



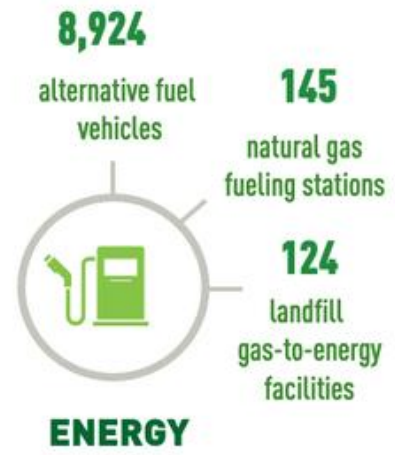
University of Guelph Circular Economy Workshop

Sustainable Materials: Innovating Our Future Beyond the Pandemic

Susan Robinson
Sr Director of Sustainability



WM Overview



2019 Recycling Performance

What We Recycled (Tons)

8,079,346 paper	3,577,122 mixed organics	1,149,000 fly ash	666,838 glass	476,645 metal
403,484 plastic	1,109,558 C&D/wood	39,594 wood pallets	9,110 e-waste/lamps	15,510,697 total materials recycled

Materials Recovery Facilities



Waste Management Organics Processing Sites

Waste Management is continually growing our capacity for processing organic material and making compost products available to local customers who can put them to good use. By partnering with stakeholders across the communities where our processing sites are located, we're all helping to maximize the value of organics.



Adapting to a changing world

Driving demand for post-consumer recycling

- Over the past several months, many consumers experienced firsthand the relationship between recycling and products/packaging
- The paper industry contacted their suppliers and regulators, making the connection between recyclables and the essential products required for the grocery and medical industries, as well as tissue and toweling products.
- Plastic demand has been muted during this time with relative little PCR used in primary packaging.
- The more products that rely on post-consumer PCR, the stronger the demand will be.



How can we use this opportunity to connect the dots for consumers ?

Driving demand for post-consumer use of recyclables in basic goods and packages will ensure strong recycling markets.

A resilient and adaptive industry

The industry has been adapting to China's recent policy changes. This helped with the respond to COVID-19 challenges:

- **Technology:** As global demand for recyclables fell, the need for improved quality and efficient processing became apparent. Subsequent investments in improved processing efficiencies have been unprecedented in our industry.
- **Markets:** Domestic demand has increased in response to the shift in global market conditions.
- **Education:** We've all learned how important it is to invest in recycling education. Collective industry efforts are making a difference.

Investments and adaptations by the recycling industry due to China's policy changes have created a more resilient industry that is able to operate effectively, and more efficiently within the safety protocols required by COVID-19

Technology investments

- At WM alone we've invested over \$100 M per year for the past few years
 - ✓ Four new MRFs since 2018
 - ✓ 20 MRFs upgraded
 - ✓ \$42M spent installing 96 new and upgraded optical sorters and robotics
- Chicago and Oakland MRFs opened in 2019. Salt Lake City, UT MRF opened last month, and Raleigh, NC MRF to open in Q4, 2020
- Expect more smaller scale investments in technologies that make existing MRFs more efficient over the next 1-2 years
- By 2023, 93% of our tons will be processed at MRFs with the most current processing technologies.

These investments support efficiency, quality & cost control

Markets

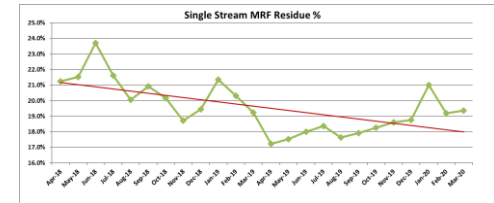
- We saw increased demand & improved pricing for paper and cardboard over the past few months
- North American mills needed domestic markets for post-consumer paper:
Pratt relies solely on post-consumer fiber; their mills cannot use virgin materials
- 80% of Waste Management's paper and cardboard is sold to North American markets, compared to 63% three years ago
- Waste Management is no longer exporting post-consumer residential plastics.



Recycling is essential since many of the mill in North America that use recycled fiber cannot use virgin pulp.

The role of product design & feedstock quality in circularity

- **Packaging design plays a critical role in the recycling supply chain to circularity.**
 - Association of Plastic Recyclers (APR) Design Guidelines
 - Sustainable Packaging Coalition's How2Recycle label
- **Recycling is part of the manufacturing process.** The quality of recyclables collected at the curb has a direct impact on recyclability at the MRF
- **Technology is being developed and used to educate customers, improving inbound quality**
 - Cart tagging and photos of recyclables being emptied into trucks
 - Onboard computers help communication with customers about the quality of their recyclables
- **With collective education efforts across the industry, inbound quality is improving**



Circularity and Demand: APR'S Demand Champion Program

- **APR approached Cascade Cart, KW Plastics and WM about using curbside plastics in recycling carts.** The timing was good because we needed more demand for rigid plastics resin.
- **This started a nine month process, including:**
 - ✓ Engaging our Purchasing Department/Supply Chain team:
 - ✓ Gaining brand approval from our marketing department for color
 - ✓ Testing by Cascade Cart for product warranties
 - ✓ Durability for impact
 - ✓ Heat/cold
 - ✓ Guarantee of price parity
 - ✓ Selling to WM teams who order their carts and to their communities

WM Eco Cart by Cascade Cart



Carts sold:	4,600
Cart ordered:	<u>7,000</u>
Total to date:	11,600

Overcoming Challenges: Importance of Purchasing Policies

- Having the purchasing department on board is imperative. Working through the details with them was critical.
- Overcoming inertia – change is hard. Started out slow with regional staff.
- We enlisted senior leaders to support purchase of carts once the warranties and pricing were confirmed.
- Education and advocacy focused on local teams and local communities.
- Ongoing support of Senior Leadership plays a role



Other Efforts and Next Steps

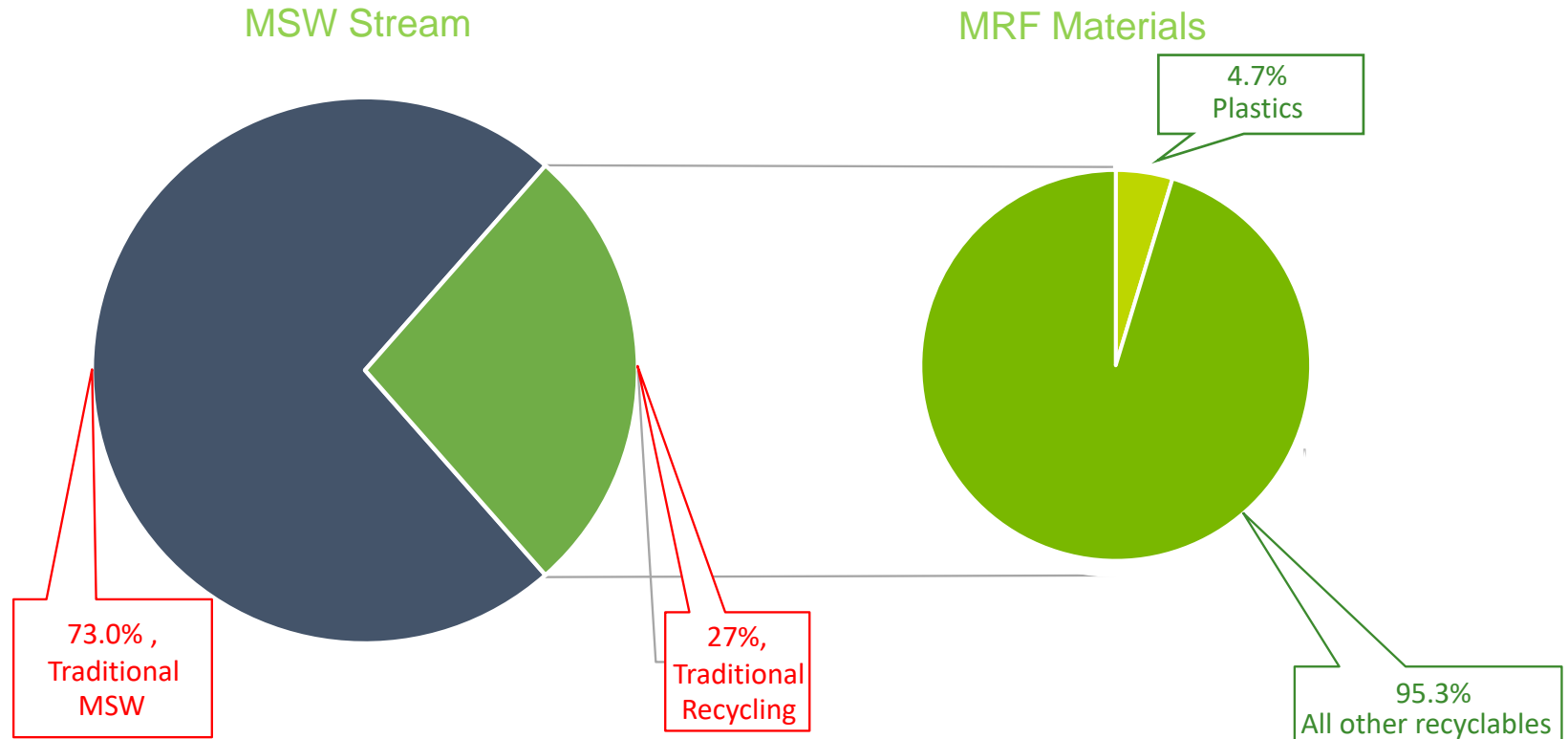
- Purchasing departments play a key role in creating opportunities to use post-consumer content.
- Policies requiring post-consumer content are gaining momentum



Purchasing departments – and consumers - play a critical role in driving demand

A Focus on Plastics

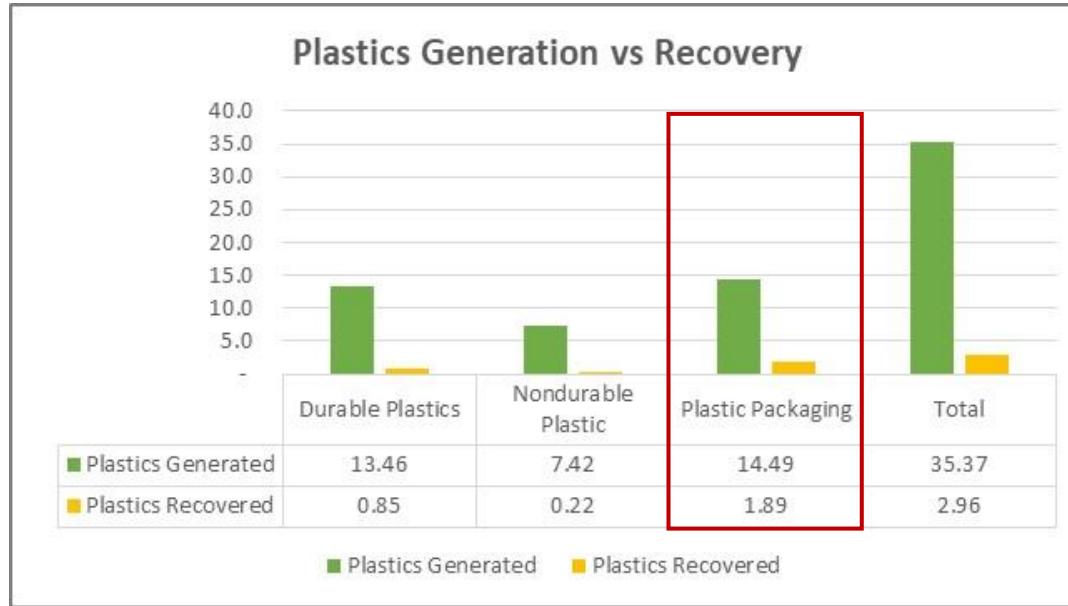
Plastics makes up a very small portion of overall tons



- Recyclables are 27% of the waste stream
- Plastic packaging is 5% of the total Waste Stream
- Plastics are 4.7% of the single stream recycling stream

Plastic recycling rate

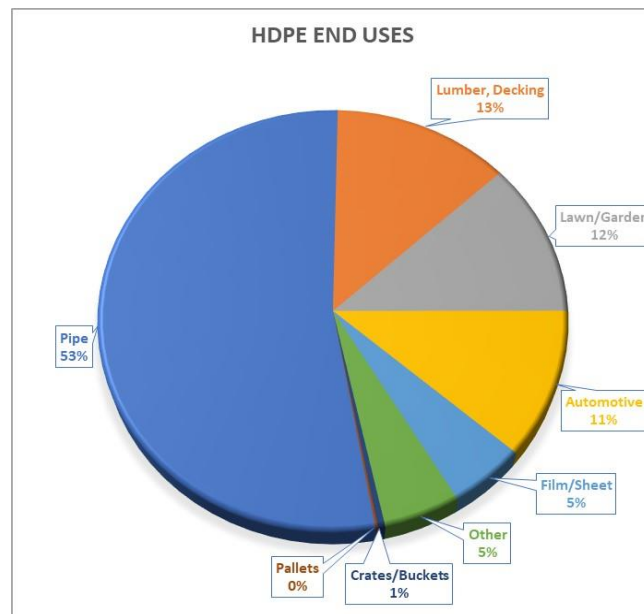
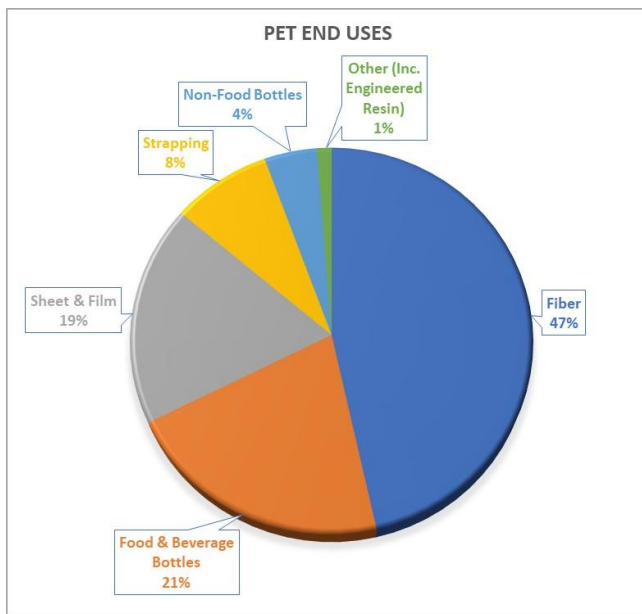
Understanding the World of Plastics



- Total plastic recycling calculates to 8.3% (includes durable items)
- Plastic Packaging Recycling Rate 13%
- PET and HDPE “bottle” recycling rate 30%

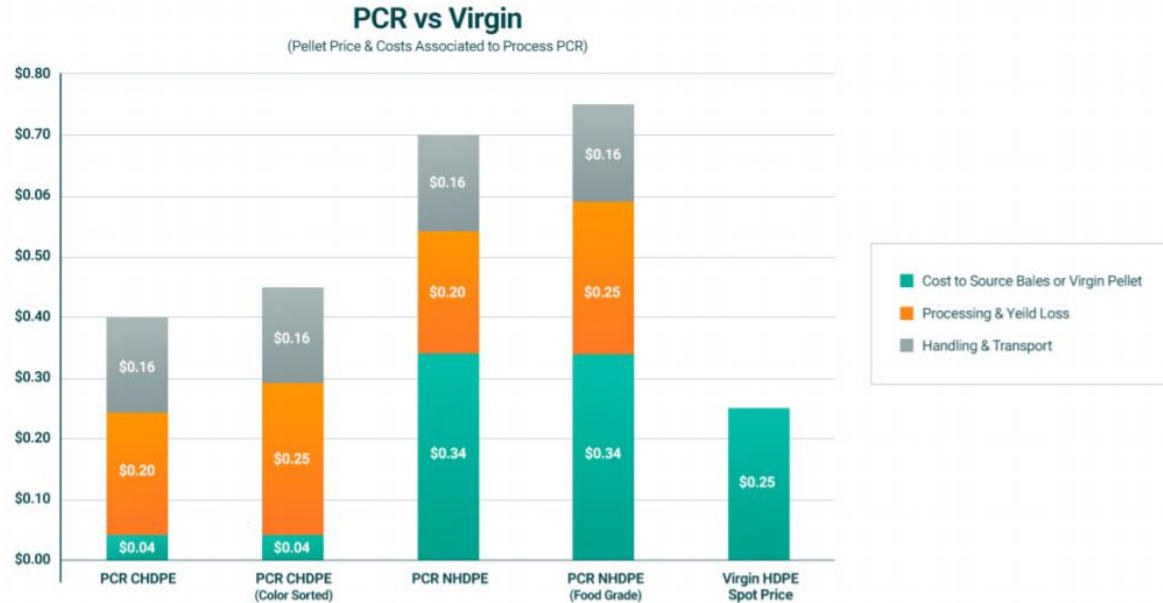
Recycled PET & HDPE End Uses

End markets for plastics



- Traditional end markets are carpet, textiles, piping and bottles
- These markets have been consistent buyers of recyclables

Virgin vs recycled plastic pricing



PCR CHDPE = Postconsumer Resin colored High Density Polyethylene

PCR NHDPE = Postconsumer Resin natural (colorless) High Density Polyethylene

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RECYCLING

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What does this all mean for the future recycling?

- **The global recycling industry is resilient, serving an important role in the manufacturing supply chain.**
- **Technology investments** must be ongoing along the entire supply chain to improve value and reduce costs.
- **Today's market reality has changed the rules for the short term.** We need to think and work collaboratively addressing the short and long term interests of our industry.
- **As the waste stream and global markets change, processing costs have increased while prices have decreased.** The value of MRF tons is 1/3 of the value from three years ago – while costs are more than 20% higher.
- **Additional end market demand is needed for recycling to grow**
- **Policies must consider the complex commodity marketplace tied to recycling to support circularity.**

