

Determining Material, Environmental and Economic Efficiency of Sorting and Recycling Mixed Flexible Packaging and Plastic Wrap – American Chemistry Council, Resource Recycling Systems, Idaho National Lab

Node Alignment: Recycling & Recovery

Project Type: Full

- In the near future, flexible packaging and plastic wraps will be a dominant form of packaging in the U.S. Less industrial uses, approximately 12 billion lbs. of this material are introduced to the U.S. market each year – 2X the size of the U.S. PET market. As of 2015, only about 209 million lbs. or 1% of plastic films, bags, and wraps were collected for postconsumer recycling, mostly through drop-off. The remainder is landfilled or lost to the environment as litter.
- Several technical and economic barriers exist to the wide-scale recovery of flexible films and plastic wraps at the post-consumer level. In a material recovery facility (MRF), the lightweight and flexible nature of this packaging prevents it from being manually sorted in a cost-effective way. Flexible films create costly contamination in MRFs because proper equipment is not in place to efficiently capture them. They are present today in the inbound stream to MRFs at up to 15%-20% on a volume basis. Flexibles are contaminating paper product bales, in turn presenting a serious and growing problem for paper manufacturers. Optical sortation of flexible films and plastic wraps also faces technical challenges in detection and ejection of the material, due to the physical characteristics of the material. Once the material is sorted into a recovered flexible (rFlex) bale, further technical and economic barriers exist in reprocessing the material. These barriers include the need for further processing to prepare it for reclaiming.
- REMADE Technical Performance Metrics (TPMs) Being Addressed:
 - Achieving cost parity for secondary materials
 - Reducing primary feedstock consumption and increasing secondary by 30%.
 - Develop manufacturing processes that enable cross-industry reuse of recycled feedstock (both plastics & fiber).
- Technology/Knowledge Gaps Being Addressed:
 - In the rFlex bale production process at the MRF, data documented the efficacy of the proposed technical sortation equipment, its performance level once installed in a real-world setting, and the impacts on MRF operations and the quality of other commodities produced by the MRF is not available.
 - In the end market phase, data on the material efficiency, environmental efficacy & market potential from the MRF is not available