



The Materials Recovery for the Future (MRFF) pilot program is researching ways to recycle flexible plastic packaging.

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Thinking flexibly

Pennsylvania-based J.P. Mascaro's TotalRecycle facility is starting to recycle flexibles this fall as part of the Materials Recovery for the Future (MRFF) pilot program.



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Plastics

Low-density polyethylene (LDPE) is about two times more prevalent in packaging materials than polyethylene terephthalate (PET), according to Susan Graff, principal and vice president of global corporate sustainability at [Resource Recycling Systems](#) (RRS), Ann Arbor, Michigan. She says the U.S. generates about 12 million pounds of flexible plastics per year.

However, LDPE faces more challenges than PET in terms of its recyclability.

“Right now, the markets are telling us that this material doesn't have value,” Graff says. “However, we know in other parts of the world, like Europe and Australia, there are companies using this material to make all kinds of building materials and infrastructure materials. So, we know this material has value to those markets. It's just in the U.S., where we were really dependent on China forever, now since China's market has disappeared, we don't have the domestic markets to say we want this material.”

Graff says this begs the question: If flexible plastics are so popular as a packaging product, how can companies ensure they can be recycled to make more useful products?

That's the question that prompted the **American Chemistry Council**, Washington, to launch the **Materials Recovery for the Future (MRFF)** initiative a few years ago to research the recyclability of flexible plastic packaging.

The perfect MRF

From 2015 to 2016, RRS researched whether flexible plastic packaging could be separated in residential single-stream recycling facilities for the MRFF initiative. The researchers concluded that existing optical sorting and material recovery facility (MRF) separating technology can be used to effectively and efficiently sort flexible plastic packaging in single-stream recycling.

With this knowledge, the MRFF team decided to partner with a MRF to perform a pilot study on capturing flexible plastic packaging in single-stream recycling. To find the right MRF for the job, Graff says the MRFF team screened many MRFs based on several factors, including the size, age, degree of automation and the readiness of the MRF's management team.

Graff says not many MRFs are designed to handle flexible plastic packaging. She notes that many MRFs are "processing 2019 tons using 2012 technology" and are in strict contracts with municipalities. She adds that some MRFs are "hamstrung to innovate" as a result of their contracts and wouldn't work as candidates for this project.

"We wanted innovators who were looking to figure out how to adapt to the evolving ton," she says.

About two years ago, **J.P. Mascaro & Sons**, Audubon, Pennsylvania, learned about the MRFF initiative. Joseph Paul Mascaro Sr., director of TotalRecycle at J.P. Mascaro & Sons, says he thought the company's TotalRecycle MRF in Exeter Township, Pennsylvania, would be a great fit for the pilot project, so he reached out to Graff to nominate his MRF.

"I picked up an article [on the MRFF initiative] and it seemed like we were the type of facility they were looking for," Mascaro says. "It basically said they wanted a 35-ton-per-hour MRF that was willing to combat an issue in the industry."



The MRFF initiative selected the TotalRecycle MRF for its pilot program. Graff says the TotalRecycle MRF fit the goal of the pilot project really well because it's a "large, high-speed and automated MRF."

"Those are the most scalable with regard to accelerating the capture of this material," she says. "They had this culture of innovation; they had a new MRF. Their customers wanted to recycle materials that could be potentially used for products in domestic manufacturing. And they see where they can be economically successful with this."

The TotalRecycle MRF opened in January 2016, and it handles about 12,000 tons of material per month at full capacity. Mascaro adds that he also had an interest in trying to recover flexible plastic packaging to make what

he calls "rFlex" bales.

"We were trying to be proactive," he says. "Once I spoke to RRS and to Susan, I realized that we would be stupid to not try to move forward with [the MRFF pilot]. It's a very noble cause and it's the right thing to do. It's a very different way of going about recycling."

Graff adds that the TotalRecycle MRF also had the right company culture for this project. "What we found at J.P. Mascaro & Sons was a culture of innovation," she says. "Projects don't just work because of machinery; they work because of the people involved."

Getting ready for flexibles

Before getting involved with the MRFF pilot project, the TotalRecycle facility featured four optical sorters as well as antiwrap screens. The company had to add four more optical sorters upon starting the MRFF pilot program, though. **Van Dyk Recycling Solutions**, Norwalk, Connecticut, installed the four optical sorters from Tomra, Norway, as well as a Lubo 440 antiwrap screens at the TotalRecycle facility. Mascaro says the company is using optical sorters on its paper lines to sort out flexibles from fibers.

Graff adds that other peripheral equipment and systems were integrated to make sure the facility could properly recycle film plastics. The MRFF team negotiated a grant memorandum of agreement so that members of the pilot project's value chain—brands, retailers and trade associations—could co-invest with J.P. Mascaro to pay for this new equipment for the MRFF pilot program.

J.P. Mascaro finished equipment installations for this project in February. Although the company didn't formally start collecting film plastics from community members until this fall, it did test the machines to see how they handled film plastic already seeping into the recycling stream.

"About 1 percent of our stream is [film] plastics," Mascaro says. "We had enough of it to tune our equipment."

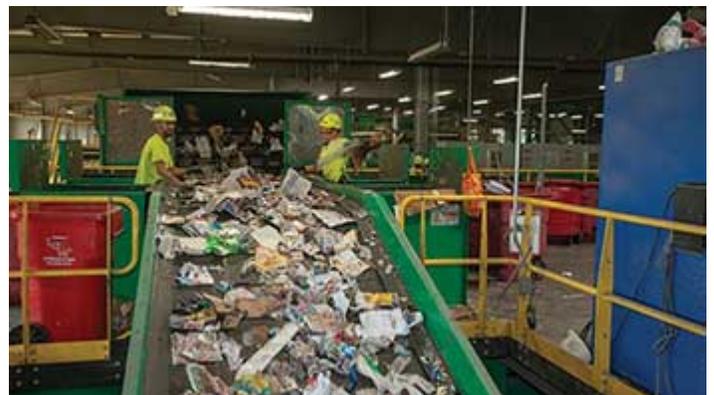
Since starting to test equipment to recycle film plastics, Mascaro says he and his team have had to focus on ensuring material spreads out better on belts so that optical sorters can perform better.

Mascaro adds that he has also had to communicate changes to the material stream clearly to employees. "You're telling workers, 'Hey, remember that thing you picked out in mass quantity every day? Let [plastic film] go. It's not a problem anymore,'" he says.

However, Mascaro says employees were generally excited to hear that they wouldn't need to worry about picking out plastic bags anymore. He says it has also been exciting to have MRFF initiative partners like PepsiCo and other companies visit the TotalRecycle facility in recent months.

This fall, the TotalRecycle **officially began collecting film plastics** to recycle from the city of Pottstown, Pennsylvania. The company chose Pottstown as its first community for film plastics collection because of its proximity to the TotalRecycle facility and because it met other project requirements, such as curbside recyclables being collected in wheeled carts.

Mascaro will begin collecting flexible plastic packaging curbside this fall. As part of the lead up to the program, the company is notifying residents of the types of flexible plastic packaging that can be collected for recycling.



J.P. Mascaro & Sons

J.P. Mascaro & Sons opened its material recovery facility (MRF) in Exeter Township, Pennsylvania, in 2016.

Mascaro says several communities the company serves has been interested in the MRFF pilot project and recycling flexibles, but he adds that J.P. Mascaro is taking a tiered approach with rolling this capability out to other communities gradually. Earlier this year, the company met with more than 100 local community coordinators in February to educate them on the MRFF pilot and plans to roll it out.

"That had a great response," Graff says of the meeting with community coordinators. "J.P. is a fourth-generation member of the company and is known in his community, so he had a huge turnout in February. In April, they had an end-market showcase with a dozen or so end-market manufacturers and intermediary processors who could evaluate the material, sign up to get test material when J.P. Mascaro's bales are ready and then bid on procuring the material."

Graff adds that everyone involved on the MRFF pilot project has been working as quickly as possible to find a solution to recycle flexibles, but she says it's more important that everything is thoroughly tested.

“We want to address challenges like moisture and use of peripheral equipment to make sure everything is just right before we leave J.P. Mascaro to successfully move forward with this on its own,” she says.

J.P. Mascaro has committed to participating in the MRFF initiative for at least 24 months, but Mascaro says he wants to keep working on this project—even if it takes longer—to make sure it’s perfected. He and others on the MRFF pilot program hope to prove the feasibility of recycling flexibles so that other MRFs across the U.S. may implement similar models in the future.

“This project should be a successful demonstration on a way to clean up fiber streams and gain a new commodity, which is flexibles,” he says. “We’re cleaning up fiber lines, creating a new commodity and lowering our residue rate. Those are wins for MRFs.

“It’s been really exciting and a privilege to work with this consortium,” he continues. “This is a revolutionary project, but it’s a lot of work. We are trying our best to help accomplish a significant goal.”

The company adds that it hopes the pilot program will generate data to show interested municipalities that flexible plastic packaging recycling is possible and economical and that there is a market for rFlex bales.

For a video about the MRFF pilot project, [click here](#).