**Postconsumer recycling: It takes a village**

By Kari Embree  
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It’s lightweight, durable and most importantly, it costs hardly anything, which is why plastic plays such an integral part in a variety of packaging solutions. After all, a wide range of plastics are highly adaptable and can be molded, extruded, blown and cast into a variety of shapes, film or foams.

Also, another advantage is the ability to take more product home with less packaging compared to alternative materials. As a result, minimal resources are needed, which helps cut back on waste. However, as technology continues to evolve with new polymers popping up in the market, demand increases…and so do recovery efforts.

Every year 280 million tons of plastic are produced globally, yet, estimates point out that only 10% each year is actually recycled, according to the Plasticity Forum, a collaboration of Ocean Recovery Alliance and the Republic of Everyone, which presents ideas and opens up discussions on how to harness this material in new ways, both pre- and postconsumer use.

More often than not, plastic packaging finds its way into our oceans, streets and landfills. This is one of the main reasons why plastic is so often portrayed in a negative light. Contributing to this waste stream is a growing population across the world. Emerging economies, such as China, India and Brazil, are developing a burgeoning middle class. This means more disposable income, which sparks consumer demand for products that were previously unattainable, and more waste.
“Like aluminum and paper, plastics are a resource. If we are able to expand end-of-life management opportunities for a broader range of plastics in a way that puts those items to a higher and better use than landfill, people will begin to think differently about this material,” said Kim Holmes, Senior Director of Recycling and Diversion, SPI.

“We don’t have a system yet that really allows us to tap into that value and utilize end-of-life plastics to their fullest potential. That’s the goal of all of our current efforts in recycling: To demonstrate the technical and economic recovery of plastics, whether that be for mechanical recycling, or recovery of chemical or energy value.”

So, how do we go about solving our plastic pollution problem? We need to get better at getting the material we use back after we’re done with it.

**Postconsumer recycling**

Postconsumer recycling (PCR) is the method whereby plastics that have served their intended use have been diverted or recovered from the waste stream.

Afterwards, closed-loop systems recycle a single type of plastic into the same production process, while open-loop systems make these materials available for other applications. Then, the process is broken down to either melting and refining without breaking down the polymer, or breaking the polymer chain down to its chemical building blocks and reusing them to produce a new polymer.

While this is a great solution for tapping into the waste stream and eliminating the need for virgin plastics, it’s not without its challenges.

“The first thing to realize is that the existing materials recovery facility (MRF) infrastructure was designed to recover a much different recycling stream than what we see today—more paper and less plastic packaging. As a result, many of these facilities do not have the capabilities to efficiently sort the myriad plastic packaging in the market today,” said Tim Goodman, Cradle-to-Cradle Manager, NatureWorks (Minnetonka, MN).

“While they do an adequate job of sorting out PET and HDPE plastic bottles and jugs, they are not equipped to sort the variable sizes, shapes and multimaterial plastic packaging that is now part of the recycling stream. Along with trash and other items, which should not be in the recycling cart,
these materials overwhelm the capabilities of the equipment, resulting in contamination of recovered materials of all types as well as the oversight of recyclable materials that end up in the residual stream,” said Goodman.

Another big hurdle for the PCR industry is packaging innovation.

“We are going to see packaging continue to evolve to meet the needs of consumers to better protect products and achieve reduced overall environmental footprints. These changes can, at times, present challenges for recyclers when new materials are introduced,” said Holmes.

“What I think we are seeing today, however, is a concerted effort on the part of packaging manufacturers to work with the recycling community to address the impacts those changes may have on recycling systems. These material suppliers and processors are getting involved in evaluating processes, technologies and additives that can expand recovery opportunities for the products that don’t seem to fit in the current recycling infrastructure. You are seeing the entire supply chain getting involved in the recovery discussion, which greatly increases our likelihood of solving these challenges,” Holmes added.

Collaboration is key

The plastic pollution issue at hand cannot be solved by just one party. Collaboration between government, the plastics industry and consumers is imperative for PCR to be successful.

“I think the supply chain collaboration that is happening to address end-of-life challenges is key, and I think the formation of the Recycling Committee within SPI is a demonstration of the industry creating that collaborative model,” said Holmes.

“In this committee, we have recyclers, resin suppliers, equipment makers, processors and brand owners all working together on end-of-life issues. In the past, I think all parties generally took a siloed approach to improving recycling. I think we’ve seen that only got us so far and it really is going to take collaboration to get us past where we are at today.”

“In addition to the supply chain collaboration that is happening, I think we are also seeing increased communication and collaboration happening between different trade associations and non-profit groups, as well. Many of us have shared goals and specific areas of expertise. When we bring those things together, we get much farther much more quickly,” Holmes added.

Trending now
According to Goodman, there are a couple trends right now, which are helping to improve recovery efforts.

First, sorting equipment is becoming more sophisticated and fine-tuned to help improve the recovery of postconsumer packaging. One example of this is the advances in optical sorting technology, which allows equipment to identify a wider array of material with greater accuracy. As MRFs begin to modernize this equipment, it will allow them to recover more varied materials with better recovery rates. Currently, there are still MRFs in the United States that operate without optical sorting equipment.

“If we can improve the MRF, we can improve the quality of bales, which helps the overall economics and efficiency of recycling further down the value chain,” said Holmes. “In return for making investments in better equipment, MRFs will see a financial return, too, as their efficiency and output increase.”

Another trend is the growth of secondary processing to recover recyclables that were missed by the first MRF or to recover packaging that might not be cost effective for the first MRF to recover because of lower volumes.

Secondary processing can take the form of recovering plastic packaging from mixed plastic bales sent to plastics recovery facilities or, in some cases, recovering plastic packaging, aluminum, steel and even paper from MRF residual streams delivered to a secondary MRF.

Goodman adds that when it comes to other types of plastic packaging, beyond PET and HDPE, applications and market demand for postconsumer plastics are lagging. To complete the value chain, much more will need to be done to create applications and market demand for other postconsumer plastics. As industry continues to shift packaging and products to plastics, applications and markets for postconsumer plastic packaging will develop, and that creates opportunities. The demand for recycled content, along with advances in such things as compounding chemistry, composites manufacturing and 3D printing technology will help drive new applications and markets for postconsumer plastics recycling.