Evolving Recycling Systems and Strategies

The Effect on State Recycling Goals

2016 SC SWANA Spring Conference

Amanda Fairley
Sustainability Manager South Atlantic
Waste Management

May 19, 2016
WASTE MANAGEMENT IN SUMMARY

Waste Management, Inc. (NYSE: WM), based in Houston, Texas, is the leading provider of comprehensive waste management and environmental services in North America.

- Creates enough energy to power more than 1.1M homes every year
- Manages over 15 million tons of recyclable commodities
- Dedicates over 27,000 protected acres to wildlife habitats

- 262 active solid waste landfills
- 5 active hazardous waste landfills
- 17 waste-to-energy plants
- 58 natural gas fueling stations, 27 also serve the public
- 137 landfill-gas-to-energy projects
- 1 active hazardous waste underground injection facility
- 18 secondary processing facilities
- 36 organic processing facilities
- 36 transfer facilities
- 120 traditional recycling facilities, 50 are Single Stream and 12 are C&D recycling facilities

- +21 million customers
- +42K employees
- +390 collection operations
- +42K capital expenditures
- 1.3B free cash flow
- 922M returned to shareholders
- 14.0B in revenue
Disposal and recycling in the US: 1980 to 2013

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Waste generation/ person/ day</td>
<td>3.66</td>
<td>4.57</td>
<td>4.74</td>
<td>4.69</td>
<td>4.40</td>
<td>4.40</td>
</tr>
</tbody>
</table>

We are generating less waste per person as the waste stream changes.
### What’s in the Waste Stream?

#### US EPA Facts and Figures - 2013

<table>
<thead>
<tr>
<th>Materials generated</th>
<th>Percent of MSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper, paperboard and packaging</td>
<td>22%</td>
</tr>
<tr>
<td>Containers</td>
<td>16%</td>
</tr>
<tr>
<td>Food</td>
<td>14.6%</td>
</tr>
<tr>
<td>Yard waste</td>
<td>13.5%</td>
</tr>
<tr>
<td>Durable goods (furniture, textiles, carpet)</td>
<td>20.3%</td>
</tr>
<tr>
<td>Other (non recyclable products, plastics and other materials)</td>
<td>13.6%</td>
</tr>
</tbody>
</table>

* Nondurable goods are newspaper, mechanical papers

Traditional recyclables make up about 38% of the waste stream, while yardwaste and foodwaste make up another 28% for a total of 66% of the waste stream served in curbside recycling programs.
Change in Paper and Packaging: 1990-2012

% Change from 1990

Declining prevalence
-8%
-6%
-4%
-2%
0%
2%
4%
6%

Increasing prevalence

Courtesy: RRS

©2015 Waste Management
The Evolution of Materials Use

Newsprint Shipments

2000: 15.8 (peak)
2005: 12.7
2010: 7.8
2011: 7.3
2012: 6.7
2013: 6.4

50% decline
The evolving package

- Glass jars, metal cap to PET jar, PP cap
- Light-weighting
- Flexible packaging expected to grow 4-6.5% annually in the next few years

From steel can, paper label adhesive to multi-layer, foil-lined flexible film pouch

HDPE Bottle, PP Cap to multi-layer, flexible film pouch
A Packaging Evolution
The Role of Life Cycle Thinking
Why product/packaging design is important

Courtesy: American Chemistry Council

©2015 Waste Management
The Millennials are coming - what should we expect?

- Millennials are defined by the group of young adults between 19-27 in 2015. They number 79 million this year, making them a larger demographic group than Baby Boomers (76 M). They are just starting to have children and to reach their peak purchasing years.

- Millennials are not beholden to traditional packaging. Cans, jars and bottles do not always fit with their lifestyle.

- They are more likely to eat convenience food, food on the go, and 17% more likely to purchase food from convenience stores and one-stop-shop mass merchandisers than traditional grocery stores.

  Millennials want meals they can prepare and eat quickly, with little or no cleanup - and minimal leftovers.

  The average Millennial eats nearly one-third few meals per year involving leftovers than adults in their late 30’s and 40’s.

  *Brand Aptitude, 2012*
Consumer Behaviors: On-the-Go Examples

- **Pharma / Over-the-counter**: Pepto-Bismol, TYLENOL, Gerber Organics
- **Coffee**: Starbucks VIA, Similac Go
- **Baby Food & Formula**: Gerber Organics, Enfamil
- **Cookies / Crackers**: RITZ, Multi OREO
- **Shaving**: Personal Care items like shaving cream
- **Pet Food**: Pet Food items
- **Nuts**: Planters Salted Peanuts
- **Juice**: Capri-Sun, Minute Maid
- **Baby Food & Formula**: Gerber, Enfamil
- **Coffee**: Starbucks VIA
- **Shaving**: Personal Care items like shaving cream
- **Pet Food**: Pet Food items
- **Nuts**: Planters Salted Peanuts
- **Juice**: Capri-Sun, Minute Maid
- **Personal Care**: Various personal care products
Implications

• Less food waste
• More custom packaging
• More small packaging
• More packaging that cannot be recycled in MRFs with existing technology
• More packaging with no end markets
• Convenience trumps sustainability

ON THE GO PACKAGING: Fresh Fruits & Vegetables
What Makes Something Recyclable?

All of these are necessary for sustainable recycling:

- Convenience
- Size/shape
- Public education

Collection
- Identification
- Sorting
- Size

Processing
- Demand
- Volume
- Value

End-Market

©2015 Waste Management
MRFs in 2015

- MRFs are not well matched to current materials/flows. Singles stream MRFs were built to process the mix of recyclables processed in the 1990s.
- Inbound material at MRFs is now around 60% paper and 40% containers.
- The volume in a ton has increased as packaging has become lighter.
- Glass and residue is a greater percentage of our recycling mix than other commodities with value.

These all have implications on the design of MRFs, and increase the cost of recycling. If we design new MRF’s for today’s waste stream - where will we be in 2020 as the waste stream changes?
Increasing contamination

Contamination of loads is an average of 16% of inbound tons.

Contamination can be up to 50% of incoming loads

Contamination cost an average of over $125 per ton

Processing costs continue to increase as markets demand reduced contamination. This drives up cost to customers.
How do we drive down contamination?

- Improve quality and quantity of recyclables collected
- Reduce contamination of inbound recyclables
- Utilize a data-driven approach to recycling education
- Change consumer recycling behavior using clear, specific action items and messages
Simple Messages

1. Recycle all my empty bottles, cans and paper.
2. Keep food and liquids out of my recycling.

Simplifying the Message

- Focus on 3 simple behaviors that could greatly impact recycling
- Tested and proven approach
- Accompanying myth busters/FAQs for those who want to dig deeper
ACR in relationship to Oil Prices

ACR vs Oil Prices

Average ACR = $108

Oil futures suggest slow commodity price growth

$66  $46 - $48

7.5% CAGR

$64
Value of a Commingled ton

Source: North Carolina DNER
What does this mean for recycling?

• The changing waste stream has increased the cost of recycling
• There are more non-recyclable materials in the feedstock - which increases the cost of recycling programs
• There are more low-value materials in the recycling stream, which reduces overall commodity revenue.
• A lighter recycling stream makes it harder to increase recycling rates

A recent NPR story highlights some of recycling’s current challenges associated with the global economic conditions, the changing waste stream & contamination: https://thedianerehmshow.org/audio/#/shows/2015-07-07/new-challenges-to-recycling-in-the-united-states/110575/@00:00
The Art of Anticipating Change

• How do we anticipate change?
• How do we design for change?
• What should we measure success?
• If we build future plants to handle current streams, what will we miss?

MRFs see changes in packaging and consumer trends when the materials showed up at their facilities. The challenge will be to anticipate changes and build flexibility into infrastructure design.
Evolution of Products
Questions?

Thank you.