
NEXT STEP CHALLENGES

- **Employing transition from pilot project to business model**
  - Centralized facilities and procedures
  - Integration of multiple material types, sources
  - Engagement of manufacturers via rebates or owner incentives
  - RIMTA as facilitator, not operator / logistic coordinator

- **Supporting replication in other states / regions**
  - Puget Sound Fiberglass Vessel Recycling Pilot Project
  - How can other states inform recycling infrastructure
  - Save Our Seas 2.0 (NOAA / EPA)