

Final Problem Statements:

Size/Shape

The screens (star, trommel, shaker) within a MRF are currently designed to separate small plastic items and direct them to waste. It is very rare for a small format package to make it through a screen and end up in a plastic reclaiming facility. Small format unfortunately becomes collateral in the bigger recycling picture.

Material (Current Packaging)

Small format plastic packaging, along with larger plastic refuse, are made of 7 various types of resin, of which Polyethylene terephthalate, High-density polyethylene, Polypropylene, and Polystyrene are commonly recycled. This makes characterizing, sorting and processing more difficult due to mis-labeling, mis-sorting, and degradation. In addition, refuse made of multiple materials, both plastic and non-plastic further complicates the process.

Relationship between MRF and Producer

There is currently little to no relationship between a MRF and the producer of small format packaging. The Association of Plastic Recyclers has a "Size Sorting Potential Test" which measures how well a product will be sorted by the screens within an MRF. Poor results indicate that the product design needs to be improved, and hence a strong relationship between an MRF and producers is needed.

If we find ideas that do not fit any problem statement then reverse the process and see well what problem does it solve? Would that be something interesting to look into?

Project Statement 1 - MRF Adaptation

Consumer Insight: MRF's currently cannot detect small format packaging because they are too small. This was discovered through background research on the issue of small format packaging. Since small format is defined as items that are smaller than 3" in all dimensions, they either fly off the belts in a MRF or simply are not detected and hence cannot be recycled.

Area of Opportunity: If we fix the MRF's to detect small packaging then more of the packaging will be recycled. This would be a big Opportunity because so far the MRF's can't detect the packaging. Which will lead to less waste into the landfill and more of the packaging in the recycling.

Statement: We want to address the issue of small format recycling inside the MRF. We plan to change the current system within MRF's to be safer, more efficient, and environmentally friendly.

Justification: If items cannot be recycled in a MRF, they end up in a landfill where they cannot biodegrade and hence give off greenhouse gases which pollute the environment. This is important to explore because the future of the Earth depends on how sustainable we are now, and how well we treat the environment. We define a safer MRF system as a system that has a safe production and recycling system creating a safe end product.

Statement 1: We want to improve the current MRF systems by adding another attachment. The attachment would address the recycling of small packaging plastic.

Project Statement 2 - Current MRF Improvement

Statement 2: We want to improve the current MRF systems by changing the existing system. The changes would improve small packaging plastic recycling.

Project Statement 3 - MRF Redesign

Statement 3: We want to completely redesign the MRF system to fully recycle small format and large format materials.

Project Statement 4 - Current Packaging Shape

Consumer Insight: Curbside programs are currently unable to recycle materials that are not at least 60% recyclable. Hence these materials are thrown away and end up in landfills. This was discovered in an interview with the Sustainability Consortium, and through research on this topic. Companies are switching to decomposable materials; however, not everyone has access to a composting program. Current recycling exchange programs are currently not that successful.

Area of Opportunity: To make more packaging recyclable in compliance with curbside can make it more likely to be recycled by the curbside program. Meaning that there will be less waste ending up in the landfill. Also there is an opportunity to change current recycling programs to take more materials than they already do to put more packaging into the recycling and not the landfill.

Statement: We plan to address the current issue associated with packaging of materials. Specifically, the shapes and materials used, creating an universal implementation.

Justification: With more Materials ending up in landfills when they could be recycled leads to bigger landfills and more pollution. It is important that we find ways to recycle more of the materials that we use in a day to day so we have less landfills and less pollution on the planet. It is also important to use less virgin material and transition towards more sustainable products that can be reused. Current systems with Nespresso have not been successful, and thus would be an important problem to solve. There is a lack of attention placed on these programs.

Statement 3: We plan to change the materials used in the current plastic packaging to improve recycling within the already existing MRF.

Statement 4: We want to address the problem with the shapes of small packaging plastic in order to avoid the 3" minimum size to make packaging recyclable.