PET Thermoform Recycling: Current Markets & Outlook

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Presentation Outline

- Overview
  - Introduction to NAPCOR
  - Context: The PET Supply Problem
  - New Sources: Thermoform Recycling

- NAPCOR Thermoform Recycling Program
  - Canadian Grocer’s Initiative
  - NAPCOR/SPI Grant Program

- US Market Status

- Moving Forward
Introduction to NAPCOR?

- NAPCOR is the trade association for the PET packaging industry in the United States and Canada.
- 47 members encompass all parts of the PET value chain from resin production to end of life/recycling.
- NAPCOR’s priorities are to:
  - Promote the introduction and use of PET packaging
  - Facilitate PET recycling
  - Communicate the attributes of the PET container as an environmentally sustainable package.
NAPCOR Membership 2013

**PET Container Manufacturers**
- Amcor Rigid Plastics
- Nestle Waters of N. America
- Plastipak Packaging, Inc.
- Yoshino America Corporation

**PET Resin Manufacturers**
- DAK Americas LLC
- Indorama Ventures USA Inc
- Selenis Canada

**PET Sheet / Thermoformers**
- Dart Container Corp.
- Direct Pack, Inc.
- Earthbound Farm
- Fabri-Kal
- Genpak LLC
- Global PET
- Nu-B, Inc.
- Par-Pak, Ltd.
- Peninsula Packaging Company
- Plastic Ingenuity, Inc
- Sabert Corporation

**PET Industry Suppliers**
- Avery Dennison
- BP
- Buhler
- CarbonLite Industries
- Clear Path Recycling
- ColorMatrix
- Custom Polymers PET
- Erema North America
- Evergreen Plastics
- Husky Injection Molding
- KHS USA
- Krones
- MHT USA
- Marglen Industries
- Muehlstein
- Mohawk Industries
- Peninsula Plastics Recycling
- Perpetual Recycling Solutions
- Plastrec
- Polyquest, Inc.
- Reterra
- Sidel
- Signode
- Sorema Plastic Recycling
- Starlinger and Co.
- TOMRA No. America
- UltrePet LLC
- Uniform Color Company
Context: PET Recycling & Utilization Rates

The chart shows the PET Recycling Rate and PET Utilization Rate from 2001 to 2011. The rates have been increasing over the years, indicating a growing trend in recycling and utilization of PET materials.
## Context: Demand for rPET Content & Reclamation Capacity Exceeds Supply

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Plants in the US</th>
<th>Reclamation Capacity (Billion Lbs)</th>
<th>Clean Flake from US PET Bottles Collected* (MMLbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>18</td>
<td>1.247</td>
<td>1.078</td>
</tr>
<tr>
<td>2010</td>
<td>19</td>
<td>1.465</td>
<td>1.115</td>
</tr>
<tr>
<td>2011</td>
<td>23</td>
<td>1.755</td>
<td>1.052</td>
</tr>
</tbody>
</table>

*Includes bottles currently exported
What are thermoformed packages?

- Cups, clamshells, trays, tubs, boxes, lids, egg cartons and similar packages made from plastic sheet

- Can be PET, OPS, PETG, PP, PVC, PLA, etc.

- Growing package
  - 20% of PET packaging generated in North America 2011
  - >15% growth rate projected
Overview: Thermoform Recycling

Thermoform Uses – All Resins

- Food Service
- Grocery Retail
- Non-Grocery Retail
- Medical/Other
NAPCOR PET Thermoform Recycling Program Objectives

- Identify and remove the obstacles throughout the system (collection to end use) that prevent PET thermoformed packaging from being recycled
- Recycle thermoforms without harming PET bottle reclaiming infrastructure
- Increase the availability of post consumer RPET
NAPCOR PET Thermoform Recycling Program Plan

- Laboratory research
  - Identify technical issues that would impede or prevent PET thermoform recycling as a dedicated stream, or with bottles

- Field trials
  - Work with collectors and processors to move truckload quantities through operating systems to identify and remedy technical, mechanical and logistical issues

- Partnerships wherever possible
Obstacles to PET Thermoform Recycling...

- Look-alike containers made from other resins
- Non-recycling friendly adhesives
- Fluorescing packages
- Variable IVs
- Mechanical engineering issues
Key Partnership: Canadian Grocers Initiative

- Loblaw; Sobeys; Walmart; Metro; Safeway (under Retail Council of Canada organizational umbrella)

- Conversion out of unrecyclable packaging

- Conversion to PET of all in-store and private label, followed by those products that are shipped in thermoforms

- Adoption of APR compatibility protocol and encouraged supplier adherence, [http://plasticsrecycling.org/pet-thermoforms](http://plasticsrecycling.org/pet-thermoforms)
NAPCOR / SPI Grant Program

NAPCOR/SPI funding supplemented by Placon, Plastic Ingenuity & Solo Cup to fund three programs. Test various education messages, collection strategies and processing approaches.

- Montgomery County, MD
  - Curbside collection, manual sorting

- Elk & Lebanon Counties (PA)
  - Rural drop off, separated

- Omaha, NE
  - Special events & venues
NEW Program Begins October 1st
Clear PET Thermoform Recycling
at the GLRA's Recycling Drop-off Center
at 1610 Russell Road

Clear PET Thermoform Packaging Items are now being accepted in a separate container located at the Greater Lebanon Refuse Authority Recycling Drop-Off Center.

What are Clear PET Thermoforms?
Any clear or translucent packaging with a #1 PET plastic resin code. This includes, but is not limited to, clamshells, cups, trays, tubs, lids and clear plastic vacuum pouches.
SPI / NAPCOR Grant: Firstar Fiber

- Working on recycling partnership with Univ. of Nebraska, Omaha
- Planning more social media, e.g., Facebook contest

Halloween family event at Omaha zoo, Oct 26 -28
Recycle More Now!

It's easy! Just place your recyclable materials in the correct containers.

We accept these plastic item types:

<table>
<thead>
<tr>
<th>Resin numbers</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 3, 4, 5, 7</td>
<td>Plastic bottles that contained food, drink and household products, medicine and vitamin bottles</td>
</tr>
<tr>
<td>1, 2, 3, 4, 5, 7 (except items marked biodegradable or compostable)</td>
<td>Mayonnaise, peanut butter, yogurt, cream cheese and butter containers; deli and ice cream tubs; yogurt cups; medicine vials; detergent; pet food and kitty litter containers; #1 PET thermoform plastics including: clamshell containers, bakery trays and cake domes, deli containers and trays, fruit and vegetable containers and baskets, cups, tubs and lids</td>
</tr>
</tbody>
</table>
Current MRF Market Options

- Obstacles have been, or are being, addressed

- Significant concerns remain
  - Look alike packaging; labels/adhesives/inks

- Domestic market acceptance varies
  - Some reclaimers are processing mixed bottle/ thermoform bales (market-specified, percentages ranging from 5-30%)
  - Some reclaimers are accepting PET thermoform-only bales
  - 2 PRFs in North America sort mixed rigid bales and market PET domestically

Protect your bale quality & talk to your buyer!
Overview: Thermoform Packaging Recycling

Thermoforms (PET) ➔ Intermediate processor/MRF ➔ Thermoform bales ➔ Domestic reclaimer

Thermoforms (other resins) ➔ Intermediate processor/MRF ➔ Bottles & thermoforms ➔ PRF (2 in NA)

Mixed rigid bales ➔ Export ➔ Domestic end markets
PET Thermoforms in Bottle Bales are Increasing

% Thermoforms by Weight, Curbside/Drop-off Bales

Source: NAPCOR commissioned bale analyses, conducted by Moore Recycling Associates
PET Thermoform Recycling and GHG Emissions Avoided

Recycling compared to landfilling. Source: EPA WARM Model v.12
Moving Forward

- Investment in plants and technology capable of efficiently processing PET thermoforms is accelerating
  - Successfully being recycled in fiber, sheet and bottle applications

- Efficient MRF processing = include thermoforms with bottles
  - Must protect bale quality
  - Look alike packaging and other design for recyclability issues must be addressed
Reality Check

- For plastic packaging, there is NO sustainability without recycling!
- There is no post consumer plastic recycling without public policy!
- There is no such thing, environmentally, as a polymer so good it can just be thrown out!
Thank you!

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