Plastics Market: Collecting for Value

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More Recycling is the Next Generation of Moore Recycling Associates

- Have nearly 20 years of research and consulting experience in the recycling of postconsumer materials, specifically plastics.
- Offer a deep understanding of the complex and ever-changing lifecycle of plastic packaging
- Serve as a liaison between industry, public agencies, and NGOs and prioritize accurate information and neutrality in the marketplace.
Overview

Introduction & Value Chain

Why Quality Pays:
Market Drivers & Influences
Specific Commodities

How to Collect for Quality:
Clear Terminology
Dealing with Plastic Film

Resources
Recycling is a Business

Like all manufacturing, Plastic Recycling must...

- Have available raw material
- Attract investment
- Innovate
- Make profitable products
- Collection Quality
- Adequate reclamation capacity
- Sufficient end market

Source: Dave Cornell
Considerations

Know your Material

- Not all Plastic Plastics are Created Equal
- Readily Recyclable vs. Not
- Contaminants
- Post Industrial
- Post Commercial
- Post Consumer

Know your Market

- Demand
- Direct vs. Broker
- Specs
- Price Influences
- END USER IS KEY
The Evolution of Packaging

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

Source: Dylan de Thomas
Plastic Film Value Chain

Collection
Consolidation
Reclamation
End Use
Collection

Examples: Haulers, Retailers, Institutions
Consolidation

Examples: Brokers, MRFs, Distributors, Scrap Dealers
Reclamation

Examples: Pellets & End Products
End Markets

Examples: Bottles, Pipe, Bags & Sheeting, Composite Lumber
Plastics Market Drivers

- General economic conditions
- Price of natural gas, petroleum & derivatives
- Virgin resin production capacity relative to demand
- Industrial scrap & off-spec supplies
- Supply and demand of recycled feedstock
  - Goals for recycled content
Current Economic Conditions

- Strong Dollar
- Excess Production of Crude & Other Commodities
- Changes in China/Asia
- Increased Processing Costs

Down Market
Tight Margins
Industry Pains/Constraints

Quality sells
Domestic vs Export Data

U.S. Postconsumer Plastic Recycling
in millions of pounds

- PET Bottles
- HDPE Bottles
- Non-bottle Rigid
- Film

![Graph showing U.S. Postconsumer Plastic Recycling from 2009 to 2015, comparing export and domestic data for different categories of plastic recycling.](image-url)
Plastic Scrap Price vs Oil

Scrap Price History vs Oil: 2007 to-date

$/lb of plastic scrap: Moore Recycling - FASCA Ports

Barrel of crude oil: EIA - Cushing, OK
Specific Commodities

PET Bottles & Thermoforms
HDPE Bottles
Non-Bottle Rigids
Polypropylene Bottles & Containers
Polystyrene
Bags & Film
PET Recycling

- Recycling Rate: 30.1%*
- Lightweighting affects yields
- Bale yield mid-60% to mid-70%
- Flattening bottle demand
- Lower PCR demand
- Virgin resin capacity

*2015 data
PET Thermoform Challenges

- Intrinsic property differences
- Aggressive labels
- Sorting difficulties
- Black plastic
- Not all haulers/MRFs/reclaimers want them
PET Bottle* Movement

PET Materials Flows in the US

http://www.napcor.com/PET/pet_reports.html

Promoting and Protecting the PET Package
HDPE Bottles

- Recycling Rate 34.6% in 2015
- Right-sizing of bottles
- Bale yield at nearly 82%

End uses of HDPE bottles

HDPE 2015 U.S. Reclamation Capacity vs Collection

- Non Food Bottles, 35%
- Pipe, 35%
- Film/Sheet, 7%
- Lawn/Garden, 4%
- Pallets, 0.3%
- Crates/Buckets, 1%
- Lumber, Decking, 5%
- Other, 3%
- Automotive, 9%
Non-Bottle Rigs

U.S. Non-Bottle Rigid Plastic Recovered Year to Year by Resin² (pounds)

- PET
- HDPE
- PP
- LDPE
- PS
- PVC
- Other/Mixed

MORE™ RECYCLING
Polypropylene

- Recycling rate is growing for both bottles and containers/caps
- Opportunity to expand collection?
- Demand for material continues to grow
- PRFs/Secondary MRFs support growth of processing

2014 Sources of Non-Bottle Plastics

- PP: 38.3%
- HDPE: 34.1%
- PET: 11.8%
- Other: 11.9%
- LDPE: 0.9%
- PS: 1.8%
- PVC: 1.3%
Polypropylene Map

Polystyrene

- Domestic Markets exist
- Densification is essential
- Easily identifiable
- Grants available from Foodservice Packaging Institute
Polystyrene

Case Studies and Map available: www.RecycleMorePlastic.org
Plastic Film Scrap Prices
Collect For Value

Clear Terminology

“Return to Retail” Message for Film and Bags
Plastics Recycling Terms

Better Terminology

Residents

Communities

MRFs

Markets

Less Confusion

More Plastics Collected

More Successful Plastics Recycling

Better Terminology = Better Recycling
The Terms and Tools

**Goal:** Increase the quality and quantity of plastics collected and to facilitate better tracking.

**Outreach Terms:** Common terminology and simple tools for community recycling programs in the US and Canada to help these programs communicate more effectively to residents about plastic recycling.

**Commodity Terms:** Streamline communications about buying and selling plastics that have been collected in the plastics value chain.
Quality and Quantity: The Local Challenge

People are confused and overwhelmed.

Plastics 1-7: Can I recycle everything plastic?!?

I don’t get it, so forget it!

OR: I’m not sure, but I’ll put it in anyway.

Need meaningful terms that effectively communicate

But, what about these?
A Solution:

Outreach Terms:
4 easy steps to build your program with Images and Tool to build program flyer.

RecycleYourPlastics.org
Definitions

Categories are defined for easy usage.

**Plastic Soda, Water & Other Drink Bottles**
Soda, water, juice and other beverages – Commonly marked: PET (1), HDPE (2), PP (5), Other (7)

**Plastic Food & Household Bottles/Jars**
Screw top bottles/jars - For Example: Food: ketchup, peanut butter, mayonnaise, mustard, Household: laundry detergent, shampoo, and cleaning products – Commonly marked: PET (1), HDPE (2), LDPE (4), PP (5), Other (7)

**Plastic Tubs**
Tub containers, such as: yogurt, margarine, ice cream tubs, coffee containers. Commonly marked: HDPE (2), LDPE (4), PP (5)

**Plastic Tubs & Lids**
Tub containers and lids for items such as: yogurt, margarine, ice cream tubs, coffee containers – Commonly marked: HDPE (2), LDPE (4), PP (5)

**Plastic Produce, Deli & Bakery Containers, Cups, Trays**
Take-out, deli, bakery, berries/produce containers, cookie trays, cake domes, party cups, clear egg cartons – Commonly marked: PET (1), PP (5), PS (6), Other (7)

**Plastic Non-food Containers & Packaging**
Containers and packaging for non-food items such as: flower pots, small storage containers like tupperware, CD/DVD cases, clear formed plastic packaging around products like toys or hardware and electronics (paper components should be removed) – Commonly marked: PET(1), HDPE (2), LDPE (4), PP (5), PS (6), Other (7)

**Plastic Bulky Items**
Items as large as or larger than a 5 gallon bucket, such as: drums, large water bottles, crates, large storage bins, baskets, totes and lawn furniture – some may be marked: PET (1), HDPE (2), LDPE (4), PP (5), Other (7)

**Plastic Toys**
Plastic Toys without metal or electronic components. For Example: Slides, play kitchen, sand bucket and shovel, flying disk, bat & ball

**Plastic Buckets**
5 gallon buckets, kitty litter buckets – Commonly marked: HDPE (2), PP (5)

**Plastic Flower Pots**
Rigid flower pots. 4 inches or larger – Commonly marked: HDPE (2), PP (5)

**Plastic PET (1) Bottles & Jars**
Screw top bottles/jars that are marked PET (1) - For Example: Beverage - soda, juice, water and other beverages, Food - ketchup, peanut butter, mayonnaise, mustard, Household - shampoo, cleaning products

**Plastic PET (1) Containers & Lids**
Take-out and other containers, lids, cake domes and trays used to package items such as fresh produce, baked goods, nuts, and deli items; and clear cups that are marked PET (1)
Create Your Own Flyer

- Pulls in
  - Program selections
  - Image selections

- Add
  - Logo
  - Community info
  - Contact info

Please Recycle:
Plastic Bottles & Containers
- Plastic Soda, Water & Other Drink Bottles
- Plastic Food & Household Bottles/Jars
- Plastic Tub & Lids
- Plastic Produce, Deli & Bakery Containers, Cups, Trays
- Plastic Non-food Containers & Packaging

Plastic Buckets

Oh and by the way...
* Empty, flatten and put caps back on bottles/jars
* Rinse or wipe clean all food or other residue from bottles & containers

Exclusions:
No Containers that held Hazardous Products
No Bags, Wrap or Film Plastic
No Foam

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Image Gallery

- Royalty-free
- Acceptable items and exclusions
- Provided in JPEG, TIFF, and EPS
- EPS allows for easy layering
Commodity Terms: Communications with MRFs and Markets

Communicating WHAT IS IN THE BALE

What am I buying?

MRF Sorting to market

What are we diverting?

Municipality Trying to divert material

Better Tracking More Understanding More Value

Consumer Put in the bin

Markets Recycling into a useable raw material
Why Use the Commodity Terms?

“Waste Management recognizes the importance of communicating with one voice - to communities and their residents about what to put in the bin, and with markets about what is being sold. Common terminology helps us achieve that goal.”

Susan Robinson, Sr Public Affairs Director, Waste Management
Better Tracking:
Consistent Terms = Consistent Data
Better Tracking: Critical Plastics Data

Availability of Recycling (PP Tubs & Containers)

Bale Audits & MRF Studies
Better Tracking: Critical Plastics Data

U.S. Postconsumer Plastic Recycling
in millions of pounds

Sources for Non-Bottle Rigid Plastic

Annual Plastic Recycling Reports
Find and USE the Terms & Tools

www.RecycleYourPlastics.org/termsandtools
www.RecycleYourPlastics.org/commodityterms
Bags & Film

• “Return to Retail:” Discourage curbside collection

• More than 18,000 drop off locations

• Many opportunities to improve commercial collection

• Growing use of How2Recycle Label
Historical Film Scrap Price

- Mixed Film
- Curbside Film
- Commercial Film
- Clean Ag Film
- Dirty Ag Film
Retail Collection vs. Curbside

**Pro:** Retail collection keeps material clean, dry, and *valuable* for end markets

**Pro:** Takes advantage of existing, efficient infrastructure

**Con:** Have to take material elsewhere; easier to put in trash or bin anyway?

**Pro:** Curbside collection is easy for consumers

**Con:** Problematic for MRFs—reducing efficiency for ALL commodities

**Con:** Generally too dirty for domestic processing and very expensive to clean.

Final- Quality pays; use of existing infrastructure improves efficiency

Final- No markets currently to justify extra cost of washing/handling to recycle this material.
RECYCLE clean & dry bags & wraps HERE

NOT in Curbside Recycling

Also look for any packaging with this How2Recycle label

NO candy bar wrappers, chip bags, six-pack rings or degradable bags

PlasticFilmRecycling.org
US Retail/Drop-offs Locations
WRAP can Help

• Provide alternative solutions for film and bags—NOT curbside bins/MRFs
• Maximize material quality—for film and other commodities
• Protect local environment
• Support your sustainability goals
What is WRAP?

Wrap Recycling Action Program (WRAP)

*Free and Voluntary* public education & outreach initiative, led by the Flexible Film Recycling Group (FFRG).

- Seeks to engage motivated partners *nationwide*

**Goal:** Double film recycling by 2020 through *return to retail and drop off collection and greater commercial access.*

**Objectives:**
- Dramatically increase film recycling by:
  - Forging partnerships with key allies/stakeholders
  - Providing essential educational tools & programs
  - Gather data to improve tools and information
Putting the Pieces Together

Demand: PCR Use
Collection: Curbside, Drop off, Special
Design Guidelines
Policy & Infrastructure
Commercial Access
Bale Specs

- ISRI
- APR
- Individual Buyers
- Work to streamline grades, types, and language

Plastic Terms & Tools

- Knowing what your buyers want is the most important spec

Mixed Bulky Rigid Plastics
This grade primarily consists of non-bottle PE and PP bulky rigid plastic items such as plastic drums, crates, buckets, baskets, toys, refuse totes, and lawn furniture typically collected in a residential recycling MRF. This grade should not contain any mixed 1-7 bottles and containers.

Product: Mixed household items
Source: Postconsumer material
Contamination: Total allowed—2% listed below
- Non-specified plastic or non-plastic material

General: Refer to the General Information section for more information.

Mixed Color HDPE Buckets
Shall consist of HDPE buckets and "pail-grade" 5-8 melt-injection-grade HDPE recovered from any residential, construction, or commercial application. Original product such as paint or food must be emptied from unit, but dry surface residue is allowed. Metal handles are acceptable. Standard bale will include white or other colored 5-gallon buckets.

Product: Buckets recovered from a sorting facility
Source: Residential and commercial materials
Contamination: Total allowed—5% listed below
- Other types of HDPE containers or bottles
- Large rigid plastics such as drums, toys, lawn furniture, etc.
- Non-specified plastic or nonplastic material such as metal, paper, or glass

General: Refer to the General Information section for more information.

Mixed Color HMW HDPE Drums
Shall consist of high-molecular-weight HDPE drums or barrels recovered from any commercial application. Original product such as solvents or chemicals must be emptied from the unit, and the unit must be rinsed in accordance with federal and state regulations prior to baling. Plastic lids and spouts are acceptable. Standard bale will include blue, white, or other colored 55-gallon drums.

Product: Commercial materials
Source: Commercial materials
Contamination: Total allowed—2% listed below
- Other types of HDPE containers or bottles
- Large rigid plastics such as drums, buckets, pails, toys, lawn furniture, etc.
- Non-specified plastic or nonplastic material such as metal, paper, or glass

General: Refer to the General Information section for more information.

Tubs and Lids Without Bulky
Description: Any whole container with a N2 HDPE, N5 PP, and/or N4 LDPE resin code generated from a positive-sort curbside, drop off, or other public or private recycling collection program. Tubs are containers that have a neck or mouth similar in size to its base. Lids are caps for tubs that have a fastening feature other than threads. Examples include yogurt cups, margarine tubs, ice cream tubs, and cold drink cups (transparent, cold serve). Nursery pots are not acceptable.

Bulky rigid plastics are not allowed.
Product: Tubs and lids.
Source: Postconsumer material generated from a curbside, drop off, or other public or private recycling collection program.
Contamination: Total allowed—0% by weight.
- #1 PET bottles
- #1 PET or #3 PVC thermoform packaging
- #2 HDPE pails and buckets
- #3 PVC (polystyrene)
- #4 PS (polystyrene)
- #7 Other
- Paper
- Liquids

General: Refer to the General Information section for more information.

Tubs and Lids With Bulky
Description: Any whole container with a N2 HDPE, N5 PP, and/or N4 LDPE resin code generated from a positive-sort curbside, drop off, or other public or private recycling collection program. Tubs are containers that have a neck or mouth similar in size to its base. Lids are caps for tubs that have a fastening feature other than threads. Examples include yogurt cups, margarine tubs, ice cream tubs, and cold drink cups (transparent, cold serve). Nursery pots are not acceptable.

Bulky rigid plastics are allowed.
Product: Tubs and lids.
Source: Postconsumer material generated from a curbside, drop off, or other public or private recycling collection program.
Contamination: Total allowed—0% by weight.
- #1 PET bottles
- #1 PET or #3 PVC thermoform packaging
- #2 HDPE pails and buckets
- #3 PVC (polystyrene)
- #4 PS (polystyrene)
- #7 Other
- Paper
- Liquids

General: Refer to the General Information section for more information.
Directories

http://www.plasticfilmrecycling.org/s04/s04_getlisted.html

www.plasticsmarkets.org/recycle/viewsearch.html

http://www.plasticfilmrecycling.org/plasticbag/s11_pcrdirectory.html
Tools

Warehousing and Distribution
(For the Retail Sector)

Thank you for your interest in setting up a plastic film recycling program.

Many retail locations are shipped to distributors and retailers wrapped with plastic. Plastic wrap protects them from contamination, theft, dusting, and exposure to weather and moisture, and protects merchandise.

Why Recycle Plastic Wrap?
Businesses use about 14 billion pieces of plastic wrap per year. There are significant benefits of recycling plastic wrap. First, plastic wrap is a non-recyclable material. Therefore, a well-designed program to collect and separate plastics and plastics will help generate revenue and reduce waste disposal costs.

To explain the cost benefit of recycling, rethink the consequences of disposing plastics:

WHAT IS IT USED FOR?

Bottles for beverages (e.g., milk, water, juice and soda), foods (e.g., peanut butter, ketchup, mustard, mayonnaise), household detergents, and toiletries (e.g., shampoo, body wash, mouthwash, lotion, medicine). Containers for yogurt, cheese and deli and dairy products. And caps and lids.

WHY IT WANTS TO BE RECYCLED.

Used plastics are valuable resources, versatile and adaptable to many uses. There is a wide market for your recycled plastic bottles and containers. Recycling your plastics helps keep valuable materials out of landfills and helps reduce energy use and emissions.

Recycling Rigid Plastics Beyond Bottles: CONTAINERS

The Association of Plastic Recyclers

Marketable Material, Growing Demand
Value Chain Case Study

• COMING SOON!

• Resource for all parts of the Recycling Value Chain

• Case studies, reports, tools

• Highlights recycling successes

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Expanding the Value Chain Case Study

Plastic Recycling Value Chain Case Study

Explore how plastic film gets recycled

View any number of key aspects of the ecosystem.

End Use

Explore great brands

Reclamation

Explore recycling highlights

consolidation

Learn more

Education & Collection

Discover best practices

Material Recovery Facility

Recycling at Home & Work

Why shouldn’t plastic bags and film be recycled in your curbside bin? What makes this material valuable to recyclers and manufacturers? And how can we as people and producers sort, collect, and retain value at each integral point in the plastic film recycling ecosystem?

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Reclamation

End Use

The process of recycling plastic film requires that the material be taken from its sheet-like form and converted back into a raw product; this process is called reclamation. Recyclers buy consolidated material from the backhaul from distribution centers and commercial film haulers and through a process of grinding, melting and running through screws they produce plastic pellets similar to the original pellet used to make the film. Some recyclers are vertically integrated, meaning they produce pellets and use their own pellets as an input; others simply sell the pellets to plastic product manufacturers.

Once the plastic film is transformed to pellets it can be used as a raw product just like virgin plastic. Some end users make products from recycled content, while others combine smaller amounts with virgin ones. Whether or not end users incorporate recycled content depends heavily on the price of virgin plastic. When oil prices are low, virgin plastic is very cheap to produce and this makes it difficult for recycled pellets to compete. Fortunately, many brand companies have sustainability goals that include the use of recycled content, and this keeps the market alive no matter how cheap virgin resin becomes.
PlasticsMarkets.org

- Recycler Database:
  - List in Directory
  - Search for buyers
- Scrap Pricing
- Export Procedures
- National Recycling Reports
Resource Links

- ISRI Bale Specs

- APR Bale Specs

- PlasticsMarkets.org
  - [Connect suppliers and buyers of all types of scrap plastic]

- PlasticFilmRecycling.org
  - [Resource for plastic film recycling]

- RecycleYourPlastics.com
  - [Resources for common terminology and collection tips]
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Questions?