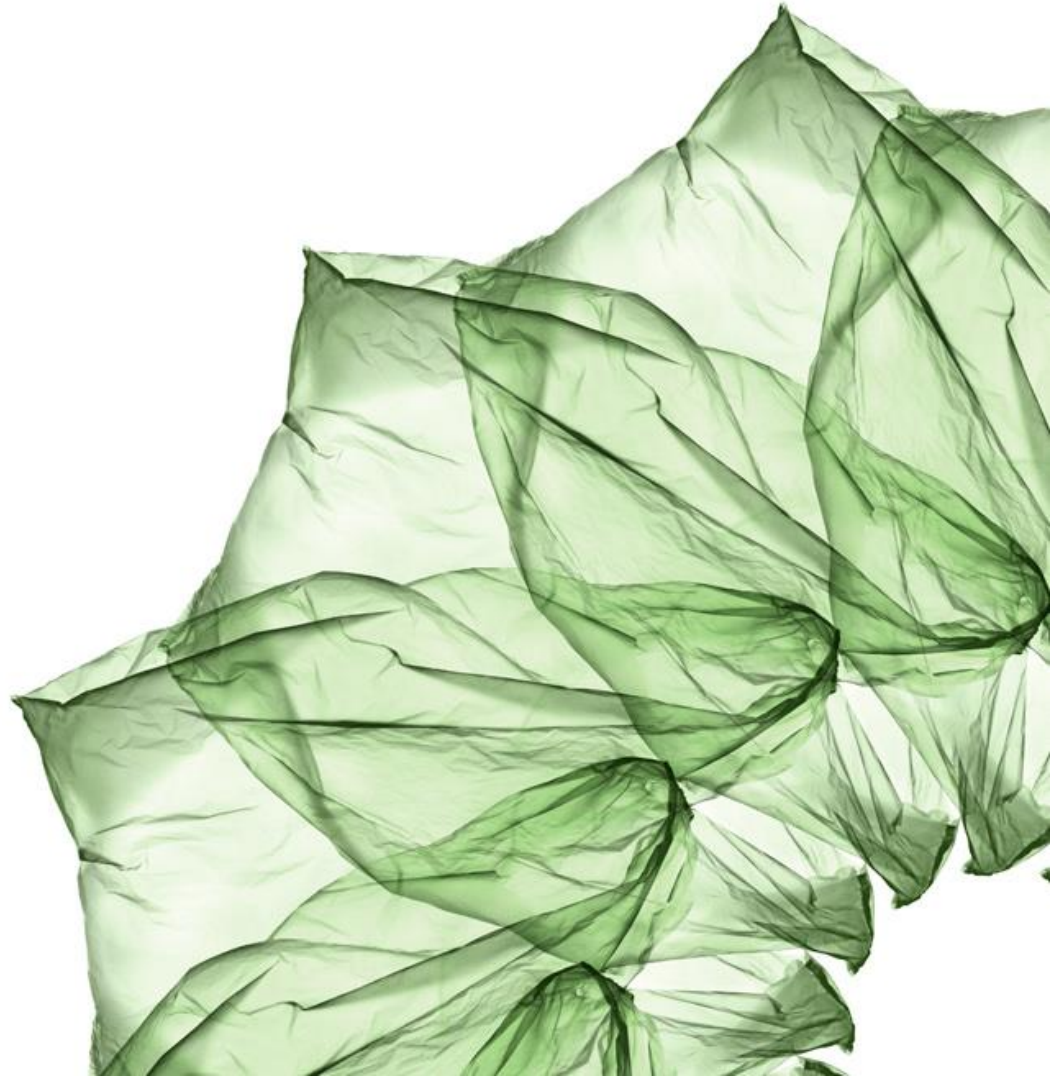


# The Changing Waste Stream

EPA Webinar Series

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Waste Management

November 13, 2014



## Trends in recycling

What makes something recyclable?

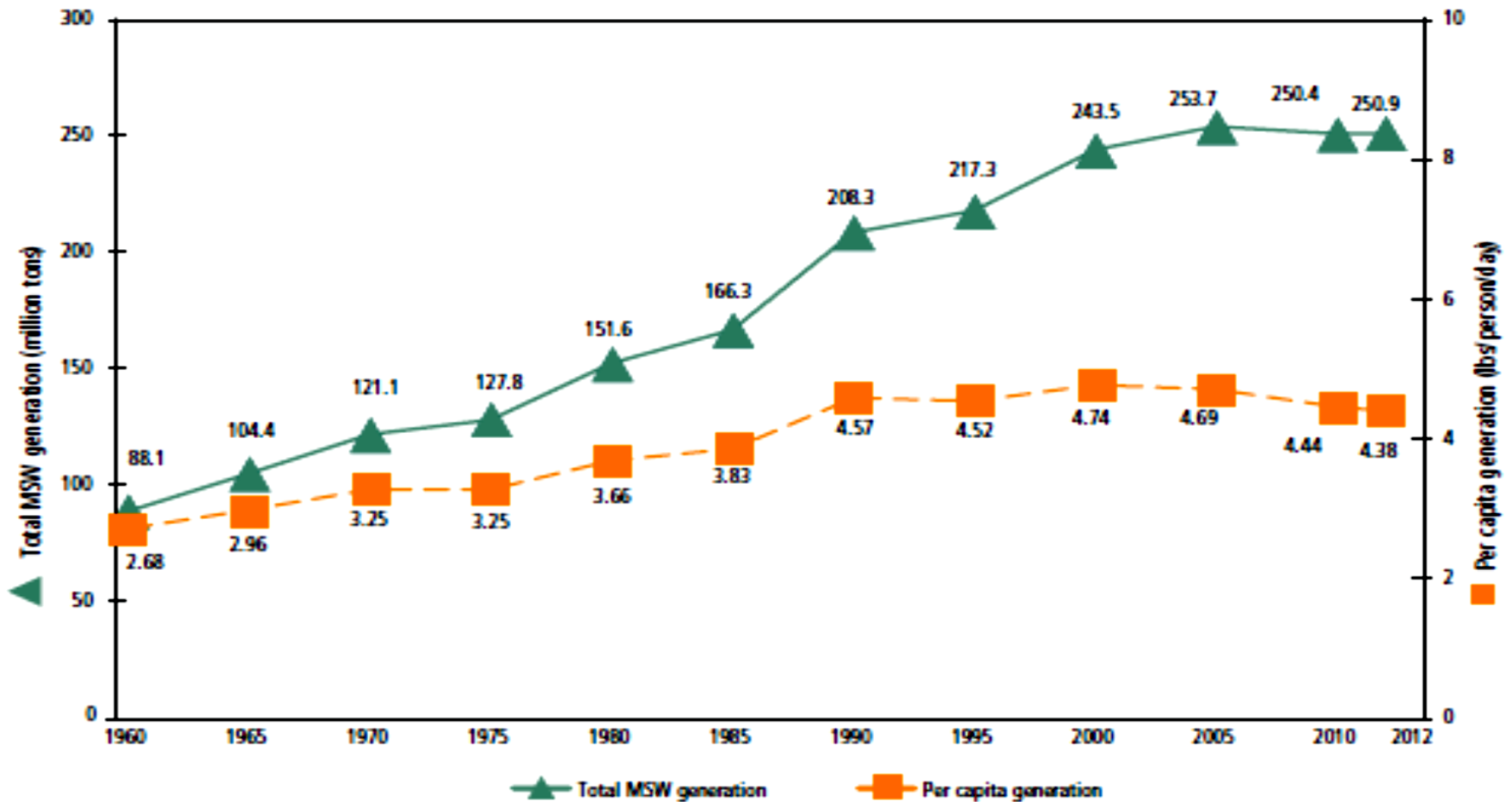
What's next?

# The Evolving Ton

- The materials and products we use in our daily lives have evolved
- Per capita waste generation is down 8% since 2000, affecting recycling, landfilling and waste-to-energy.
- We are seeing less paper, more plastic and no growth in metal.



# Waste generation and recovery rates in the U.S.

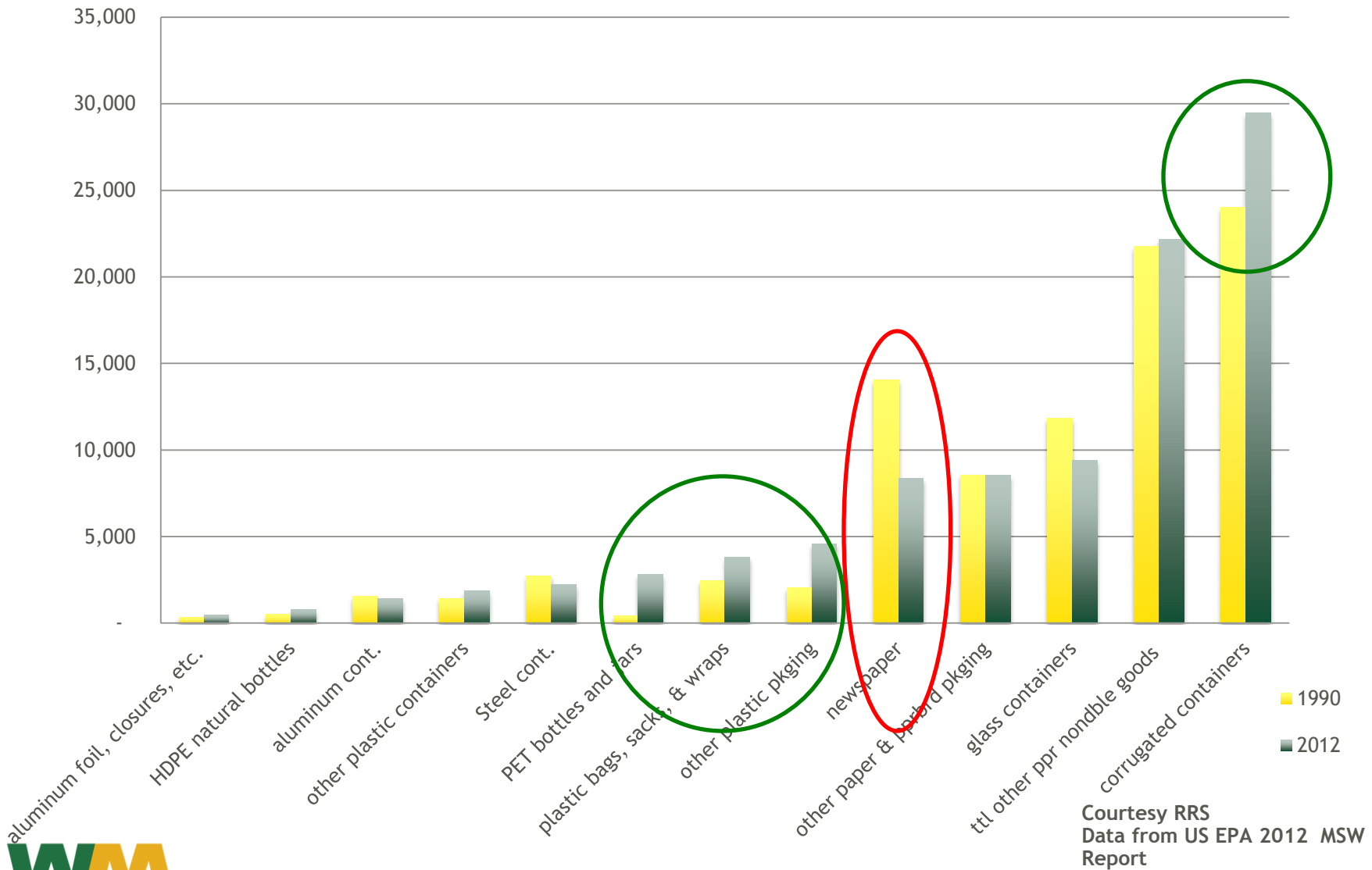


<sup>1</sup> U.S. short tons unless specified.

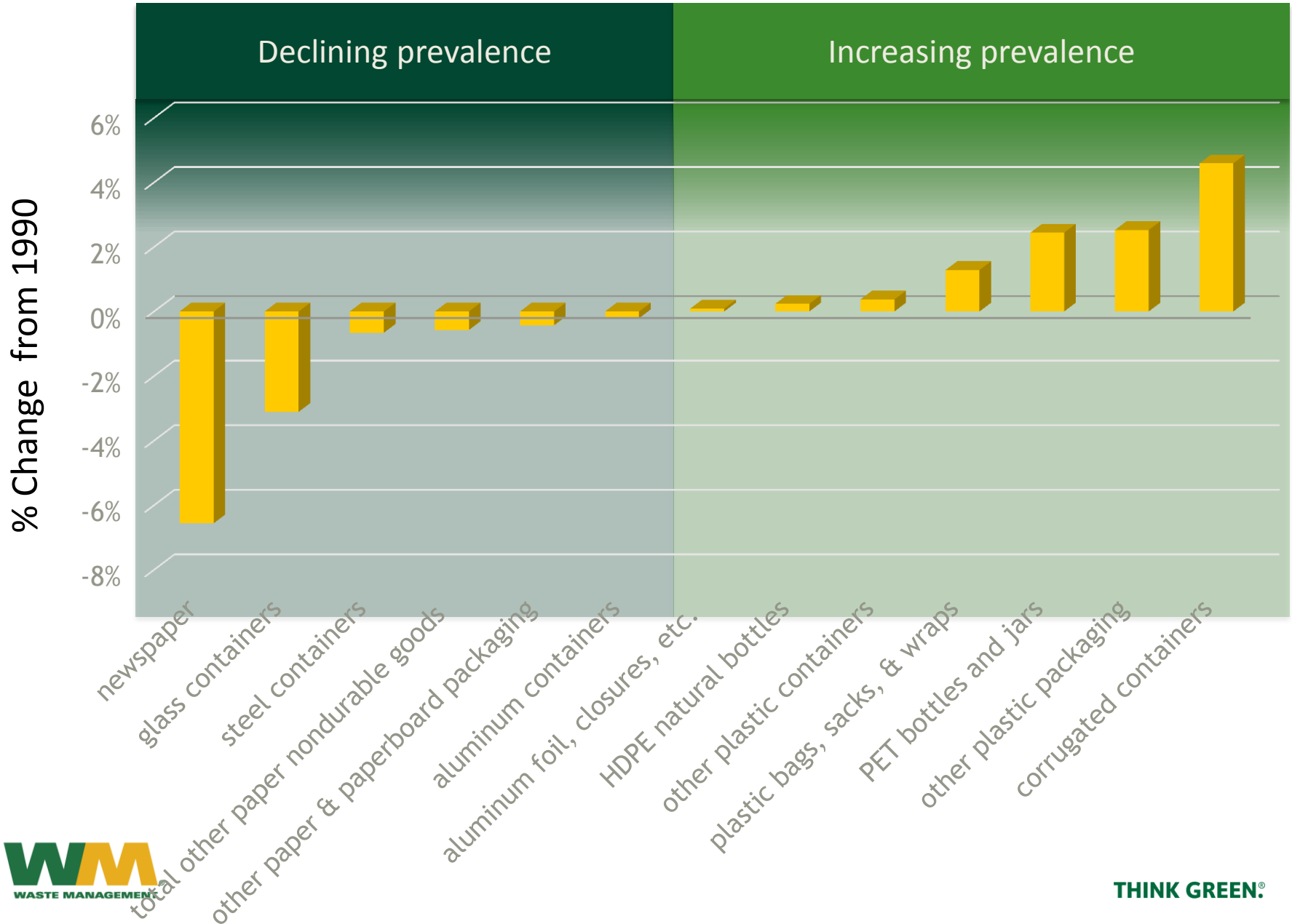
US EPA 2012 MSW Report

# Paper & Packaging Generation 1990 vs 2012

(thousands of tons)



# Change in Paper and Packaging in 2012 since 1990



# Change in the Recycling Industry

## A history of change

Change is not new to our industry:

- Glass to aluminum
- Glass and aluminum to plastic
- Trend from source-separated collection to single stream collection
- Ongoing trend towards domestic market constriction and growth in export markets

What is different/the same in 2014?

# Paper

## A changing industry

- **Newspaper** has historically made up 60% of recyclables collected. All types of paper made up 80% of the material we received for recycling.
- A **50% reduction in newspaper** readership in last 10-years resulting in the consolidation/closure of major recycled **newsprint** mills in North America
- There is an increase in residential single stream material which has increased the volume of a grade called **Curbside Mixed Paper.**
- New low cost manufacturing technology in China competes with aging North American machines so more Mixed Waste Paper goes to China



# Plastics

## Impact of changing market conditions

- At the same time that paper grades have changed, plastics volumes are increasing
- Plastics made up 12.7% of the waste stream in 2011, up from 10.5% in 2010
- The 12.7% plastics in the waste stream by weight makes up over 25% of the waste stream by volume
- Use of single serve containers and plastic packaging is up
- Plastic bottles have “light weighted” - water bottles take up the same space (volume) but weigh up to 25% less
- Recyclers must process more bottles to get a ton, and these tons are more expensive to process.
- Our cost are incurred by volume and our revenue is by weight.

The changing waste stream means we process more volume with less weight which leads to higher processing costs

# The evolving package



Glass jars,  
metal cap to  
**PET jar,**  
**PP cap**

- Light-weighting
- Flexible packaging expected to grow 4-6% annually in the next few years



HDPE Bottle, PP Cap to multi-layer, flexible film pouch



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

# Packaging comparison

Package	Product Weight	Package Weight	Product: Package Ratio	Emissions Kg CO2 e / 8 oz.
<u>Beverages</u>				
Glass bottles/ cap	8 oz	198.4 g	1:1	0.29
PET/cap	8 oz	22.7 g	01:1	0.18
UBC	8 oz	11.3 g	21:1	0.08
Pouch	6.75	<u>5.7 g</u>	35:1	<u>0.02</u>
<u>Soup Can</u>				
Steel can	108 oz	312.4 g	10:1	1.07
Pouch	108 oz	<u>28.4 g</u>	108:1	<u>0.11</u>

These products have environmental and health benefits. Looking at only at end-of-life may result in unintended consequences.

## Net impact on MRFs: Lighter inbound material

- The volume in a ton has increased with the loss of ton density.
- Inbound material at MRFs is now 45-60% paper and 40-55% containers
- Glass and residue is a greater percentage of our recycling mix

These all have implications on the design of MRFs, and increase the cost of recycling

Trends in recycling

**What makes something recyclable?**

What's next?

# What makes something recyclable?



Collection

1. Convenient recycling collection is important for successful programs. Cart based single stream collection allows for broader collection and more types of materials collected (pro and con). It also increases recycling volumes collected and allows for collection.
2. At the same time, single stream recyclables often are wet, dirty and contains broken glass. The material is flattened during compaction, and the flatten recyclables may be mis-sorted



Processing

1. Processing/sorting single stream recyclables requires both technology and labor.
2. There are physical limitations to what can be recycled. Equipment and staff may not be able to identify or separate certain materials.
3. Film plastic is the single biggest processing problem at MRFs. Food and moisture also challenge the process.

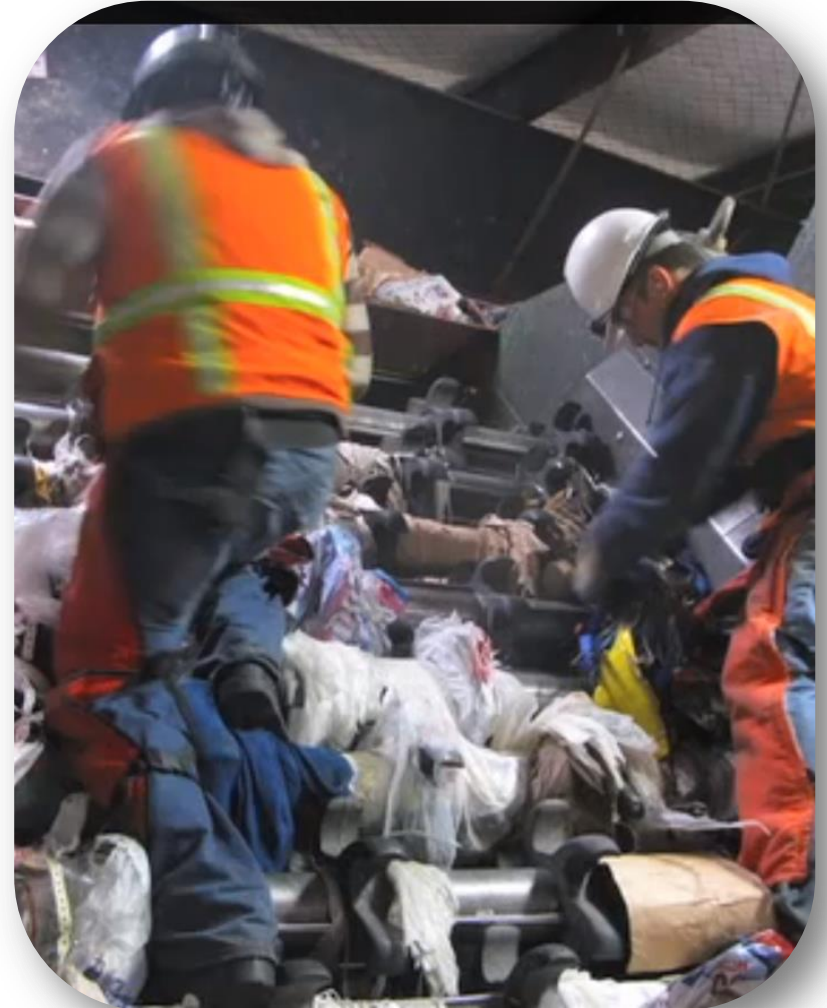


Marketing

1. Robust markets are critical for sustainable recycling. Volume + value = market.
2. Markets are global. WM exports 33% of its material - mostly paper, some PET, HDPE most 3-7 plastics.
3. There is a robust market for clean and dry film plastic film collected in take-back programs. None for film collected at curbside.



# Film Plastics in Disc Screens



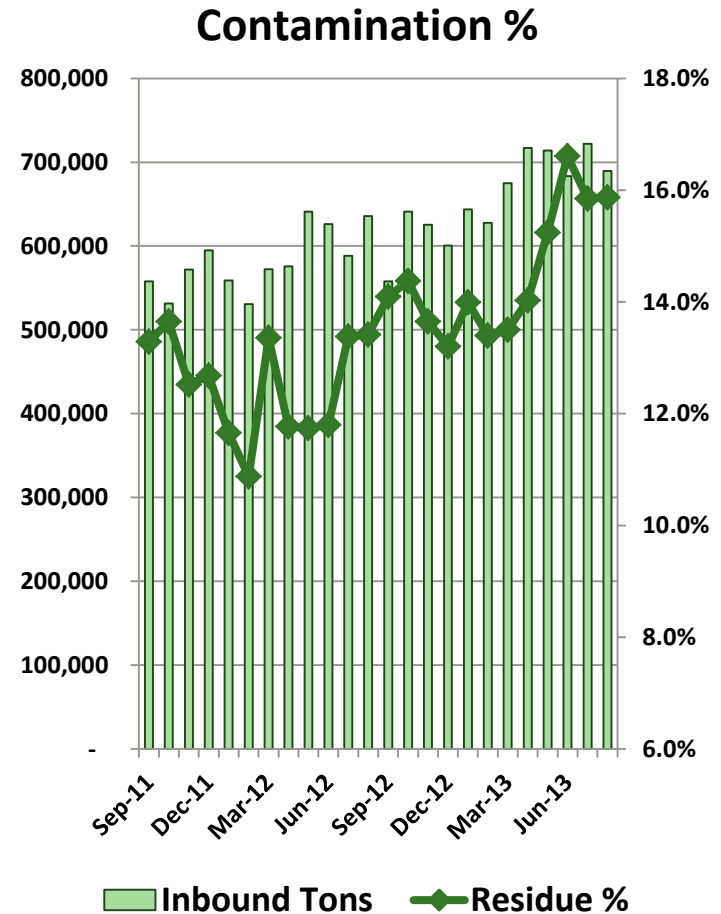
# Price and Volume





# Contamination in Single Stream Recyclables

- Contamination of loads is *on average* 16% of inbound tons and increasing
- Contamination can be up to 50% of incoming loads
- Contamination cost an average of \$140 per ton
- Markets are demanding reduced contamination (Green Fence)
- Processing costs have increased by 20% in two years, which is driving up cost to customers



WM MRF Data - 2013

# What do these changes mean for recycling?

- The changing waste stream has increased processing cost at MRFs, driving up the overall 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 revenue. Communities with revenue-sharing may see less revenue from the sale of commodities.
- A lighter recycling stream makes it harder to increase recycling rates
  - More light-weight plastic
  - More lower value materials
  - Light-weighting of all packaging

Trends in recycling

What makes something recyclable?

What's next?

# Back to the Basics: Public Education and Outreach for Recycling

Recycle Often. Recycle Right.<sup>SM</sup>

The Path to Sustainable Profitable Recycling



# Recycle Often. Recycle Right.<sup>sm</sup>

## Getting Back to the Basics of Recycling

- Built on behavior change science framework:
  - Keep it simple
  - Focus on barriers and benefits
  - Tell people why
  - Ask for a commitment
  - Measure and scale
- Focus on specific changes that are (almost) universal; can translate on a national level
- Focus on basic materials with large recycling potential: paper, bottles and cans
- Address contamination issues that cause the most issues at MRFs: Wet items and plastic bags
- Help lead industry towards improved recycling



# Simple Messages



Recycle all my empty bottles, cans and paper.



Keep food and liquids out of my recycling.



Keep loose plastic bags out of my recycling.

## Simplifying the Message

- Focus on 3 simple behaviors that could greatly impact recycling nationally
- Tested
- Accompanying myth busters/FAQs for those that want to dig deeper

# Brochure

## You Have the Power!

Ever wonder, "Why and how to recycle?" Every day we encounter hundreds of recyclable items. By recycling properly, you help materials get to their next best use, which in turn saves tons upon tons of raw materials, time, energy and expense.

## It's Time to Rethink Recycling

69% of plastic bottles don't get recycled.\* 45% of aluminum cans end up in the garbage.\* Liquids often spoil a whole load of otherwise recyclable paper. That's why it's time to get back to the basics of good recycling. The fact is that some recycling actions make a bigger impact than others. These Recycling Rules will help you rethink recycling to make a sustainable impact!

Become a Recycling Ambassador. Whether you're a home owner, teacher, city official, business, kid, or a recycling enthusiast, all the information you need to help pass it on is just few clicks away.

\*Source: US Environmental Protection Agency

# RECYCLING RULES

## 1. RECYCLE ALL BOTTLES, CANS AND PAPER

## 2. KEEP ITEMS CLEAN AND DRY

## 3. NO PLASTIC BAGS

Certain offenders can slow down the recycling process or even ruin the load.

## Participation is Key!

Please consult your local municipality for their acceptable materials and additional details of local programs, which may differ slightly.

### Always recycle:



Plastic Bottles & Containers



Food & Beverage Cans



Paper



Flattened Cardboard & Paperboard



Food & Beverage Cartons

### Do NOT include in your recycling cart:



NO Food Waste



NO Plastic Bags & Film



NO Foam Cups & Containers



NO Needles

To Learn More Visit:  
[website-xxxxx.com]

# Poster

Realize the value of recycling.  
Here's how.

Questions?

[Contact Customer Service:  
000 000 0000  
email@xxxxx.com]

**Always recycle:**



**Plastic Bottles & Containers**



**Food & Beverage Cans**



**Paper**



**Flattened Cardboard & Paperboard**



**Food & Beverage Cartons**

**Do NOT include in your mixed recycling cart:**



**NO Food Waste**  
(Compost instead!)



**NO Plastic Bags & Film**  
(Find a recycling site at [plasticfilmrecycling.org](http://plasticfilmrecycling.org))



**NO Foam Cups & Containers**  
(Check [Earth911.org](http://Earth911.org) for options.)



**NO Needles**  
(Keep medical waste out of recycling.  
Place in safe disposal containers.)

**To Learn More Visit:**  
[\[website-xxxxx.com\]](http://website-xxxxx.com)

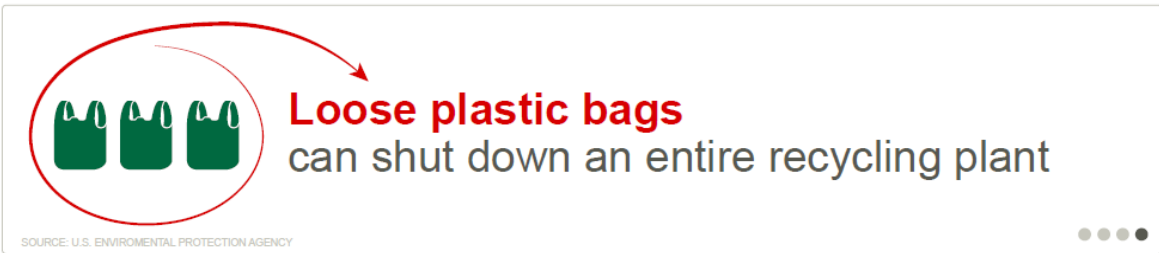
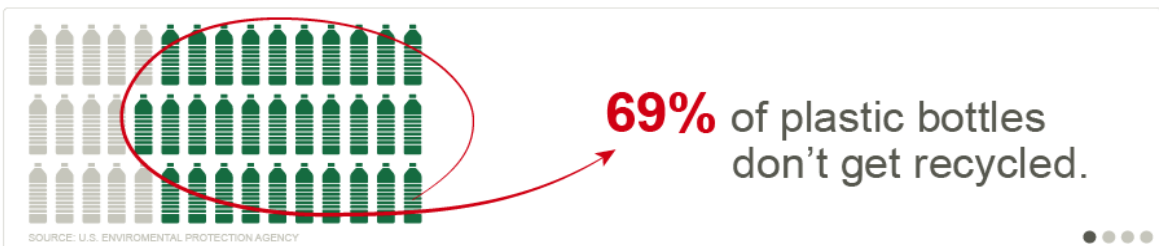
Please consult your local municipality for their acceptable materials and additional details of local programs, which may differ slightly.



**THINK GREEN®**



# Tell People Why



# MythBusters (sample)

**MYTH:** Most Americans recycle all they can

**ANSWER:** False

Research shows convenience and commitment are required for maximum recycling. For instance, is there more than one location in a household to store recyclables? If not, recyclables in areas other than the kitchen get thrown away.

Additionally, is there only one committed recycler in a household (usually the person who picks up after everyone)? If so, studies indicate making this a family/partner affair where everyone participates, allows the most recycling of the right materials.



**MYTH:** The recycling arrows (Mobius) on a container means it is recyclable at a Material Recovery Facility (MRF)

**ANSWER:** Only in some cases

Manufacturers strive to get eco-friendly information on their product labels. It sells. The FTC requires that a product have at least 60% access to local programs (like Material Recovery Facility processing) across the U.S. to include the Mobius on their products. However, the Mobius is not

a reliable indicator of whether something gets recycled. There are thousands of plastic products and packaging, and each one has its own unique chemical recipe. Many plastics cannot be made into new products at this time. Recycle plastics by shape: bottles, jars, jugs and tabs.



**MYTH:** It doesn't matter if something belongs in the recycling cart, the hauler will sort everything anyway

**ANSWER:** False

There are increasing amounts of non-recyclables sent to Material Recovery Facilities, and every single one of them must be removed by hand by trained staff and/or mechanically sorted, or they end up contaminating high value recyclables. Non-recyclable garbage placed into recycling containers increases the cost of the recycling process and will increase the cost of garbage and recycling collection service.

Similarly, recyclable items placed into garbage containers are usually hauled to a landfill. Recyclables in a landfill cannot be recovered effectively. Even if further processing takes place, the full value is lost. The right thing to do is to put the all the right recyclables in the recycling container and non-recyclables into the garbage containers. Recyclables with the greatest impact are bottles, cans, and paper.



**MYTH:** All plastics can be recycled.

**ANSWER:** False

Not all plastics can be successfully recycled. At this time, only some plastics can be made into new things. Recycle plastics by shape: bottles, jars, jugs and tubs.






# Mythbusters

**MYTH:** All plastics can be recycled.

**ANSWER:** False

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ITEM	ANSWER	MORE INFO
<p>Clamshell Packaging</p> 	<p>No</p>	<p>The plastic "to go" containers or containers holding berries, apples, bakery items, etc., are not consistently made of high-value plastic, are difficult to recycle and are usually contaminated with food when disposed. See more at: <a href="http://oregonstate.edu/sustainability/blog/2014/01/recycling-mythbusters-plastic-recyclables">http://oregonstate.edu/sustainability/blog/2014/01/recycling-mythbusters-plastic-recyclables</a></p>
<p>Plastic eatery: utensils, plates and cups</p> 	<p>No</p>	<p>Plastic straws, utensils, including "compostable" utensils, plastic plates and plastic cups come in such a wide variety of non-usable, low-grade plastics that it is impossible to identify and separate the recyclables from the non-recyclable look-alikes (same as the clamshells). Fast food packaging, like utensils, are complicated and are not readily recovered through modern Material Recovery Facilities (MRFs), or by secondary processors who buy MRF bales.</p>
<p>Chip bags, nutritional bar or candy wrappers</p> 	<p>No</p>	<p>There is no real end market for this, often hybrid material. In fact, there are only a few niche markets for it. Please consult your local municipality to discover any specialty recycling opportunities.</p>

# Mythbusters (sample)

## Plastic FAQs.

Are these items recyclable in my curbside mixed recycling program?



ITEM	ANSWER	MORE INFO
<p>Plastic bottle caps/lids</p> 	<p>Yes. After bottles are empty, plastic caps should be placed back on bottles.</p>	<p>"Until recently the plastics recycling industry was not able to effectively recycle bottles with caps on so the message to remove the cap was created. But recycling collection and processing technology have improved and demand for the recyclable material has increased and this allows for the updated caps-on recycling message and process." Association of Post Consumer Plastic Recyclers: <a href="http://www.plasticsrecycling.org/faqs/caps-on-faqs">http://www.plasticsrecycling.org/faqs/caps-on-faqs</a></p>
<p>Plastic bags</p> 	<p>No. Do not put loose plastic bags or bagged recyclables into cart – empty recyclables into cart.</p>	<p>Plastic bags are not accepted in most curbside recycling programs (they get tangled in the MRF equipment, breaking or stopping machinery.) (See <a href="#">KAB Sept 15, 2014 campaign</a>). Empty plastic bags should go back to a participating retail outlet or grocery store for recycling. For more information, visit: <a href="http://recycleyourplastics.org/Main/Plastic-bags-film.html">http://recycleyourplastics.org/Main/Plastic-bags-film.html</a> OR <a href="http://www.plasticfilmrecycling.org/s01/s01dropoff.html">http://www.plasticfilmrecycling.org/s01/s01dropoff.html</a></p>
<p>Plastic film</p> 	<p>No</p>	<p>Plastic stretch wrap, bubble wrap, and other plastic films get tangled in the MRF equipment, breaking or stopping machinery (See <a href="#">KAB Sept 15, 2014 campaign</a>). There are also different types of plastic film that are not compatible with each other and hard to tell apart for Material Recovery Facility workers, and even harder to sell if mixed together. Plastic film should go back to a participating retail outlet or grocery store for recycling. For more information, visit: <a href="http://recycleyourplastics.org/Main/Plastic-bags-film.html">http://recycleyourplastics.org/Main/Plastic-bags-film.html</a> OR <a href="http://www.plasticfilmrecycling.org/s01/s01dropoff.html">http://www.plasticfilmrecycling.org/s01/s01dropoff.html</a></p>

# Resources

- [www.RecycleOftenRecycleRight.com](http://www.RecycleOftenRecycleRight.com)  
Users can access the campaign online and make a digital promise to rethink recycling by “getting back to the basics of good recycling” and encourage others to do the same.
- EPA, KAB, SWANA and NW&RA collaborated to create:  
<http://beginwiththebin.org/recycling/recycling-smart>



RECYCLE OFTEN. RECYCLE RIGHT.

ABOUT VIDEO RESOURCES NEWSROOM SOCIAL CONTACT

69% of plastic bottles don't get recycled.

Maybe it's time to rethink recycling.  
Make the promise. Doing just these three things will make a huge difference.

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

First Name \_\_\_\_\_ Last Name \_\_\_\_\_  Sign me up to receive news, updates and information to help me keep my promise.

Email \_\_\_\_\_ Zip code \_\_\_\_\_

SUBMIT

3457 Others have made the promise. Will you?

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I ♻️ | WHAT CAN I RECYCLE?

TOP 10 IN THE BIN

1. CARDBOARD
2. PAPER
3. FOOD BOXES
4. MAIL
5. BEVERAGE CANS
6. FOOD CANS
7. GLASS BOTTLES
8. JARS (GLASS & PLASTIC)
9. JUGS
10. PLASTIC BOTTLES AND CAPS

ALSO RECYCLABLE BUT NOT IN CURBSIDE BIN

- PLASTIC BAGS AND WRAPS
- ELECTRONICS
- TEXTILES

Find out about your local recycling options here:  
[www.Iwanttoberecycled.org](http://www.Iwanttoberecycled.org)



# Sustainable recycling requires broad, multi-stakeholder support

Local recycling goals must be realistic. Policies and contract terms must support these goals.

Local regulations and our recycling contracts must be aligned to ensure the development of economically sustainable recycling programs

Sustainable recycling must include public education and outreach to support local regulations and economic realities

# The Circular Economy

