Changes in the Waste Stream - the Future of the Curbside Material Mix

U.S. EPA SMM Webinar
March 31 2016
Changes in the Waste Stream - the Future of the Curbside Material Mix

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Resource Recycling, Inc.

U.S. EPA SMM Webinar Series

Mar 31 2016
WHAT ARE RECYCLABLES?

- Raw materials
- Compete with other raw materials
- Commodities with fluctuating value
SECONDARY VS. VIRGIN

- Predictability of quantity
- Predictability of quality
EREF STUDY ON PRICE VOLATILITY OF RECYCLABLES

• More volatile than commodities studied
• Paper had the most volatility
SUPPLY & DEMAND

- You don’t sell scrap, someone buys it
- Can’t turn off the spigot anymore
GOALS:

- Aspirational not realistic
- Long-term strategies
- Beware of aggressive reporting
SUMMARY

- Raw materials
- Need a buyer
The Evolution of Materials Use
The Evolution of Materials Use

Source: Chaz Miller, NW&RA
Change in Paper and Packaging in 2012 since 1990

<table>
<thead>
<tr>
<th>Category</th>
<th>% Change from 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>newspaper</td>
<td>-8%</td>
</tr>
<tr>
<td>glass containers</td>
<td>-6%</td>
</tr>
<tr>
<td>steel containers</td>
<td>-4%</td>
</tr>
<tr>
<td>other paper non-durable goods</td>
<td>-2%</td>
</tr>
<tr>
<td>aluminum containers</td>
<td>0%</td>
</tr>
<tr>
<td>HDPE natural bottles</td>
<td>2%</td>
</tr>
<tr>
<td>other plastic containers</td>
<td>4%</td>
</tr>
<tr>
<td>PET bottles and jars</td>
<td>6%</td>
</tr>
<tr>
<td>corrugated containers</td>
<td>8%</td>
</tr>
</tbody>
</table>

PAPER: 2000 - 2013

• 19,140,000 ton loss
• 22% decrease
• Mostly printed paper
• Online shopping
PLASTIC: 2000 - 2013

- 6,960,000 ton gain
- 27% increase
- Packaging is 43%
- Durables on the rise
The Evolution of Packaging
The Evolution of Packaging

Glass bottle, metal cap to PET bottle, PP cap

Glass jars, metal cap to PET jar, PP cap
The Evolution of Packaging

Glass bottle, metal cap to HDPE bottle, PP cap

HDPE Bottle, PP Cap to multi-layer, flexible film pouch
The Evolution of Packaging

- Coffee
- Cookies / Crackers
- Pharma / Over-the-counter
- Baby Food & Formula
- Pet Food
- Shaving
- Nuts
- Personal Care
- Juice

 RESOURCE RECYCLING
Market Drivers Fueling the Shift

• Brand differentiation in an increasingly competitive environment

• Customers preference
  – Convenience is king
  – “On-the-go” lifestyles among increasingly time poor consumers
  – Trend of smaller, single-serving sizes

• Performance is key
  – Highly technical
  – Logistical advantages
  – “Doesn’t matter if it’s sustainable if it doesn’t perform”
EVOLVING TON & MRFS

• Less paper
• More glass
• More plastic
• Lower revenues
• Higher costs
Lightweighting

NWNA Bottle 2005
14.6 Grams

Eco-Shape Bottle 2012
9.2 Grams
What MRFs Have to Do With It
What MRFs Have to Do With It

• MRFs are manufacturing facilities producing a feedstock
• Quality matters
• Single-stream MRFs the standard
• Many designed and built before/for “old” material mix

What’s Going Into the Bale?

- Processing changes & innovations
- Bale specs changing/being developed
- Even in down markets, secondary processors emerging
From Processors to Reclaimers

- ...And from MRFs and PRFs to markets
- Bale yields
- Increased processing costs
Rising Operating Costs

O&M COSTS AT MRFs are UP OVER 20%

SUMMARY

- Input stream is changing
- MRFs are challenged
- How are markets reacting?
MARKETS
The Big Picture

• Strong dollar +
• Excess production of crude and other commodities +
• Changes in China +
• = Down market, disappearing margins, hurting industry
Strong U.S. Dollar

Source: Board of Governors of the Federal Reserve System (US)
research.stlouisfed.org
Low Oil Prices

Crude oil (barrel)

$39.59  -$27.01  -40.56%

At market close  03/24/2016

Excess Capacity

North American Capacity Growth

US containerboard stocks at 11-year high in February but now on seasonal downhill slope -- mills run at 95%

OAKLAND, CA, March 18, 2016 (PPI Pulp & Paper Week) - US corrugated box shipments showed modest growth in February and containerboard inventories dropped by 61,000 tons after their big surge in January.
Changes in China...
It’s Not Just the Green Fence...
China’s Working-Age Population Peaking

Which Has Led to Rising Wages

Source: TradingEconomics.com, 2016
China’s Shifting Labor Landscape

Going from this:
China’s Shifting Labor Landscape
China’s Shifting Labor Landscape

From this:
China’s Shifting Labor Landscape

To this:
China’s Urbanization “Trick”
Which Leads (in Part) To...

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1,161,164</td>
<td>1,173,592</td>
<td>1,007,261</td>
<td>1,088,643</td>
<td>1,012,900</td>
<td>814,012</td>
<td>-20%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>606,635</td>
<td>479,093</td>
<td>433,690</td>
<td>563,208</td>
<td>515,358</td>
<td>562,824</td>
<td>9%</td>
</tr>
<tr>
<td>Canada</td>
<td>145,531</td>
<td>146,196</td>
<td>137,924</td>
<td>177,858</td>
<td>161,225</td>
<td>218,051</td>
<td>35%</td>
</tr>
<tr>
<td>India</td>
<td>72,436</td>
<td>85,342</td>
<td>103,939</td>
<td>86,397</td>
<td>83,023</td>
<td>85,944</td>
<td>4%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>16,002</td>
<td>16,194</td>
<td>26,683</td>
<td>29,361</td>
<td>26,772</td>
<td>48,371</td>
<td>81%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>20,593</td>
<td>23,311</td>
<td>64,404</td>
<td>81,699</td>
<td>75,249</td>
<td>43,602</td>
<td>-42%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>34,936</td>
<td>13,582</td>
<td>22,993</td>
<td>36,076</td>
<td>33,572</td>
<td>42,001</td>
<td>25%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>15,444</td>
<td>23,193</td>
<td>50,889</td>
<td>31,664</td>
<td>29,883</td>
<td>30,653</td>
<td>3%</td>
</tr>
<tr>
<td>Mexico</td>
<td>20,904</td>
<td>24,007</td>
<td>22,041</td>
<td>23,584</td>
<td>21,600</td>
<td>20,211</td>
<td>-6%</td>
</tr>
<tr>
<td>Korea</td>
<td>5,601</td>
<td>5,070</td>
<td>9,979</td>
<td>14,868</td>
<td>13,887</td>
<td>9,591</td>
<td>-31%</td>
</tr>
<tr>
<td>El Salvador</td>
<td>1,268</td>
<td>1,868</td>
<td>2,142</td>
<td>4,591</td>
<td>4,471</td>
<td>6,082</td>
<td>36%</td>
</tr>
<tr>
<td>Thailand</td>
<td>3,194</td>
<td>998</td>
<td>3,740</td>
<td>14,247</td>
<td>12,884</td>
<td>5,091</td>
<td>-61%</td>
</tr>
<tr>
<td>Others</td>
<td>24,169</td>
<td>18,650</td>
<td>23,651</td>
<td>19,493</td>
<td>18,367</td>
<td>21,768</td>
<td>19%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,127,877</strong></td>
<td><strong>2,011,096</strong></td>
<td><strong>1,909,336</strong></td>
<td><strong>2,171,689</strong></td>
<td><strong>2,009,191</strong></td>
<td><strong>1,908,201</strong></td>
<td><strong>-5%</strong></td>
</tr>
</tbody>
</table>

RESOURCE RECYCLING
Which Combined with (Some) Domestic Overcapacity...

2014 U.S. Reclamation Capacity vs Collection

<table>
<thead>
<tr>
<th></th>
<th>Capacity</th>
<th>Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>PET</td>
<td>2,500</td>
<td>1,800</td>
</tr>
<tr>
<td>HDPE Bottles</td>
<td>1,200</td>
<td>1,000</td>
</tr>
<tr>
<td>Non-Bottle Rigid</td>
<td>800</td>
<td>700</td>
</tr>
<tr>
<td>Film</td>
<td>600</td>
<td>500</td>
</tr>
</tbody>
</table>

Millions of Pounds
Aggregate Scrap Material Values

ISRI Index: Jan 2008 - Dec 2015

(Jan 1998 = 100)

Source: Institute of Scrap Recycling Industries, 2016
Value of a Commingled Ton

Source: Scott Mouw, NC DNER, 2016
OIL PRICES & RECYCLABLES: RECOMMUNITY

ACR vs Oil Prices

Average ACR = $108

Oil futures suggest slow commodity price growth

$66\textsuperscript{1}

$64

$46 - $48

7.5\% CAGR


$180

$160

$140

$120

$100

$80

$60

$40

$20

$0
SUMMARY

• Recyclables are raw materials that need buyers
• The raw material mix is changing
• Buyers face limits in what they can pay
RECYCLING IS NOT FREE

• Additional charge on monthly bills
• People know that recycling is not free
CONTRACT SMARTER

• “Joint Advisory on Designing Contracts for Processing of Municipal Recyclables”
• NWRA & SWANA
CONTRACT PROVISIONS

- Clear definitions
- Contamination levels
- Residue levels
- Processing fees
- Revenue sharing
- Input audits
- Education
• Handling Fee for fully rejected load which the customer removes?
• Add disposal fee if the customer does not remove?
• Handling Fee for excess contaminated single stream?
• Downgrade contaminated OCC from commercial sources?
CLOSING THOUGHTS

• Unusual challenges
• Don’t have all the answers
Some Good News...

- SE Asian markets growing
- Markets cyclical
- Low oil also means fuel savings
- Ample domestic capacity, esp. plastic
- Innovations abound
- Acting local…
Thank You!

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Save the Date for the Resource Recycling Conference Aug 30-Sept. 1 in New Orleans
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