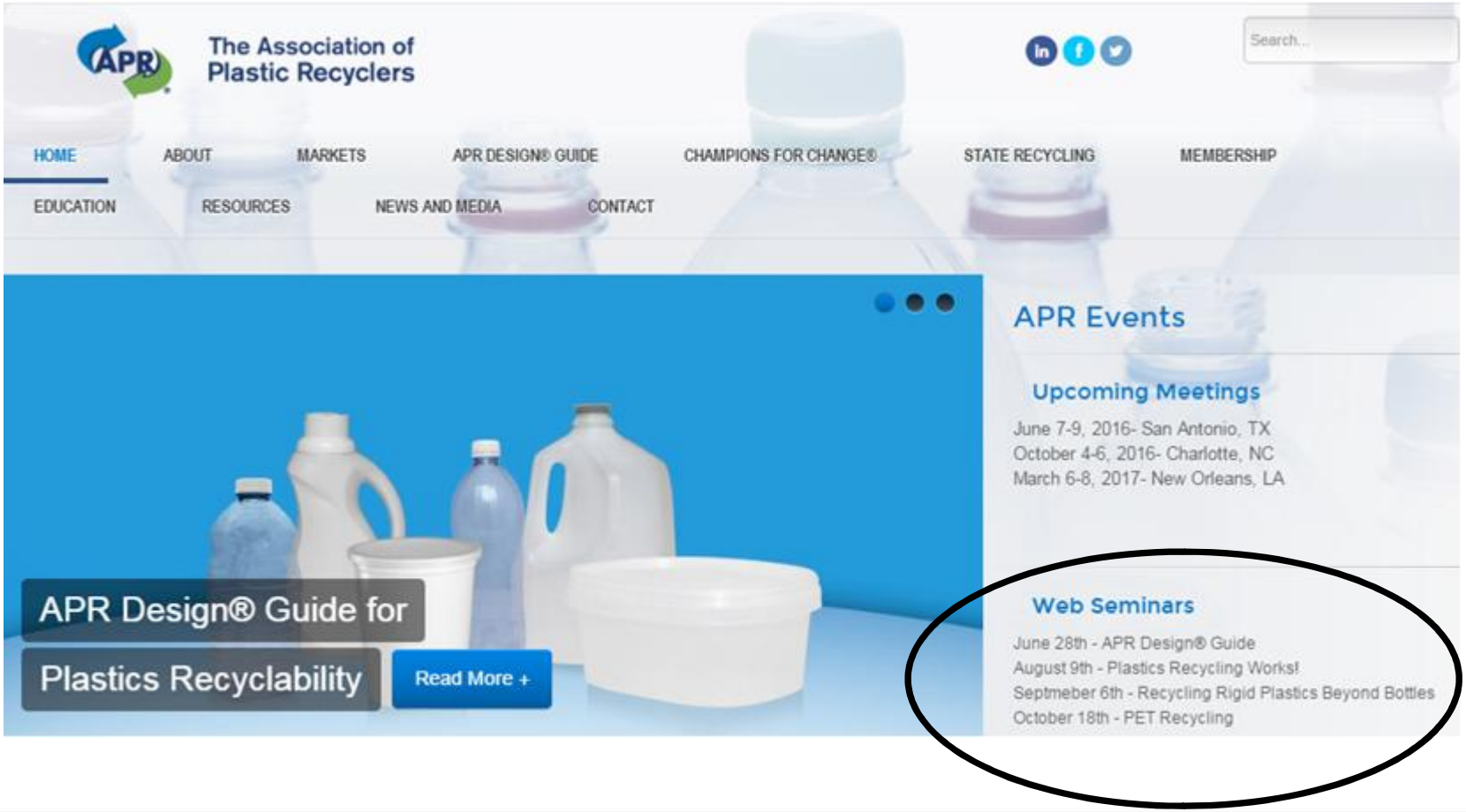
Plastics Recycling Works!

Facts and Figures to Support a Thriving Industry

The Association of Plastic Recyclers

August 9, 2016

Register for Upcoming Webinars!

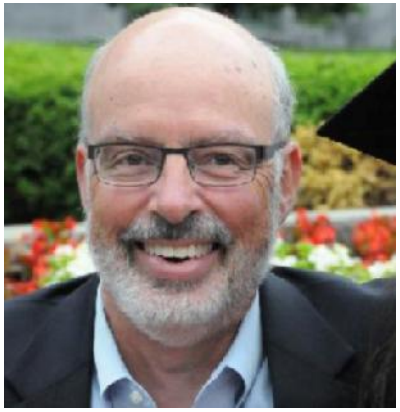


The Association of Plastic Recyclers

Today's Presenters

Kara Pochiro
APR Communications Director

Steve Alexander
APR Executive Director



Dylan de Thomas
Editorial Director, Resource Recycling

The Association of Plastic Recyclers

Today's Session

- State of Plastics Recycling
- Value of Recycling
- Plastics Recycling Markets
- Sustainability Goals
- Partnerships
- Technology and Innovations

The Association of Plastic Recyclers

Who is APR?

The Association of Plastic Recyclers

APR Primary Goals

Increase Supply

Enhance Quality

Communicate Value

Increase the Value Proposition of Recycled Plastics

The Association of Plastic Recyclers

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Plastic Recyclers

Technical Authority on Plastics Recycling

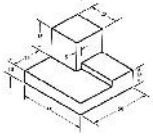
Technical Programs

Test Methods/Guidance Protocols

Brand Owner Training

APR Committees

Communication/Education/Advocacy



APR Design®Guide for Plastics Recyclability

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State of Plastics Recycling

- Challenging times
- Global Commodity
- Historical Trends
- Infrastructure Development

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Environmental Benefits of Recycling

- Energy Conservation
- Reduces Greenhouse Gas Emissions
- Conserves Natural Resources
- Landfill Diversion

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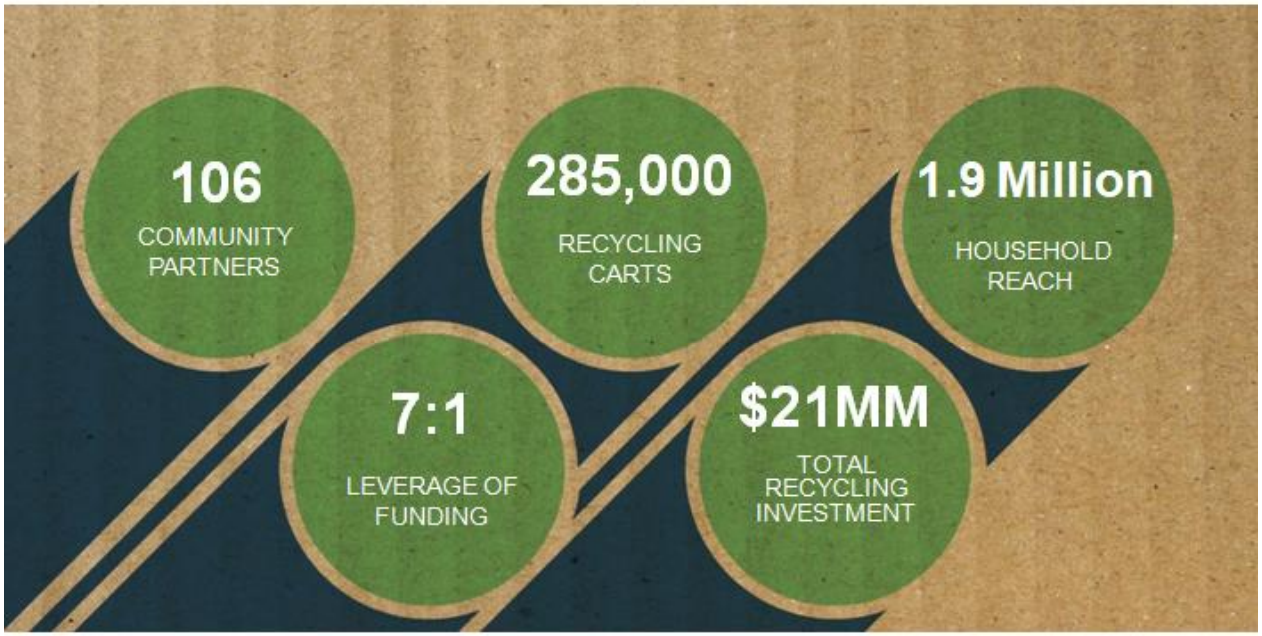
The Recycling Partnership

MAKING MEASURABLE CHANGE

Complete and Active Projects Totals



THE RECYCLING PARTNERSHIP | RECYCLINGPARTNERSHIP.ORG

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The Recycling Partnership

Over 10 years, that equates to:

	Florence, AL	Columbia, SC	Richmond, VA
WATER saved	86m Gallons	236m Gallons	338m Gallons
ENERGY saved	.46m MBTUs	1.2m MBTUs	1.8m MBTUs
GHG saved	37,000 metric tons CO2e	100,000 metric tons CO2e	143,500 metric tons CO2e
ECONOMIC value	$1.6m	$4.5m	$6.5m

CURBSIDE VALUE PARTNERSHIP
RecycleCurbside.org

THE RECYCLING PARTNERSHIP

The Association of Plastic Recyclers

The Recycling Partnership

LEADING TO GREAT ENVIRONMENTAL BENEFITS

Complete and Active Projects Totals

Projected Benefits from New Material Recovered by The Recycling Partnership's Grantees over 10 years:

Water: 1.9 Billion gallons saved

Energy: 10 Million MBTUs saved

GHG: 813,000 Metric tons of CO_2e saved

Economic Value: $27 Million

Tonnage: 354,000 Tons

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Economic Engine

- Industry Presence
- Sustainable Economic Impact
- Push to Vertical Integration – 2nd use has higher economic value

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Recycling Industry Jobs

- Recycling Industries
- Recycling Reliant Industries
- Reuse and Manufacturing Industries

The Association of Plastic Recyclers

Plastics Recycling Works: Facts and Figures to Support a Thriving Industry

Dylan de Thomas,
Resource Recycling

2016 APR Webinar Series

Aug. 9, 2016

RESOURCE RECYCLING

What We're Talking About Today

- Recycling as Feedstock
- Evolving Ton
- Manufacturing Markets
- It's Good to Have Goals
- Reframing Recycling
- Partnering Up

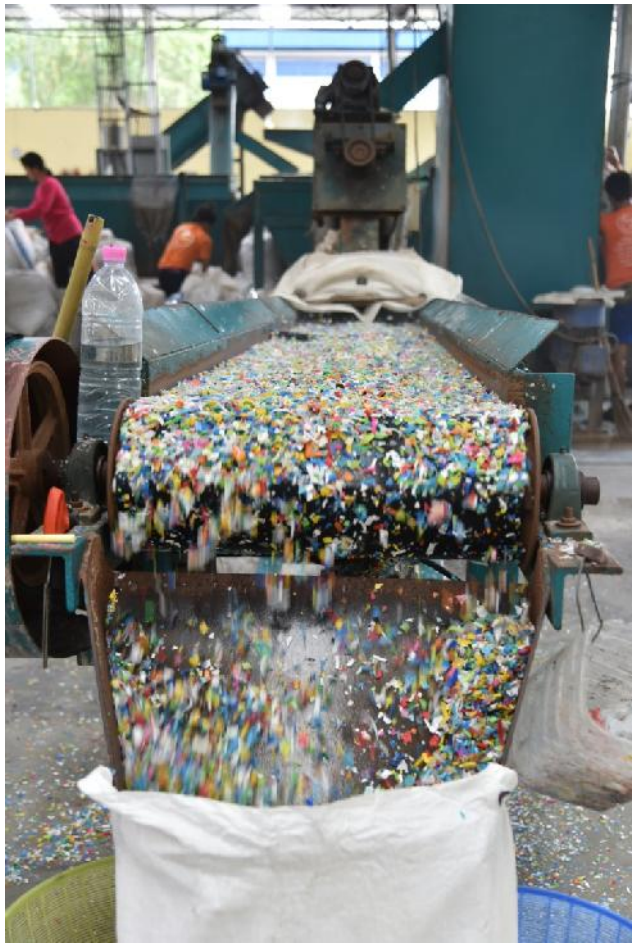
RESOURCE RECYCLING

What Are Recyclables Anyway?

RESOURCE RECYCLING

What Are Recyclables Anyway?

- *Raw materials* (that compete with other raw materials)
- You don't sell scrap, someone buys it



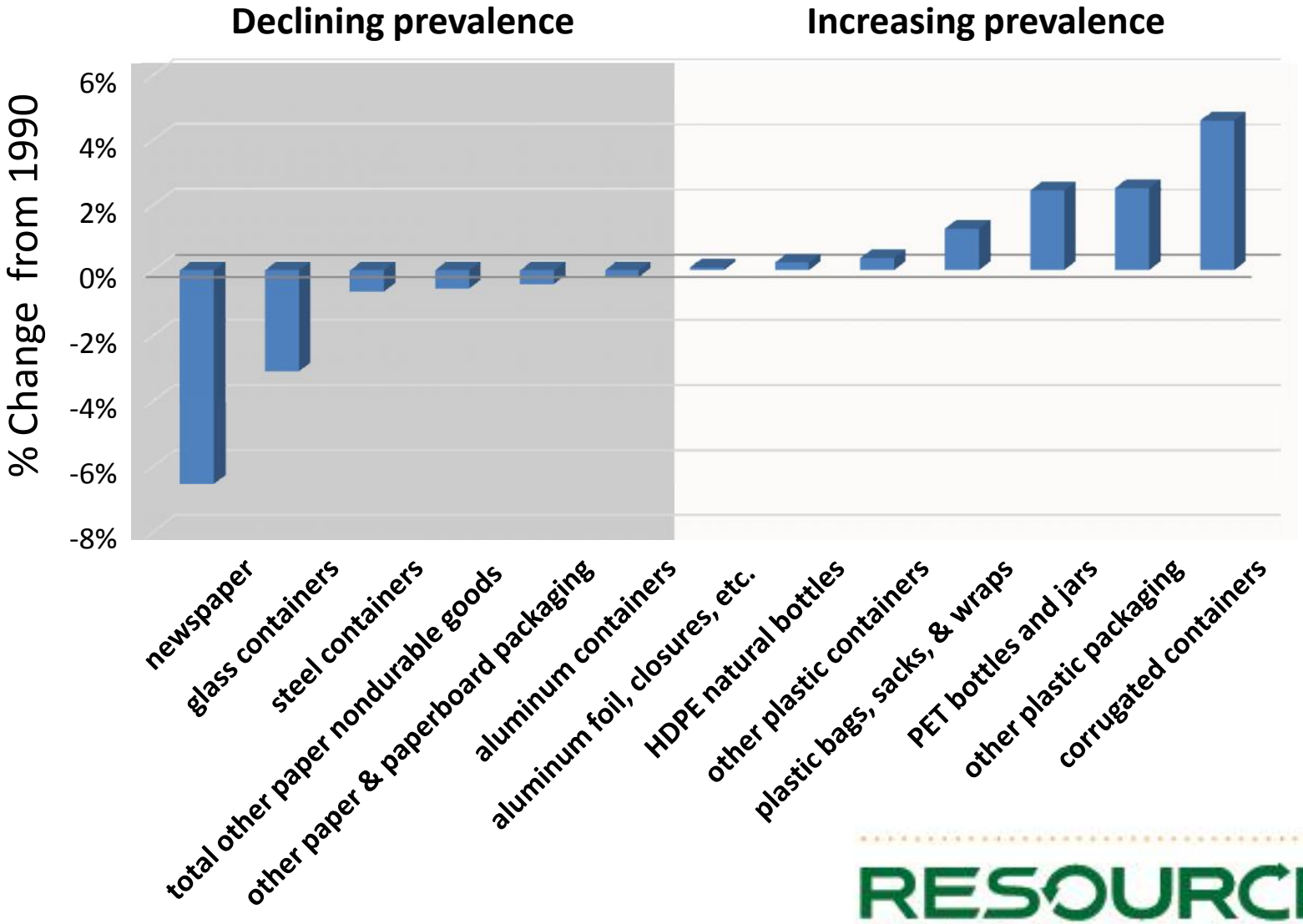
RESOURCE RECYCLING

What Are Recyclables Anyway?

- Supply disconnected from demand
- When demand drops, supply keeps on coming
- What about quality?

RESOURCE RECYCLING

Change in Paper and Packaging in 2012 since 1990



SOURCE: Resource Recycling Systems, 2014

RESOURCE RECYCLING

The Evolution of Packaging

Pharma / Over-the-counter

Baby Food & Formula

Cookies / Crackers

Coffee

Shaving

Pet Food

Juice

Nuts

Personal Care

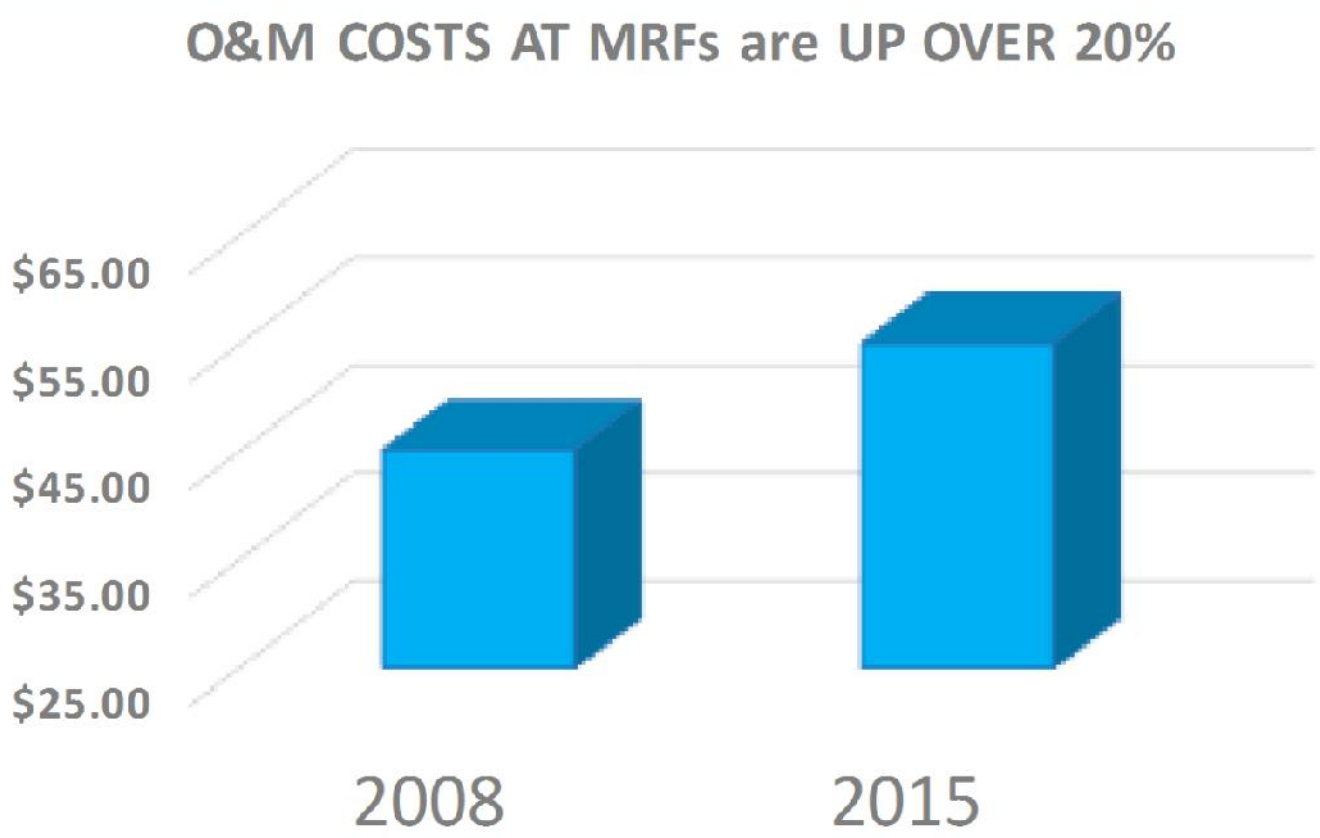
RESOURCE RECYCLING

From MRFs and PRFs …

- … To processors and reclaimers to markets
- Bale yields
- Increased processing costs

RESOURCE RECYCLING

Rising Operating Costs



Source: Resource Recycling Systems, 2015

RESOURCE RECYCLING

Recycling Commodity Markets Overview

RESOURCE RECYCLING

An Ugly Equation

Strong dollar +

Excess production of crude and other commodities +

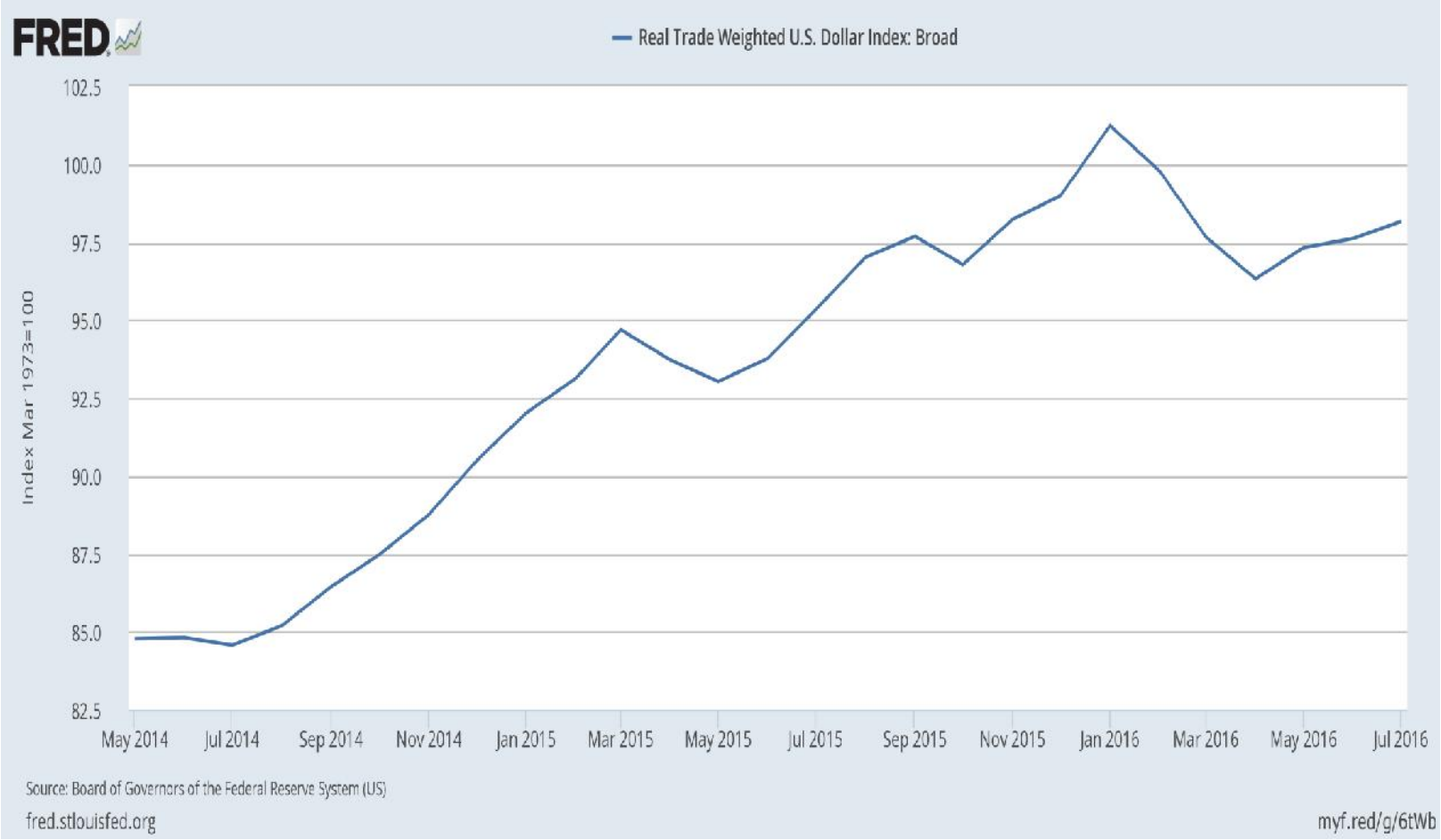
Changes in China +

Increased processing costs

= Down market, disappearing margins, hurting industry

RESOURCE RECYCLING

Strong U.S. Dollar



Source: Federal Reserve Bank of St. Louis Aug. 8, 2016

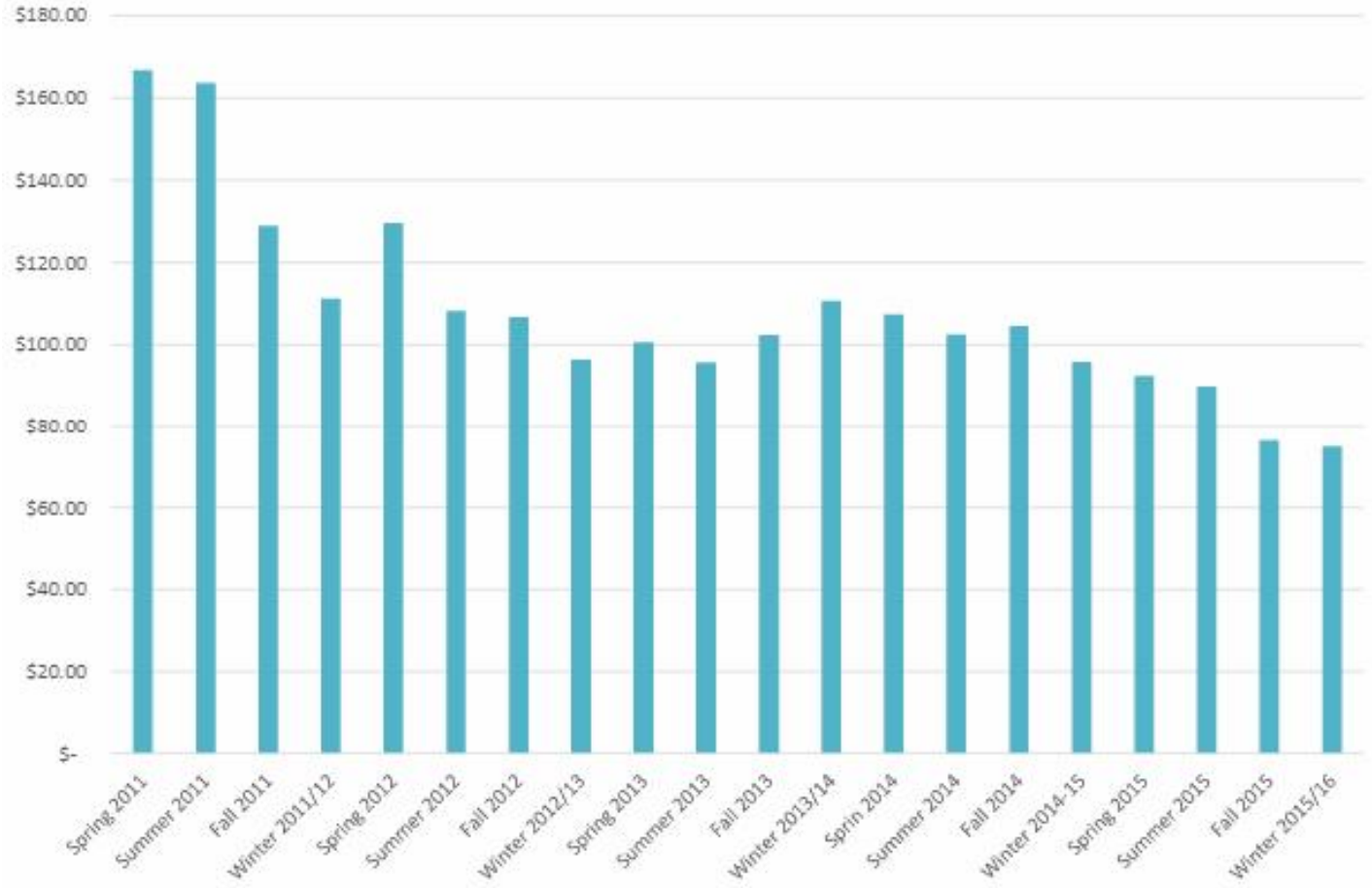
RESOURCE RECYCLING

Low Oil Prices

Source: New York Times, Aug. 8, 2016

RESOURCE RECYCLING

Value of a Commingled Ton



Source: Scott Mouw, NC DNER, 2016

RESOURCE RECYCLING

Value of Single-Stream Commodities

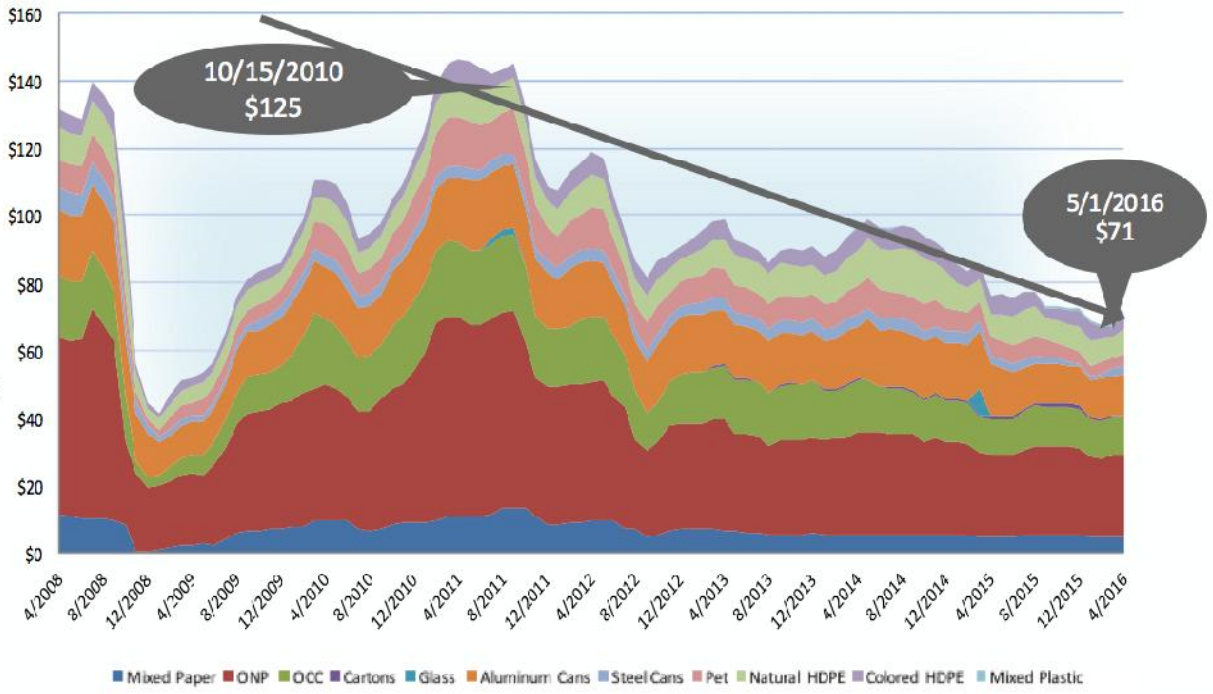
SINGLE STREAM COMMODITIES HOVER NEAR 6-YEAR LOW

SINGLE STREAM RECYCLING REVENUE/TON (AVG.)

(U.S. System-wide "Blended Value", "Average Value", "Avg. Commodity Value or Revenue", "Avg. Market Value" on ~20M TPY avg.)

$1.08B RECYCLING REVENUE LOST TO SYSTEM ANNUALLY

- >$1.5M per MRF
- Investment wains in the national MRF infrastructure
- Muni, MRFs impacted players
- >20% of MRFs close

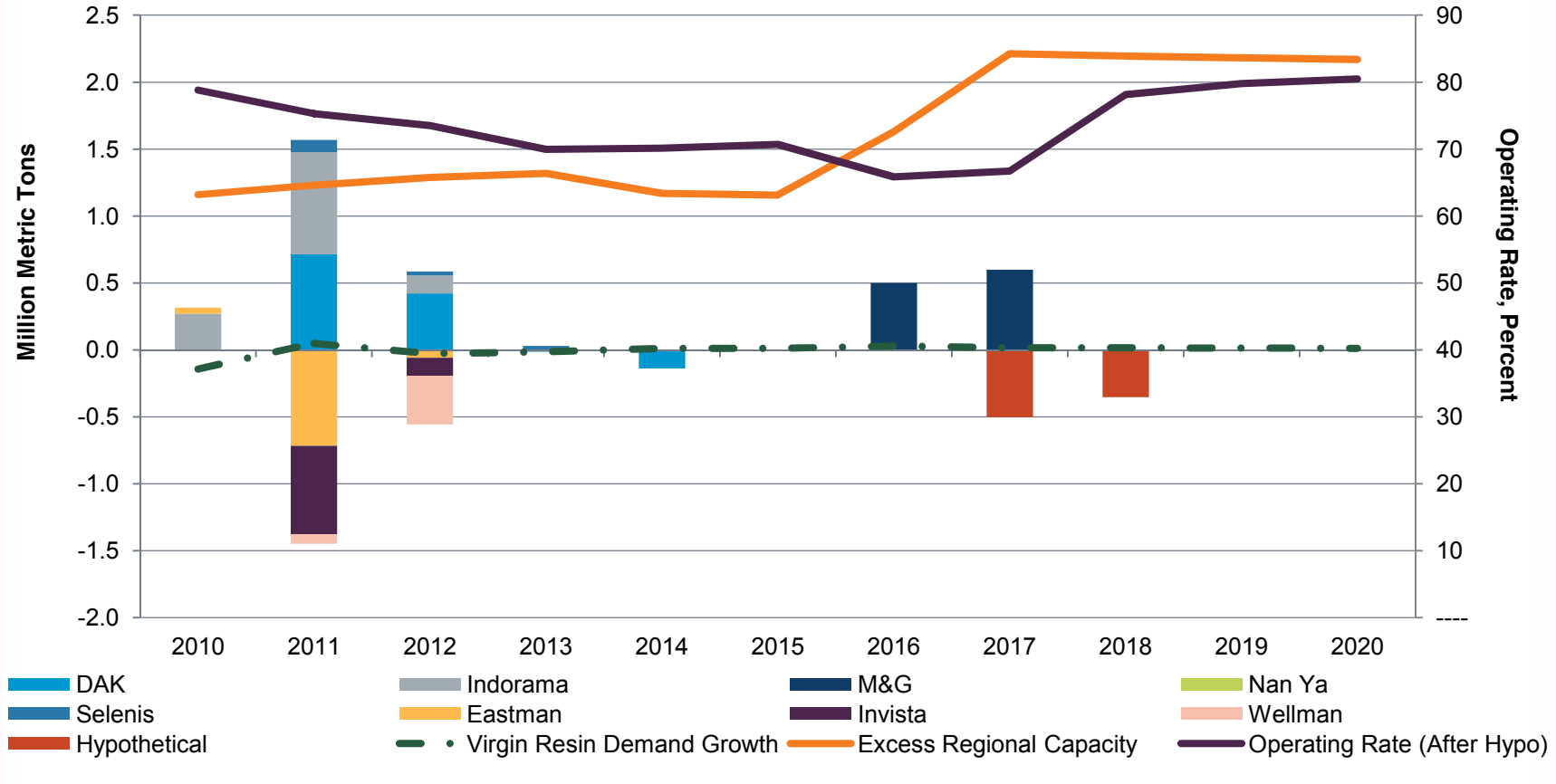


Source: Resource Recycling Systems, 2016

RESOURCE RECYCLING

Excess Capacity

North American Capacity Growth

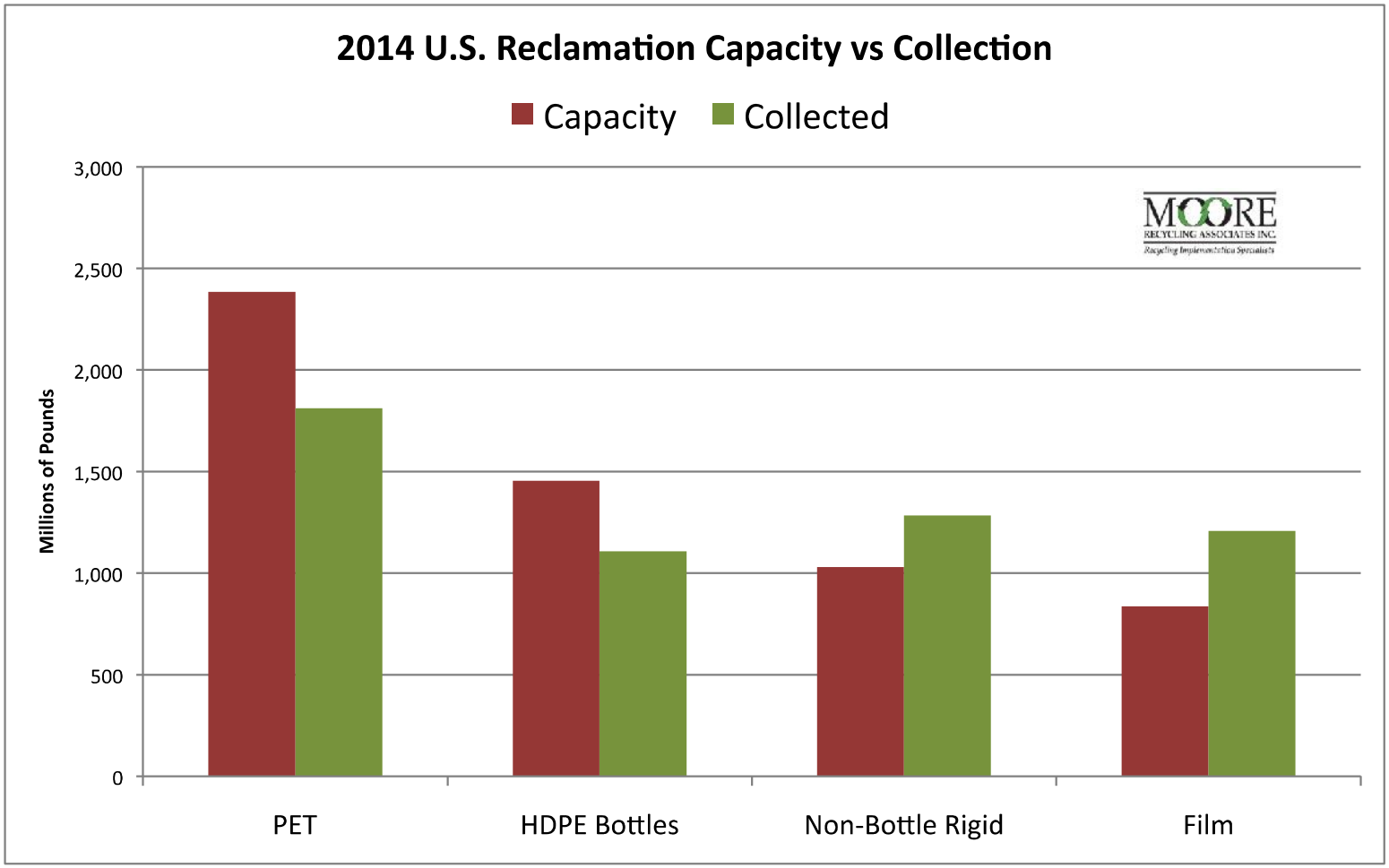


Source: IHS

© 2016 IHS

RESOURCE RECYCLING

Capacity Issues



RESOURCE RECYCLING

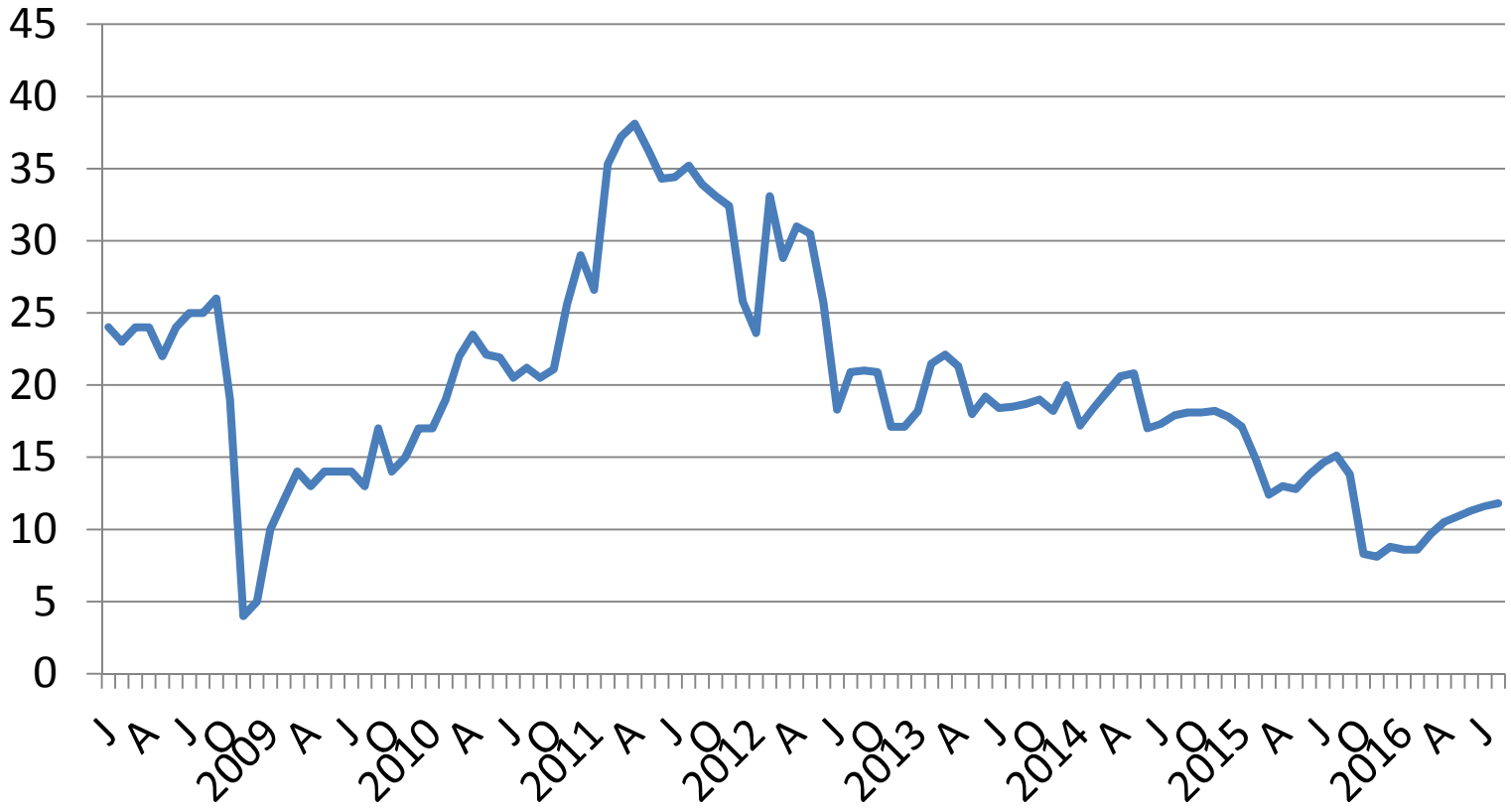
PET market conditions

Since the summer of 2011, when bales sold for about 38 cents per pound (FOB supplier's dock, East Coast), recovered PET bales have been on a long slide, with a small rise this summer.

Pricing is just over a dime now, as shown in the chart we maintain.

RESOURCE RECYCLING

PET bale prices



RESOURCE RECYCLING

PET market conditions

1. Flattening bottle demand
2. Lightweighting continue
3. Low PCR demand
4. Oversupply/end-users set the market

RESOURCE RECYCLING

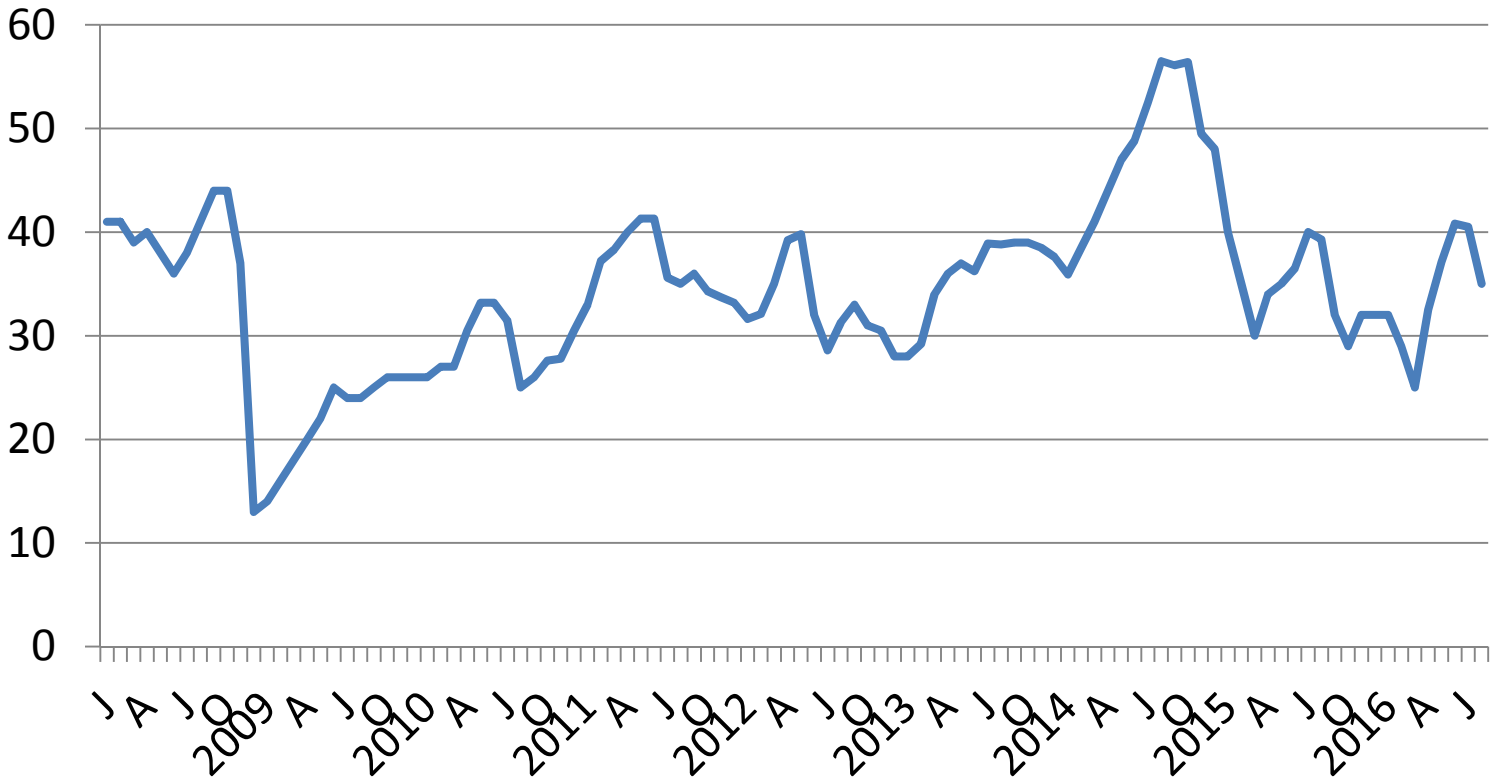
HDPE market conditions

HDPE has been affected by low oil and natural gas, as well.

The next graph displays HDPE homopolymer bale prices over the past six years (FOB supplier's dock, East Coast), which recently dipped.

RESOURCE RECYCLING

HDPE milk jug bale prices



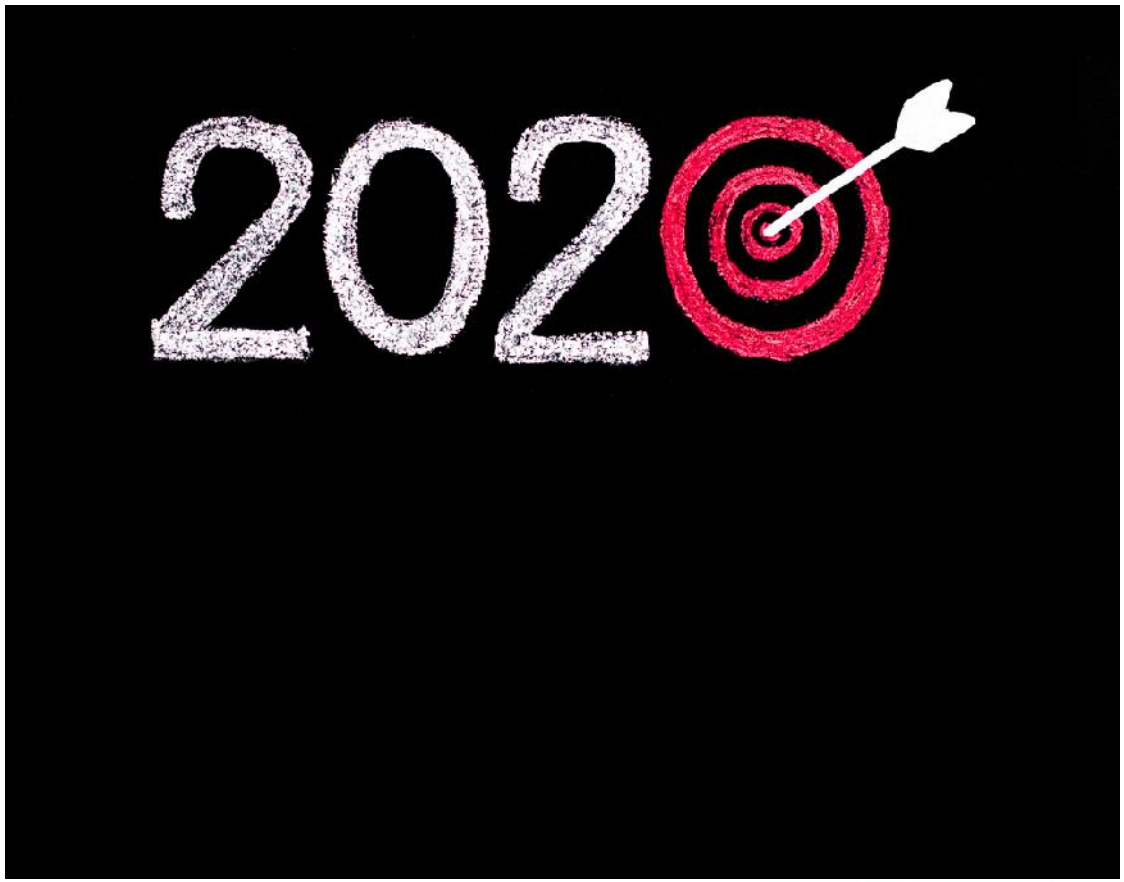
RESOURCE RECYCLING

HDPE market conditions

1. Got milk?
2. Weakness in PCR demand from some converters
3. New ethylene capacity in the U.S., which is dampening any upward resin price movement
4. Oversupply will continue to depress prices until market rationalizes

RESOURCE RECYCLING

Is the Future is 2020



RESOURCE RECYCLING

What's in a goal?

- **Calif. & Fla.**: 75% by 2020
- **Md.**: 65% by 2020
- **Phoenix**: 40% diversion
- **San Francisco**: "Zero waste"
- **Minneapolis**: 50% by 2020
- **EU**: 65% by 2030

RESOURCE RECYCLING

What's in a goal?

- **Keurig**: 100% recyclable K-Cups
- **Clorox**: 90% of products in recyclable primary packaging
- **P&G**: 90% of packaging recyclable
- **Unilever**: Increase post-consumer recycling by 15%
- **Tetra Pak**: Double recycling rate to 40%

RESOURCE RECYCLING

What's in a goal?

- **Coca-Cola**: "Recover and recycle the equivalent of 75 percent of the bottles and cans we introduce into developed markets by 2020."
- **PepsiCo**: "Help increase the U.S. beverage container recycling rate to 50 percent by 2018."

RESOURCE RECYCLING

What's After 2020?

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Recycling in Sustainable Materials Management

RESOURCE RECYCLING

The Reframing of Recycling

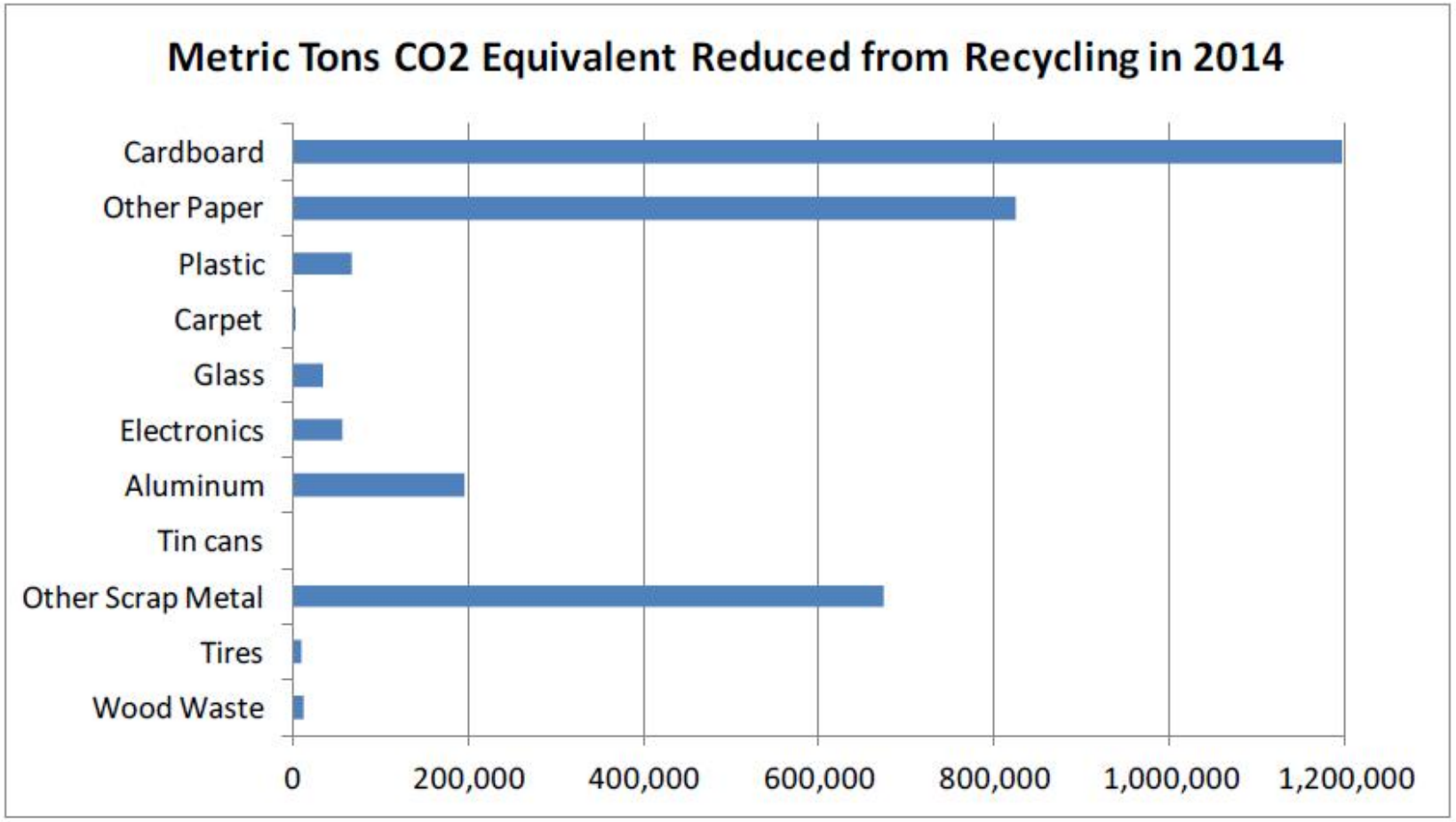
Sustainable Materials Management:
What Have We Learned? Where Does Recycling Fit?

1. Recycling conserves resources and reduces pollution
   - "Upstream" benefits are far larger than downstream ones – it's all about the markets!
2. The environmental impacts of production far outweigh the impacts of disposal
   - Recyclability or "design for reduced (solid) waste" not a consistent predictor of environmental outcomes
3. Ton-for-ton, waste prevention and reuse are better than recycling
   - Prioritize these, or at least don't undermine them
   - Recycling has potential, but its potential is limited

Source: Oregon DEQ, 2015

RESOURCE RECYCLING

The Reframing of Recycling



Source: Oregon DEQ, 2015

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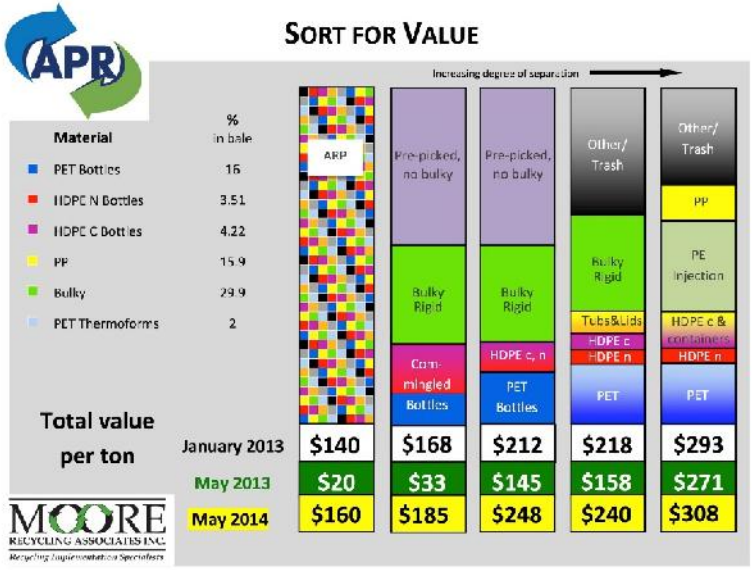
The Reframing of Recycling

- Recycling isn't on top
- Recycling has to seize this opportunity
- SMM is the future

RESOURCE RECYCLING

Partnering Up for Better Tools



RESOURCE RECYCLING

Growing Partnerships

THE RECYCLING PARTNERSHIP™

amcor

American Chemistry Council

APR

Ball

Carton Council

Coca-Cola

RESOURCE RECYCLING

Partnering for Funding

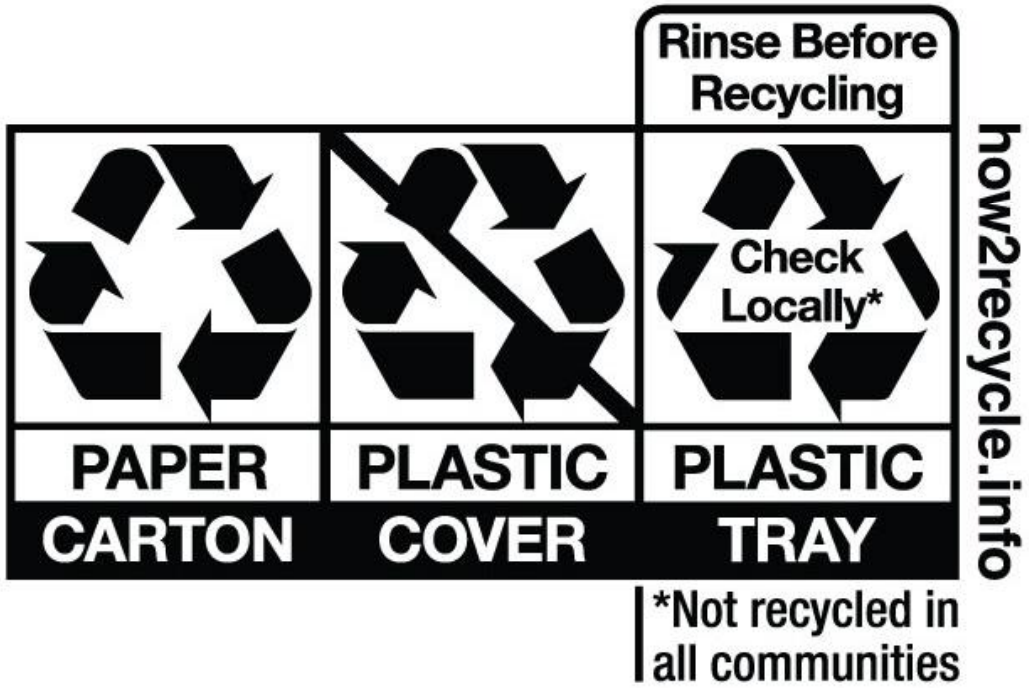
CLOSED LOOP FUND INVESTORS

Our supporters are some of the world's leading retail and consumer goods companies, including:

Walmart
Coca-Cola
PEPSICO
Johnson & Johnson
FAMILY OF CONSUMER COMPANIES
P&G
Procter & Gamble
Unilever
KEURIG
GREEN MOUNTAIN
Goldman Sachs
3M
COLGATE-PALMOLIVE
DR PEPPER
SNAPPLE GROUP

RESOURCE
RECYCLING

Partnering Up for Better Tools



RESOURCE RECYCLING

Partnering Up for Better Tools

ecycle)

- Corbion
- C-P Flexible Packaging
- DaniMer
- Darby Marketing
- Dart Container Corp.
- delfortgroup speciality papers
- OIA Global Logistics - Creative Packaging Solutions
- Omya
- Orange County, Florida
- Overwraps Packaging, Inc.
- Packaging & Technology Integrated Solutions, LLC (PTIS)
- Packaging Corp. of America
- PCH International
- Peel Plastic Products Limited
- Pennsylvania State University - Erie
- PepsiCo
- Plastic Ingenuity
- Plastic Technologies, Inc.
- Plastics Forming Enterprises LLC
- polyone
- Pratt Industries, Recycling Division
- Pratt Institute, Center for Sustainable Design Strategies
- Printpack, Inc.
- Prisma Renewable Composites LLC
- ProAmpac
- Procter & Gamble
- PTT MCC Biochem
- Replenish
- Reynolds Consumer Products
- Rochester Institute of Technology

RESOURCE RECYCLING

We Need Partners to Go Further

- Long-term contracts
- Help with demand
- Consumption innovation
- Supporting recycling even in down markets

RESOURCE RECYCLING

A Positive Equation

- Close the (financial) loop
- Demand has to increase

RESOURCE RECYCLING

The Innovation Equation

- Meeting challenges with technological advances
- Brands/buyers need to meet market

9,272,842	Beverage container sortation	San Juan, Puerto Rico
9,273,193	Polyurethane plastic recycling	Beaverton, Ore.
9,274,052	Optical sortation	Tokyo
9,259,861	Synthetic turf recycling	Dalton, Ga.
9,249,477	Precious metals recovery	Brussels
9,251,388	RFID-tagged recycling containers	Naperville, Ill.
9,255,194	Chemical PET recycling	Armonk, N.Y.
9,255,366	Concrete containing curmb rubber	Bergamo, Italy
9,248,620	Baler for recyclables	Burlington, N.C.
9,278,370	Recycling-friendly label adhesive	Ardee, Ireland
9,284,431	Floor covering recycling method	Muttenz, Switzerland
9,284,691	Recovered paper pulping method	Springfield, Missouri
9,284,694	Scrap polyurethane-based roadway	Redding, Calif.
9,287,552	Reintroduction of lithium into recycled battery materials	Bend, Ore.
9,289,774	Plastics recycling equipment	Ansfelden, Austria
9,289,919	Scrap plastics pretreatment processing	Ansfelden, Austria
9,290,944	Recycled roofing material	Malvern, Penn.
9,292,991	Reverse vending machine component	Shelton, Conn.
9,295,994	Scrap aluminum processing	Lancaster, Ky.
9,296,127	Plastic recovery from durable goods	Notthinghamshire, Great Britain
9,296,128	Rotating scrap plastics processing equipment	Ansfelden, Austria
9,296,326	Recycling-specific forklift truck	Modesto, Calif.
9,296,550	Recyclable plastic aerosol dispenser	Cincinnatti
9,296,868	Polyester film from recovered PET	Osaka, Japan
9,296,882	Composite plastics recovery method	Allentown, Penn.
9,296,913	Recycled crumb rubber coating	Dhahran, Saudi Arabia
9,302,950	Composting container	Charlotte, N.C.
9,309,392	Reinforced polymer composites from recovered plastic materials	Doha, Qatar
9,309,609	Post-consumer PET recycling	Omaha, Neb.
9,311,488	Removing personal information from recovered scrap electronics	Fort Worth, Texas
9,312,581	Lithium ion battery recycling	Paris
9,315,204	Recycling cart	Oshawa, Calif.
9,316,596	Optical sortation device	Plessisville, Quebec
9,321,138	Box spring recycling	Portland, Ore.
9,321,916	Strapping made from recovered PET	Schwelm, Germany

RESOURCE RECYCLING

Top Five Takeaways

1. Recyclables are Raw Materials
2. Silver Bullets Don’t Exist
3. Pushing Industry is Integral
4. SMM is the Future
5. Partnerships are Still Needed

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Save the Date

RESOURCE RECYCLING

Hotel Spammers

- **We are not affiliated with any third-party housing company**
- **We are doing what we can to stop them**
- **We're sorry you have to put up with them**

RESOURCE RECYCLING

A Huge Thanks to…

- Moore Recycling Associates
- IHS
- Resource Recycling Systems
- PetroChem Wire

RESOURCE RECYCLING

And Thank You!

Dylan de Thomas
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www.plasticsrecycling.com

RESOURCE RECYCLING

Technology, Innovation, and Resources to Support Industry Growth

THE APR DESIGN® GUIDE FOR PLASTICS RECYCLABILITY

The Association of Plastic Recyclers

APR Champions for Change®

- Testing Protocols
- Critical Guidance Recognition
- Responsible Innovation
- Consumer Brand Training Program

The Association of Plastic Recyclers

Innovations- Critical Guidance Recipients

Critical Guidance Recognition Recipients

2016

SKC, Inc. Multi-Color Corporation UPM Raflatac Plastipak Packaging

2015

Auriga Polymers, Inc. (Indorama Ventures) Klöckner Pentaplast Films Eastman Chemical Company CCL Label

2014

Plastipak Packaging, Inc The Kennedy Group Polysack Flexible Packaging Ltd Avery Dennison Corporation American Fuji Seal
Auriga Polymers, Inc. UPM Raflatac DAK Americas LLC Plastipak Packaging, Inc Sleever International

The Association of Plastic Recyclers

Innovations - 2016 APR Plastics Recycling Showcase:

- Multi-Purpose High Density Polyethylene Cable Reel from Carris Reels
- Coca-Cola's "Simply Beverages™" line of Juices and Juice Drinks with Constantia SpearRC Pressure Sensitive Labels
- PE and PP Compatibilization with Dow INTUNE™ Olefin Block Copolymers
- Indorama's PolyClear® EBM PET 5507 Resin for Extrusion Blow Molding
- AUTOSORT FLAKE by TOMRA Sorting Solutions
- Petstar's LEED Platinum Certified Recycling Museum - Auditorium

The Association of Plastic Recyclers

Upcoming APR Webinar

- Recycling Rigid Plastics Beyond Bottles
- Resources to Support Collection Expansion
  - Containers
  - Bulky Rigids
  - Caps on Bottles
- September 6th – Register Now!

The Association of Plastic Recyclers

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