Infrastructure, Economics & Sustainability Considerations for MSW into Viable Products

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Agenda

1. Purpose of Discussion
2. Infrastructure Requirements
3. Cost
4. Environmental Considerations

Cost

01.

Feedstock Acquisition Cost & Transportation

Do you have to buy the Feedstock? Who are you competing with?

What does it cost to have the material delivered to the pre-processing facility and for further processing

02.

Facility Build & Ongoing Maintenance

$8-$70M to build a complex pre-processing facility.

03.

Residue

Transport & Disposal of residue left over from processing

$40-$100+ p/ton depending on location

10-75%+ of input (thousands of tons)

Environmental & Social Considerations

Energy & Water Consumption

GHG emissions associated with transportation; processing; product development, etc.

Is any water being used after pre-processing or in product development?

Chemicals & Emissions

Are any chemical processes being used in the product development?

Are their other emissions or pollutants to consider?

End of Life

What happens to the new product at EOL?

Environmental Justice

Who's backyard are these projects occurring in?

Who, how, what may be impacted?

Collection – The Pathway to Recovery

MSW

Municipal Solid Waste

MRF or Processor Residue

MRF Residues

Source Separated Waste

Single Category of Materials Collected (i.e. organics, polystyrene, carpet, etc.)

Pre-Processing MSW

- Infrastructure
  - -Equipment, Footprint, Separation,
  - -Volume
  - -Maintenance - Staff
- Oakland Mixed Materials MRF
  - MSW > Recyclables + Organics
  - 100 TPH
  - Cross-Contamination; Product Losses; Downtime
- Advanced Facility
  - Shredders, Bag Breakers, Screens, Opticals, Magnets, Eddy Current, Bunkers
  - Can’s shred into tiny materials
  - Flexible Film is an issue

Understanding Facility Required

Pre-Processing MSW

- Shredding
  - -can’t shred too small,
  - -need to identify material types
  - -AI and/or optical sorters can’t see/sort out of a big pile
- Recovering Unrecyclable Plastics
  - Issue: Flexible Film Plastics are an issue
  - MRFF Study film plastic out of paper only recovered 74%
- Maintenance & Every day operations
  - Residue – Transport & Disposal

But these are just the steps you need to separate your material out of the MSW…

Pre-Processing MSW – Cont'd

Additional Steps Required

Transportation

Transport material for further processing into usable material

Mechanical Processes

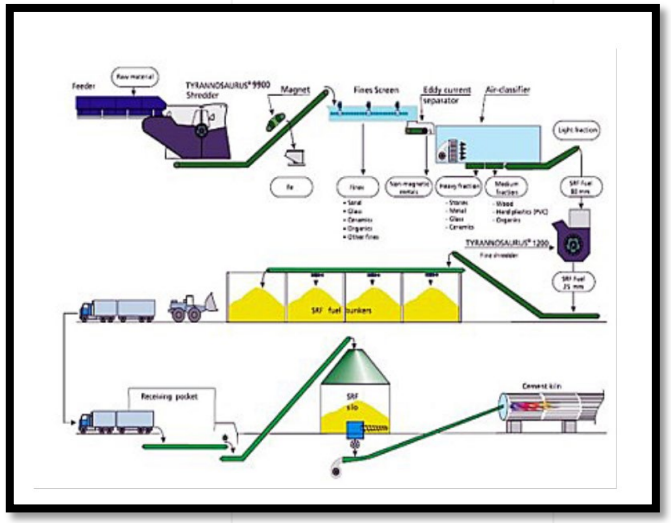
Shredding, screening, air classification, decontamination, drying, grinding, fractionation, pellitization, etc.

Chemical Processes

Chemicals, reaction & stabilization processes, catalysts, dyes, etc.

Pre-Processing MRF or Processor Residue

Considerations



- Similar to facility requirements for processing MSW
- Won't require the same amount of throughput ~1/5
- Understand pre-sort vs processed residue 'piles'
- Audit the Residue to understand composition

- Titan >> MRF Residue to Make Fuel >> Ash >>Cement
- Additional Processing Required (Shredder, Magnets, Opticals, etc. >> no PVC)

- MRF Plastic Residue Misconception
- MRFs recover materials of value
- MRFs need a bunker for any material recovered
- Low volume of Mixed Plastics

- Unrecyclable plastics in MRFs disbursed
- Unrecyclable plastics in MSW

Source – Source Separated Wastes

- Collect target material via a source separated process
- Will still require some amount of cleanup but will likely require a much less complex process; smaller footprint; fewer types of equipment needed, etc.
- Won’t generate as much residue or waste.

High volume commercial wastes, i.e. carpet, polystyrene, medical packaging, Hefty® EnergyBag® Program

Important note : neither I nor do most in the Recycling Industry supports the Hefty EnergyBag Program as it is designed to be put in the recycling. If this material could be collected separately at the curb and NOT as part of the recycling it would be a great initiative and would truly work to help solve the plastic problem.

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Thank you!

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