



## TECH 2021S10: Material Recovery Facilities for Plastic Waste

**Material Recovery Facilities for Plastic Waste is one in a series of reports published as part of NexantECA's 2021 Technoeconomics – Energy & Chemicals (TECH) program.**

### Overview

Plastic waste is a highly sensitive topic due to the number of stakeholders involved, and in the last decade there has been an increasing awareness of its impact. Plastic waste is now at the center of one of the fastest growing global environmental campaigns. As such, consumer and investor perceptions are being increasing driven by the changing opinion on plastic waste.

The greatest contributor to waste plastics is post-consumer MSW (Municipal Solid Waste), which accounted for about 242 million tons of plastic waste in 2016. MSW is therefore the single most important waste stream to consider in tackling the issues associated with waste plastics.

Currently, issues with the MSW management systems are preventing increases in plastic recycling and MSW recycling. These challenges significantly impact the processes and infrastructure of waste sortation facilities. These facilities, referred to as Material Recovery Facilities (MRFs) play an integral role in the recycling process, acting as an intermediate processing step between the collection of MSW and the sale of recyclable materials to end-user manufacturers. It is important to understand MRFs for the following reasons:

- To determine the waste plastics available for recycling and in what quantities.
- To understand the contamination level of waste plastics available for recycling.
- To recognize the current limitations that prevent the development in the level of plastics recycling.
- To understand how developing the collection and separation of MSW will impact availability of plastics and plastic types for recycling.

This report is therefore focused on MRFs for plastic waste.

### Commercial Technologies

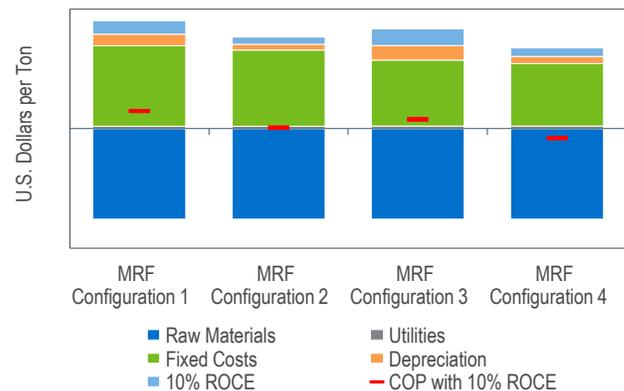
This TECH report focuses on the sortation process to remove plastic waste and other materials from the MSW stream. These sorting technologies remove contaminants and separate the waste stream first into fractions based on material shape, before being further separated into

their constituent materials by grade. The resultant dry streams containing paper, cardboard, plastics, and metals are collected and often compacted for transportation to downstream customers. This report focuses on the following sorting technologies to obtain plastic wastes:

- Feeders
- Screening technologies
- Air separation techniques
- Electromagnetic separation
- Eddy currents
- Optical sorting, including Artificial Intelligence
- Balers

### Process Economics

Detailed cost of production estimates for the sortation of a dry-mixed recyclable waste stream at various facility configurations are presented for USGC and Western Europe. Estimates are developed with sorted waste plastics being the targeted products.



### Commercial Overview

The report provides an overview and profiles of the major suppliers for MRF sorting equipment as well as a summary of recent developments in plastics recycling. Profiles of major MRFs operators is summarized for the U.S., Western Europe and Asia Pacific.

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