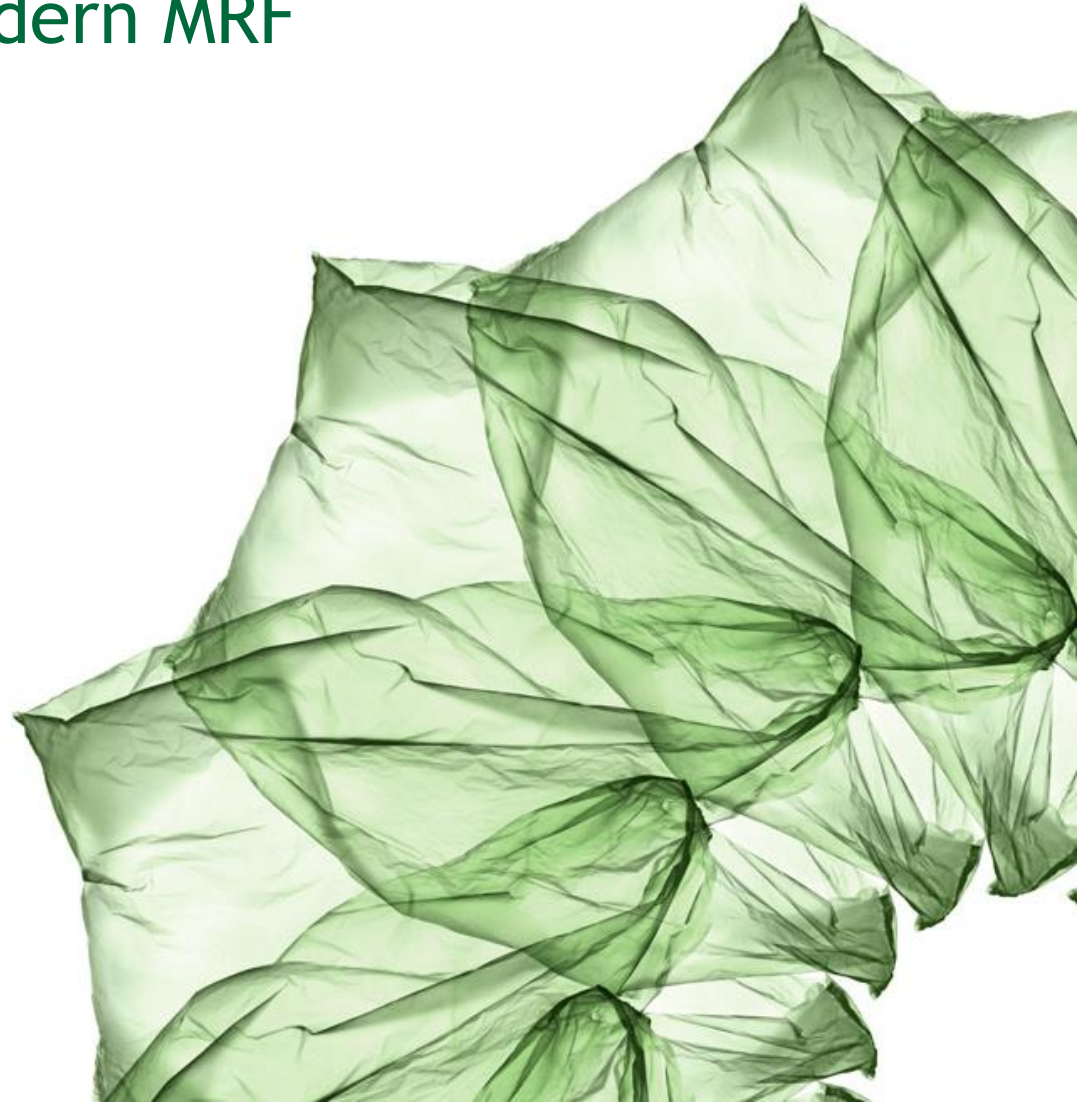


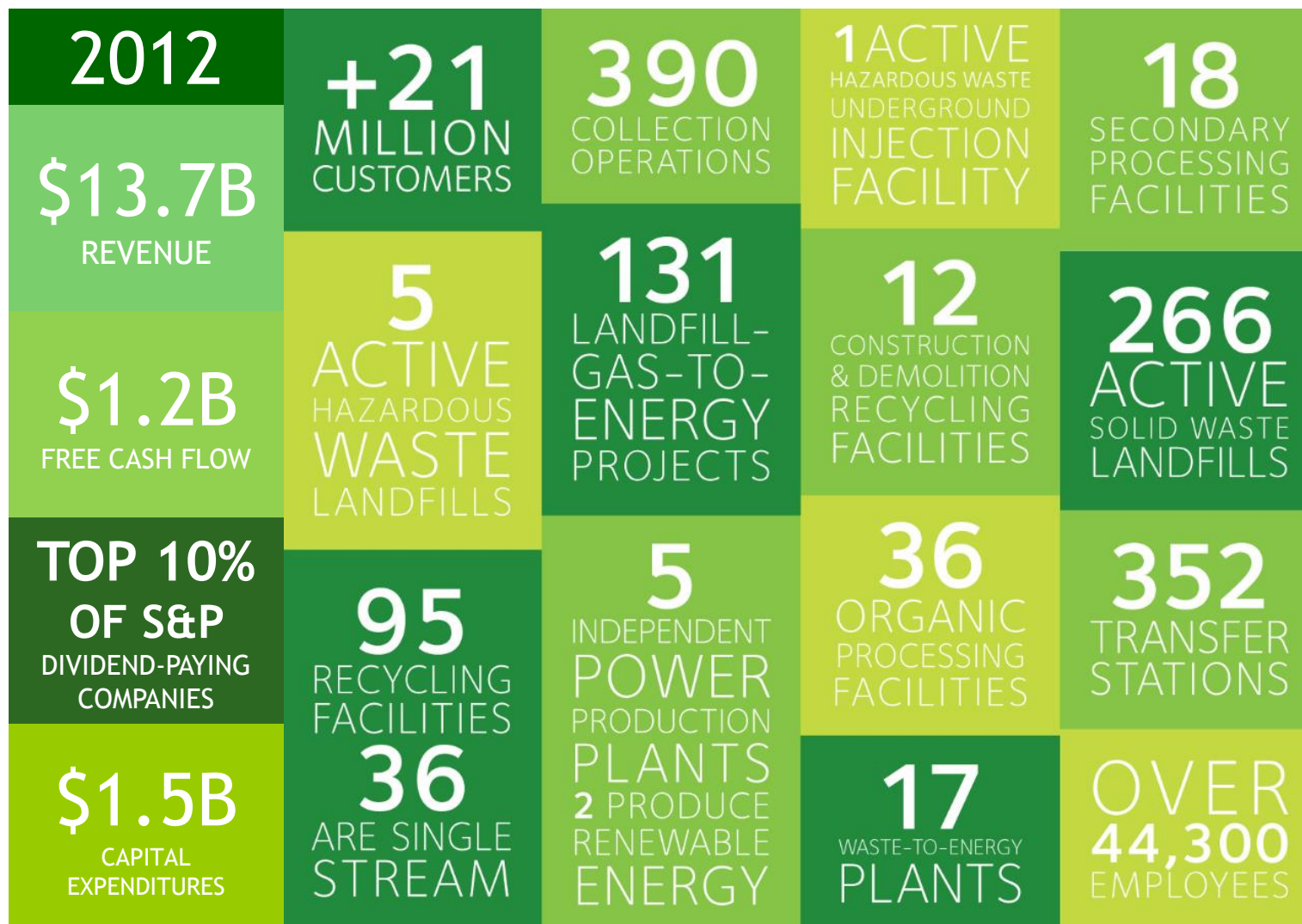
Recycling Markets- Looking Forward Perspective of the Modern MRF

Washington Council of
Governments

January 2014



Waste Management- service snap shot



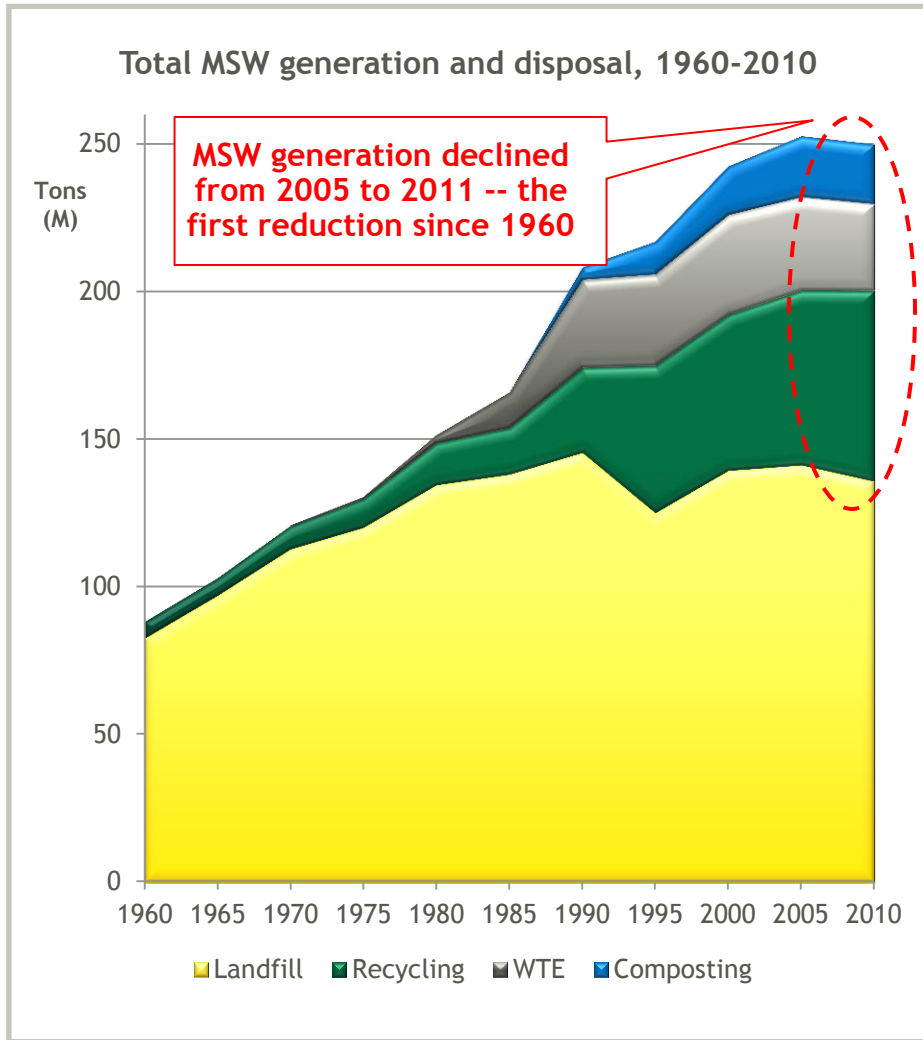
Overview: Recycling in the U.S. & at WM

Markets: Where does our material go?

Operation Green Fence and the future

Recycling continues to expand

Reduce/reuse/recycle rates holding, even during downturn



- U.S. waste bound for landfills has been declining since 2006 to less than 54% in 2011.
- 2011 EPA data shows a continued decline in overall MSW generation rates in the U.S. in 2011 to 250.4 million tpy.
- About 12% of MSW available for disposal goes to energy production.
- U.S. recycling rate has grown from 10% in 1980 to 34.7% in 2011.
- The per capita generation of waste in the U.S. is 4.4 lb/person - the lowest since the 1980's.

WM Recycling Services

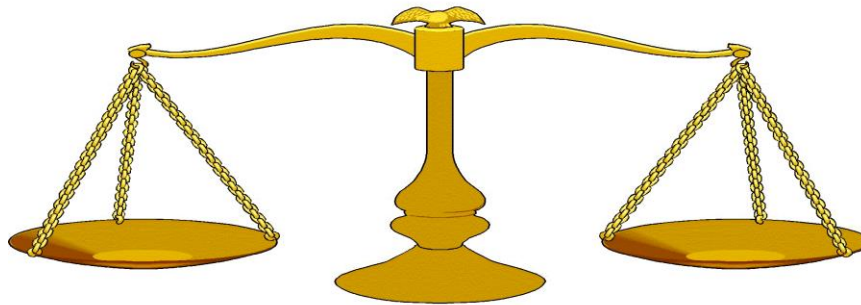
- WM handled almost 14 million tons of recyclables in 2012.
- WM handled more residential recyclables than any other company in North America
- 2013 acquisition of Greenstar, LLC added another 1.5 million tons of capacity, 12,000 customers and 12 MRFs (seven single-stream)
- The amount of material processed at our single-stream MRFs has tripled since 2002



Single-Stream technology continues to expand

- More inbound volume, more outbound volume
- Higher recycling rates -- easier to participate
- Access to all commodities - low-value and high-value

- More capital investment
- Higher contamination levels
- Higher operating and maintenance costs
- Material downgrades



More education, more
experience, more
knowledge can change
the balance

Changing market conditions - Paper

- Newspaper has historically made up 60% of recyclables collected. Newspaper plus other 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.
- North American mills have difficulty using low-grade **Curbside Mixed Paper** in their manufacturing process.
- New low cost manufacturing technology in China competes with aging North American machines so more Mixed Waste Paper goes to China.

The Changing Market Conditions- Plastics

- As paper grades have changed, plastics volumes are increasing
- Use of single serve containers and plastic packaging is up.
- Plastic bottles have “lightweighting” - water bottles take up the same space (volume) but weigh 25% less.
- More non-carbonated beverages are sold in the U.S. (lighter weight bottles than carbonated). Less soda sold.
- Changing waste stream means that we process more volume, less weight which means higher cost.

Impacts of the Changing Waste Stream

- MRFs have been built to process 80% fiber/20% containers.
- MRFs now receive 65% fiber/35% containers. Our equipment is not built for this mix.
- Changing waste stream means that we process more volume, less weight which means higher cost.

China's Green Fence coincides with these dramatic changes in the waste stream



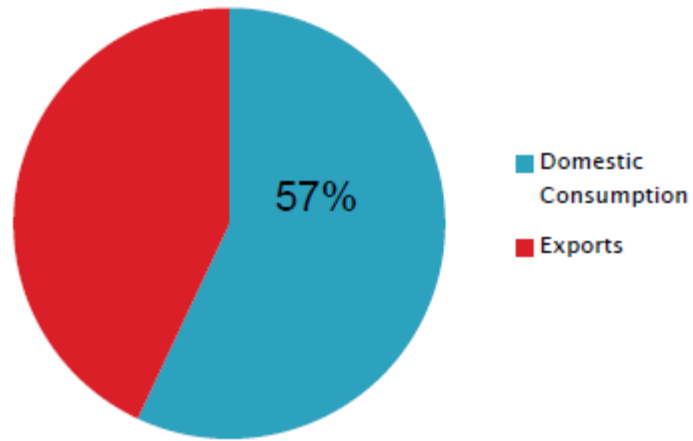
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Domestic and overseas markets both play important roles in the U.S. recycling industry

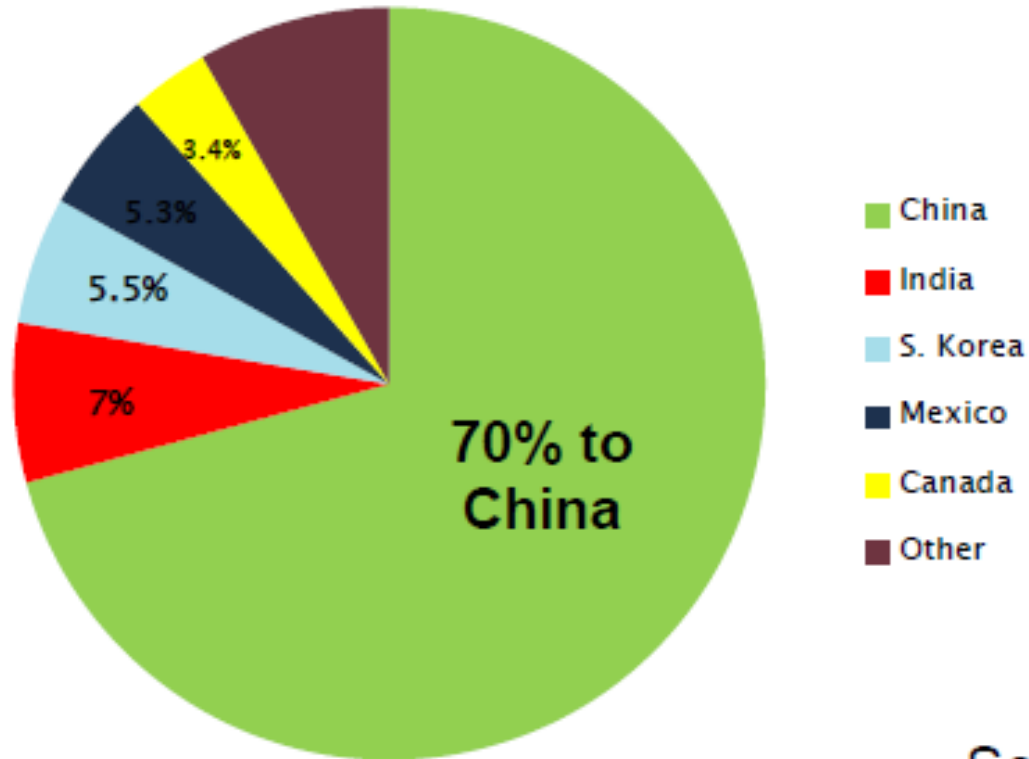
- 57% of the 51.4 million tons of paper collected for recycling were consumed domestically in 2012
- Domestic markets are primary market for natural HDPE plastic
- Virtually all mixed plastic bales, PC film and Mixed Rigid Plastics has been exported



U.S. Paper Markets

Year	Recovery Rate	(In Million tons)	Domestic Consumption (In mil tons)	Exports (In Mil tons)	Domestic Consumption
2012	64.30%	51.4	29.5	21.9	57.39%
2011	66.80%	53.6	30.5	23.1	56.90%
2010	63.50%	52.24	31.55	20.69	60.39%
2009	63.60%	50.16	29.16	21	58.13%
2008	57.70%	52.15	32.65	19.5	62.61%

Paper Export Market Destinations from U.S.



15.5 million tons (70%) of U.S. exported recovered paper went to China in 2012.

Source: RISI Estimates

Overview: Recycling in the U.S. & at WM

Markets: Where does our material go?

Markets: Current State, define responsibility

Waste Management MRF's

Market Challenges

- 2008/2009- Financial collapse- 6 months of pain
- 2010- the Roller Coaster
- 2011- a Good Year in the MRF Business, \$100 M spend
- 2012- a Not as Good a Year in the MRF Business
- 2013- a Complete Reversal in the MRF Business
- 2014- a Year of Analysis and Review

The Big Question
What Changed in the Market

The Market- Supply Chain Responsibility

Where does the market start and end?

- Starts at the CURB
- Transported via collection network
- Processed via a MRF of some sort (private, municipal)
- Outbound customer quality responsibility
- Long haul, full load transportation network
- End customer- material acceptance, financial process, material transformed to revenue, supply chain satisfied

Very simple supply chain, has worked for a century

The Market- Supply Chain Responsibility

Where does the market start and end?

- Starts at the CURB- bigger bins- higher residue- Pittsburgh Blue bag
- Transported via collection network-costs are up
- Processed via a MRF of some sort (private, municipal)- any MRF, on a cost per ton have rising costs
- Outbound customer quality responsibility- specs are more stringent than ever before- all grades
- Long haul, full load transportation network-costs are up
- End customer- material acceptance, financial process, material transformed to revenue, supply chain satisfied

Very simple supply chain, has worked for a century

MRF Matrix 2013

Peeling back the layers

- Pricing- 2012 to 2013- Y/O/Y- blended price similar
- Inbound quality- worse (higher residue rate)
- OPEX- up
- WEATHER !!
- Operation Green Fence- OGF

Run more volume, with higher costs, to throw out more, for similar revenue

What is “Operation Green Fence (OGF)”



- Started in February 2013
- Part of overall effort to reduce pollution in China
- Enforces existing regulations
- New Chinese government policy to vigorously inspect imports at customs as part of their
- Targeted materials includes paper and plastic grades, and some metals.
- Expected to run through November 2013 at a minimum.
- Coincides with high inventory created by low market demand tied to European economic downturn

Expected Long Term Impact of the “Green Fence”

- PET and HDPE plastics have sufficient markets and are not impacted by OGF
- Historically, the only market for mixed & low-grade plastics (No. 3-7, films, Mixed Rigid, ABS) has been China. We hope domestic markets will respond and develop for these materials.
- MRFs are increasing their processing to reduce the amount of non-recyclable plastics and other prohibitives.
- Many of these materials are part of curbside recycling programs across the U.S.
- Attention is focused on quality and pricing of these materials

The Future of our Industry: Quality over Quantity

- The U.S recycling industry must rely on both domestic and overseas markets.
- Pricing and quality are critical to keep U.S. recovered fibers competitive in the global market.
- We must all work to improve the overall quality of recyclables.
- OGF underscores the need for superior, customized public education programs, and community involvement
- OGF also puts the need for varied markets and market development for certain materials.

Summary

Where are we going?

- WM will continue to focus on convenient cart-based single stream recycling collection to grow recycling volumes
- We will be consider the types of materials collected, in order to ensure that recyclables have viable end markets
- The recycling industry will be required to make ongoing investments in processing technologies as the waste stream continues to change. This will require collaboration among many participants
- We all must commit to a renewed focus on market development for commodities that have poor end markets
- Investments in public education is paramount, as is collaboration among all participants for effective programs and enforcement support

Questions?



Thank you.