

# What's an ideal future state of MRFs in the U.S.?

## Accepted Materials at MRFs

- Collect and sort plastic (LLPDE) effectively.
- Accept all forms of fibers/paper-based products with and w/o polycoat & other material laminations.

## Equipment

- 100% of North American MRFs are updated/modernized with a high level of automation to handle current input materials.
- Renovation of older facilities.
- Investments made to **support the collection & processing of material where steady end-markets exist.**

## Accepted Formats

- Flexible and rigid materials (packaging).
- More types of packaging, including more complex structures and sort them into multiple streams.
- Items of all different sizes/shapes.
- Broad array of materials.

## Data

- MRFs are operated like advanced manufacturing facilities where real-time data can be easily captured.

## MRFs Ability to Sort/Recover

- Efficient sortation of a broad range of products across segments, **including packaging and textiles as priority segments.**

## Markets

- Sortation is tied to **viable end markets** that ensure value to MRFs, consumers & producers.
- Strong markets for MRF bales.
- Supportive end markets for a broad array of MRF materials.
- More transparency that some items can be sorted, but there may not be a market for them.

## Output from MRFs

- Yield losses for PET Bottles <5%
- Acceptable level of quality for outbound commodities (while maximizing recovery).
- **More consistency (in the inputs and outputs of MRFs?).**
- Fewer materials designated for landfill or not accepted.

## Design

- Material types are simplified through packaging redesign.
- Products should be designed to run efficiently at MRFs and not contaminate other streams.

# What advancements at MRFs are most needed to improve circularity at your business? (list in order of priority)/Provide any other comments – 1/2

Inputs to MRFs	Sorting Capability	Data	MRF Outputs/Supply Chain
<p>Ability to handle/process</p> <ul style="list-style-type: none"> <li>• wider scope of accepted mat'ls</li> <li>• challenging/ changing mat'l streams w/high variability</li> <li>• film and flexible packaging</li> <li>• food-contaminated packaging</li> <li>• Clamshells, small format packaging/colored packaging</li> <li>• consumer foil</li> <li>• product contamination</li> <li>• MRFs need to collaborate with designers and end-market providers for what is acceptable/ unacceptable.</li> <li>• MRFs need to be transparent with large brands about what is possible with new/updated equipment.</li> <li>• Lithium batteries and fire risk</li> </ul>	<p>Ability to effectively sort/bale</p> <ul style="list-style-type: none"> <li>• PET by color and product type (thermoforms/bottles)</li> <li>• lightweight bottles that are crushed into 2D-like shapes and misidentified.</li> <li>• plastic films</li> <li>• fiber packaging w/laminations &amp; polycoat</li> <li>• paper-based packaging through an extra sortation step that could then create a different bale type – separating mixed paper and coated paper</li> <li>• 3D fibers into fiber-based bales</li> <li>• fiber from both the fiber line and container line</li> <li>• paper products with food contamination</li> <li>• Different material types.</li> </ul>	<p>Data</p> <ul style="list-style-type: none"> <li>• MRFs need to be able collect and use data in real-time.</li> <li>• Consistent reporting on MRF outputs for sourcing planning.</li> <li>• Better input &amp; output data at the national level so brands can have better visibility on how their products are best being recycled.</li> </ul> <p>Investments</p> <ul style="list-style-type: none"> <li>• Additional investment in technology for hard-to-recycle materials (or where basic investments are needed).</li> <li>• Could systems like EPR encourage (vs. discourage) the collection of certain mat'ls? It would increase market demand and enable req'd investments.</li> </ul>	<p>MRF Outputs/Supply Chain</p> <ul style="list-style-type: none"> <li>• Limited non-targeted materials contamination of bales coming out of MRFs (contamination ↓)</li> <li>• Partnerships between MRFs &amp; advanced recycling outlets to manage non-acceptable mat'ls.</li> <li>• Decide if detailed sorting should be performed at MRFs or if facilities focused specifically on separating various types of plastic would be more effective.</li> <li>• Maybe MRFs are a place to locate pretreatment operations for UBCs/consumer foils (such as delacquers) to remove organic/food contamination at the earliest possible time in the process flow, minimizing the presence of rats.</li> </ul>

# What advancements at MRFs are most needed to improve circularity at your business? (list in order of priority)/Provide any other comments – 2/2

## Markets

- We need stronger/secure end-markets so that PCR is more widely available.
- More stability and development of end markets
- The low commodity value of materials and uncertain markets are a real hazard with MRFs.
- Without consistent end markets, there is no point in collecting and sorting materials separately.
- Brands are unwilling to pay for materials sorted at MRFs. Adding more equipment will make them even more costly. Why sort if no one will use the MRF output to make new products?