Understanding Recycling Markets & Practical Tips

NHDES Solid Waste Operator Training
June 2, 2021

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Northeast Resource Recovery Association
Agenda
Part 1

Understanding Recycling Markets

• Intro to Recycling
• Recycling Markets
• Material Specifications
• End Markets

* Break *

• Plastics Case Study – Group Discussion
Agenda
Part 2

Practical Recycling Tips
• Creative Storage Options
• Baling versus Loose
• Tricks of the Trade
• Peer Sharing – Group Discussion
Recycling non-profit that enables communities to manage their own recycling programs.
Cooperative Marketing and Purchasing

- Connect municipalities selling recyclables to companies that purchase recyclables
- Returned $1.8 million to members in 2020
Education

- Meetings, facility tours, annual conference
- Hands on technical assistance
- School recycling programs
Poll: Who’s Here?

What size population is your community? (if seasonal changes, use non-peak population)

*Under 2,500; 2,501 to 5,500; 5,501 to 10,000; over 10,000*
Intro to Recycling

Foundational principles
Conserve Financial Resources

Recycling can help avoid higher cost of municipal solid waste disposal

Though not always true with single and dual stream recycling when markets are down

Costs of landfilling and incineration will continue to rise
Conserve Natural Resources

• Recycling saves energy and natural resources
• Saves valuable landfill capacity for waste that cannot be recycled
Aluminum Example

• Recycling aluminum saves more than 90% of the energy needed to create new aluminum
• Cheaper to recycle than extract more
• Nearly 75% of all aluminum produced is still in use today
When Does Recycling Happen?
Recycling only works when turn materials into new products people use
Source Separated Recycling

Residents separate out recyclables individually at local transfer station
Dual Stream Recycling

Fibers separated from containers
Single Stream Recycling

Containers and fibers all mixed together

Higher cost to “unscramble the egg”

Typically lower value commodities because more contamination
Recycling Markets

China’s National Sword & COVID-19 Impacts
China’s National Sword Policy

• Ban effective Jan. 1, 2018
  – All plastics, unsorted mixed paper & textiles
  – Some glass and metals

• Expanded Jan. 1, 2021 to ban all imported waste
Fibers (cardboard and mixed paper)

• Biggest impact from China’s National Sword
• Pre-Sword, China purchased 55% of world’s scrap paper
Silver Lining

Domestic investment in paper mills

28 new and existing mills increasing capacity for recycled fibers (mostly cardboard)

Source: Northeast Recycling Council (Jan. 2021)
In March 2020, we were all knee deep in COVID-19 concerns.
From a local recycling perspective, two major concerns were:
1) how to safely operate essential recycling facilities in a pandemic
2) uncertain recycling markets and pricing during a pandemic
COVID - More Residential Material

- Residential recycling and trash tonnage way up because everyone home
- Commercial and school waste dropped dramatically
Initial Market Impacts

• Fibers Pricing:
  – Climbed April & May 2020
  – Dropped in June 2020

• Why?
  – Low supply when businesses shut down
  – Then market adjusted when price rose
Current Markets - Fibers

Overall, increased in value compared to a year ago due to decreased supply for businesses and schools.
<table>
<thead>
<tr>
<th></th>
<th>March 2020</th>
<th>March 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRRA Members Marketed</td>
<td>550 tons</td>
<td>775 tons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(UP 225 tons)</td>
</tr>
<tr>
<td>Average Revenue</td>
<td>$57/ton</td>
<td>$96/ton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(UP $39/ton)</td>
</tr>
<tr>
<td>Average Net Revenue for a</td>
<td>$1,300</td>
<td>$2,112</td>
</tr>
<tr>
<td>Tractor Trailer Load</td>
<td></td>
<td>(UP $812/load)</td>
</tr>
<tr>
<td>Net Revenue to Members</td>
<td>$28,904</td>
<td>$71,666</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(UP $42,762 to Members)</td>
</tr>
</tbody>
</table>

**Baled Cardboard**  
*(OCC – Old Corrugated Containers)*
Tuftonboro, NH’s OCC Bales
Current Market Impacts - Aluminum

Can shortage due to massive increase in demand during pandemic
Some increase in revenue, but lower than this time last year
Current Revenue: $.47/lb. for loose; $.63/lb. for baled
Scrap Metal / Light Iron

Current Revenue $155 - $160 gross ton
Glass Recycling

- Limited markets in the Northeast
- Predates China’s National Sword
Challenges with Glass Recycling

- Heavy and therefore expensive to transport (and dispose)
- Ardagh bottling plant closed in MA in 2018
- Contaminants like Pyrex and ceramics detrimental when creating new glass or fiberglass insulation
- Broken glass can create wear and tear on equipment
Single or Dual Stream  
Vendor may provide financial incentive to remove glass
What about Plastics?

Will discuss in depth in case study after the break
March 2020
$149 - $165/ton

March 2021
$91 - $118/ton

57% of NH’s Population and 29% of NH Communities are Single Stream
Single & Dual Stream Communities

- Higher tipping fees than pre-China’s National Sword, but recent improvements
- Additional fees if exceed set contamination limits
- Some switching back to source separation
- Some burned or landfilled recyclables temporarily
Source
Separating Communities

- Less impact from China’s National Sword
- Why? Higher quality commodities and not dependent on materials recovery facilities
- But still impacted by market fluctuations
Material Specifications

Get the most for your commodities
Key words for *all* materials (loose or baled) are:

- Clean
- Dry / Under Cover Storage
- 2 Stage Separation
Two Stage Separation

Sunapee, NH
Cardboard Specs

- CORRUGATED CARDBOARD ONLY
- NO waxed cardboard (will not break down in the mill pulper)
- NO chipboard (as in cereal boxes)
- NO wet-strength (as in soda/beer cartons – have plastic coating)
Lempster NH’s Loose OCC in 40 cubic yard container
North Hampton NH’s OCC Bales
Clean, dry, under cover & use of separators for ease in loading trailers
SAMPLE Spec Question from Lisbon NH
Q: Can pizza boxes be baled with mixed paper?

- Corrugated pizza boxes (the non-greasy part) ok with corrugated cardboard
- Paper pizza boxes (the non-greasy part) ok with mixed paper
- Frozen food pizza boxes (wet-strength) are not recyclable due to plastic coating (please treat as trash just like soda and beer cartons)
Plastics Specs

• Stored under cover (not only for weather but to limit ultraviolet degradation from sunlight)
• Some markets accept cardboard headers; some do not
• Some markets accept 5-gallon water jugs; some do not
Hancock, NH’s #1 PET Bales
Clean, no cardboard headers, under cover
Aluminum Cans

- UBC’s (used beverage containers) ONLY
- NO pet food cans (even if aluminum), steel cans, foil or foil plates
Steel Cans

- Steel cans, pet food cans, empty paint cans, empty aerosol cans and foil/foil plates
- Measured in gross tons (2,240 lbs.) British standard; not net tons (2,000 lbs.) US standard
## Glass Recycling – 3 NRRA Options

<table>
<thead>
<tr>
<th>Material</th>
<th>NRRA Host Sites</th>
<th>End Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Glass (incl. ceramics, porcelain, etc.)</td>
<td>New London, NH Waste Management, Rochester, NH Littleton, NH</td>
<td>Processed glass aggregate (PGA)</td>
</tr>
<tr>
<td>Glass Jars &amp; Bottles ONLY</td>
<td>Lebanon, NH Keene, NH</td>
<td>Glass to glass Fiberglass insulation</td>
</tr>
<tr>
<td>Glass Jars &amp; Bottles ONLY</td>
<td>Dennis, MA – Cape Cod</td>
<td>Processed glass aggregate (PGA)</td>
</tr>
</tbody>
</table>
Glass Recycling

- Glass bottles and jars only
- Canadian vendor cleans and crushes
- Made into fiberglass insulation back in US
- 40 communities in NH, VT & MA
Processed Glass Aggregate

- Glass bottles and jars
- Pyrex, ceramics, porcelain, window glass in NH & VT
- Crush into aggregate
- Subbase for road and infrastructure projects
- 60+ communities in NH, VT & MA
Glass before and after crushing into PGA
Keene, NH NRRA Host Site
Dennis MA – NRRA Host Site on Cape Cod
Meeting the highest spec gives communities the ability to market material to mills and brokers to obtain the most revenue (or least cost) for your recyclables.
End Markets

What happens with your recyclables?
Glass Bottles

New Bottles, New Jars, Fiberglass, Sand used in construction projects

Plastics

Carpet, Backpacks, Polar Fleece, Sleeping Bag and Ski Jacket insulation, Plastic Lumber for Decking and Docks, Play Sets, New Bottles, Buckets, Containers, Frisbees, Stadium Seats
Where does my recycling go?
Through the Looking Glass

A transparent look at glass recycling in New England

Northeast Resource Recovery Association

Glass StoryMap & Video
Destinations

- Most Scrap Metal is shredded, loaded on to barges and currently exported to countries such as India
- Majority of NRRA’s baled cardboard goes “mill-direct” in NH, MA, VT and NY (future ME)
Questions &
Short Break
Case Study

Plastics Recycling
Marketing Material Considerations

- Reputable vendor with environmentally sound practices
- Price – get quotes for best price
- Service – responsiveness for logistics and billing
- Transportation – timely pickup if handled by vendor
- Direct to mill or to a broker
Recycling Equipment
Transportation
Know Your Specs

Does your vendor accept:

- Cardboard headers
- Strapping versus baling wire
- Black plastic
- 5-gallon jugs
- Clamshell packaging (ex. lettuce container)
Types of Plastics

- #1 PET (ex. water and soda bottles)
- #2 HDPE Natural (ex. milk jugs, translucent water bottles)
- #2 HDPE Colored (ex. laundry detergent)
- #3 PVC (ex. plastic tubing)
- #4 LDPE (ex. grocery bags)
- #5 Polypropylene (ex. yogurt containers)
- #6 Polystyrene (aka Styrofoam)
- #7 Other – multiple plastics combined
Chasing Arrows Confusion

- Voluntary system with little to no regulation
- Identifies predominant type of resin in the plastic
- That’s it!
- Doesn’t mean item is recyclable
Plastics Recycling

General Rule:
Greater Separation results in Higher Revenue
Options for Baled Plastics

• #1 PET
• #2 HDPE Natural
• #2 HDPE Mixed Colored
• #2 HDPE “Z” (Natural and Mixed Colored combined)
• #1-7 (containers with lids)
• #3-7 (newest market)
• Rigid Plastics (underutilized market)
#1-7 Mixed

- Responsible end markets with reputable vendor
- Lower value than if separated
- Easier for residents and transfer station staff
- Partial mill direct because make own lumber furniture with #2 natural
- But mechanical problems
Springfield VT’s #1-7 Plastic Bales
#3-7 Mix

- Common bale type from materials recovery facilities
- Buyer recovers #2, #4, #5 and some #7 (primarily want #2 and #4)
- Materials recovery facilities often miss some #1s and #2s when sorting
- Residue to fuel replacement and landfill
#1 PET  
#2 HDPE Natural  
#2 HDPE Colored

- All have stable markets
- Requires three separate storage spaces, then rest usually thrown away
- #5 has value, but not enough volume to separate and store it for market
North Hampton, NH’s #2 HDPE Natural Bales
Z Bales

- #2 HDPE natural and HDPE colored baled together
- Lower value for Z bale than if separate colored from natural
- But easier for residents and saves space
Tuftonboro, NH’s Loose Plastics
## NRRA Monthly Pricing Guide (Excerpt)

### Sample Market Pricing for May 2021

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Revenue / (Cost) Per Ton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Plastic</td>
<td>#2 HDPE Natural (ex. Milk jugs)</td>
<td>$1,560</td>
</tr>
<tr>
<td>Metal</td>
<td>Aluminum Cans</td>
<td>$820</td>
</tr>
<tr>
<td>Plastic</td>
<td>#2 HDPE Colored (ex. Detergent bottles)</td>
<td>$760</td>
</tr>
<tr>
<td>Plastic</td>
<td>Z Bales (#2 HDPE Natural and Colored)</td>
<td>$760</td>
</tr>
<tr>
<td>Plastic</td>
<td>#1 PET (ex. water bottles)</td>
<td>$240</td>
</tr>
<tr>
<td>Fiber</td>
<td>#8 Newsprint</td>
<td>$125</td>
</tr>
<tr>
<td>Fiber</td>
<td>OCC (Cardboard)</td>
<td>$75</td>
</tr>
<tr>
<td>Fiber</td>
<td>Sorted Office Paper</td>
<td>$50</td>
</tr>
<tr>
<td>Plastic</td>
<td>#1 - #7 Mix</td>
<td>$0</td>
</tr>
<tr>
<td>Fibers</td>
<td>Mixed Paper</td>
<td>($25)</td>
</tr>
<tr>
<td>Glass</td>
<td>Into Aggregate or Fiberglass</td>
<td>($75)</td>
</tr>
<tr>
<td>TRASH</td>
<td>MUNICIPAL SOLID WASTE</td>
<td>($120)</td>
</tr>
</tbody>
</table>

(assumes material baled and shipped in full loads)
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Part 2

Practical Recycling Tips
• Creative Storage Options
• Baling versus Loose
• Tricks of the Trade
• Peer Sharing – Group Discussion
Creative Storage Options

Great examples available
Pre-Storage Solutions – Ashland, NH
Pre-Storage Containers – Hancock, NH
Black Plastic Gaylords
Lee, NH Moveable Jersey Barriers
Chester, NH
Ashland, NH Quonset Hut
Storage Containers – Swanzey, NH
Baling Versus Loose

Baled results in higher revenue
Current Cardboard Revenue

- Loose $37.50 - $60/ton
- Baled $105 - $125/ton

- Current value of a 1,000 lb. cardboard bale – $62.50
- Compared to $28.00/bale in March 2020
Mixed Paper

Current pricing:
Loose - $10/ton cost to $55/ton revenue
Baled - $30 to $100/ton revenue
Less wet-strength (soda/beer cartons, frozen food boxes) the lower the cost /higher the value
Newspaper /#8 News

Current revenue:
Loose in gaylords $90 - $100/ton
Baled $140-$150/ton

Newspapers ONLY
(ok to include inserts)

End-use: Insulation
Sorted Office Paper - SOP

Current Revenue:
Loose in gaylords $75 – 80/ton
Baled $100 - $105/ton

White & Colored Office Paper Only
Steel Cans

Baled: Full tractor loads up to $264/gross ton (Canadian market)

Loose: $80 to $90 gross ton (Local markets)
Tricks of the Trade

Lessons learned over the years
Answering Resident Questions

Know your resources
- Refer to transfer station website
- Explain that recycling is local – what happens in another community may not be relevant in your community
- If have an app, like Lebanon, refer to that
- NRRA website or listserv
Gilford NH’s UBC Bales

Number bales to know your inventory at a quick glance
4” x 4” Spacers for ease of loading trailers
Transportation – ready to haul your own material to market?

• New London purchased own trailer for storage and transport of Cardboard Bales to Claremont mill

• New London is now in control of their own destiny
  – No shuffle from storage to trailer in a live load
  – Can haul when want
  – Use of local hauler
  – Haul to local market
  – Better overall pricing
Grantham NH – Hauls rolloff containers to market
Dumping Hoppers – great for 2 stage separation

Bristol, NH
Hillsboro, NH
Salisbury NH – Keeping Material Dry
Steel Cans in with Scrap Metal

- Some communities are putting steel cans in with scrap metal until loose steel can pricing improves*
- Current loose steel can revenue: $80 - $90 gross ton
- Current scrap metal revenue: $155 - $160 gross ton
- *double check with market to make sure acceptable
Flatbed for Plastics

Small western NH community purchased baler for plastics and cardboard

Without loading dock or skid steer (yet), flatbed will be used for loading their first plastics bales to market!
Learn More at www.nrrarecycles.org
Thank You!

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