

RECYCLING RIGHT SO WE CAN RECYCLE MORE

Dramatic shifts in waste composition have given rise to a plastics recycling stream that is remarkably complex and challenging to handle. Our author explains why smart planning and education is needed to protect MRFs and the larger recycling value chain.

BY ANNE JOHNSON



Interest in the concept of zero waste has been around for some time. However, the recent wave of corporate and municipal commitments to keep material from going to landfill, while well intentioned, has had perverse economic impacts on the recycling system that it seeks to support. Virtually all players in the plastics recycling chain – from materials recovery facilities (MRFs) to resin-consuming brand owners – have felt the effects.

While “recycling more” sounds like the right thing to do, those working in the trenches of materials recovery know recycling more of the right things is what is really needed if we want to maintain the economic viability of recycling programs. Recycling more of the right thing leads to quality recycled materials with a viable value proposition that supports the recovery chain and an overall lower environmental footprint.

What’s more, calling out the difference between recycling more and recycling right is now more important than ever as the value of recycling finds itself challenged by media dilettantes and recycling markets go through one of the worst economic stretches in the 40-year history of the industry.

Caught in contamination

So why all the pressure to recycle more and how does it relate to plastics recycling? One needs to understand the mix of materials

being collected for recycling today to understand both the pressure in the marketplace to recycle more and some of the economic irony that such action brings.

The “evolving ton” is the term being used to describe the shift in the overall composition of the municipal solid waste stream over the past 20 years. One of the trends responsible for this evolution has been the lightweighting of packaging, especially through the use of materials like plastics and aluminum that have displaced materials like glass and steel. More recently, even rigid plastic packaging formats have started to be displaced by rapidly growing formats in flexible packaging. But plastics are not alone in driving the waste shift: Electronic media have played a major role in changing the composition of our recycling stream by reducing the absolute volume of newspaper and office paper.

A recent presentation by Amity Lumper from Cascadia Consulting showed the results of residential curbside composition studies that tracked the recycling stream of several cities from 2000 to 2010. Cascadia’s research found an 8 percent increase in residential curbside collection of recyclables by weight but an 18 percent increase by volume, and researchers determined the volumetric changes were due almost exclusively to plastic. This is hardly surprising. Most municipalities in the last decade have made a switch to single-stream recycling, collecting all recyclables in one bin. The shift to single-stream collection allowed community programs to collect more, and that has been especially true in the

plastics realm. Recycling programs used to only collect PET bottles and HDPE jugs, but many programs have transitioned to include all Nos. 1-2 bottles and containers as well as Nos. 3-7 rigids, and some have as gone so far as all plastic containers. In New York City, for instance, residents are directed to throw all rigid plastics in the bin. “There is no more worrying about confusing numbers on the bottom of the container,” New York’s former mayor, Michael Bloomberg, said when the program was expanded in 2013.

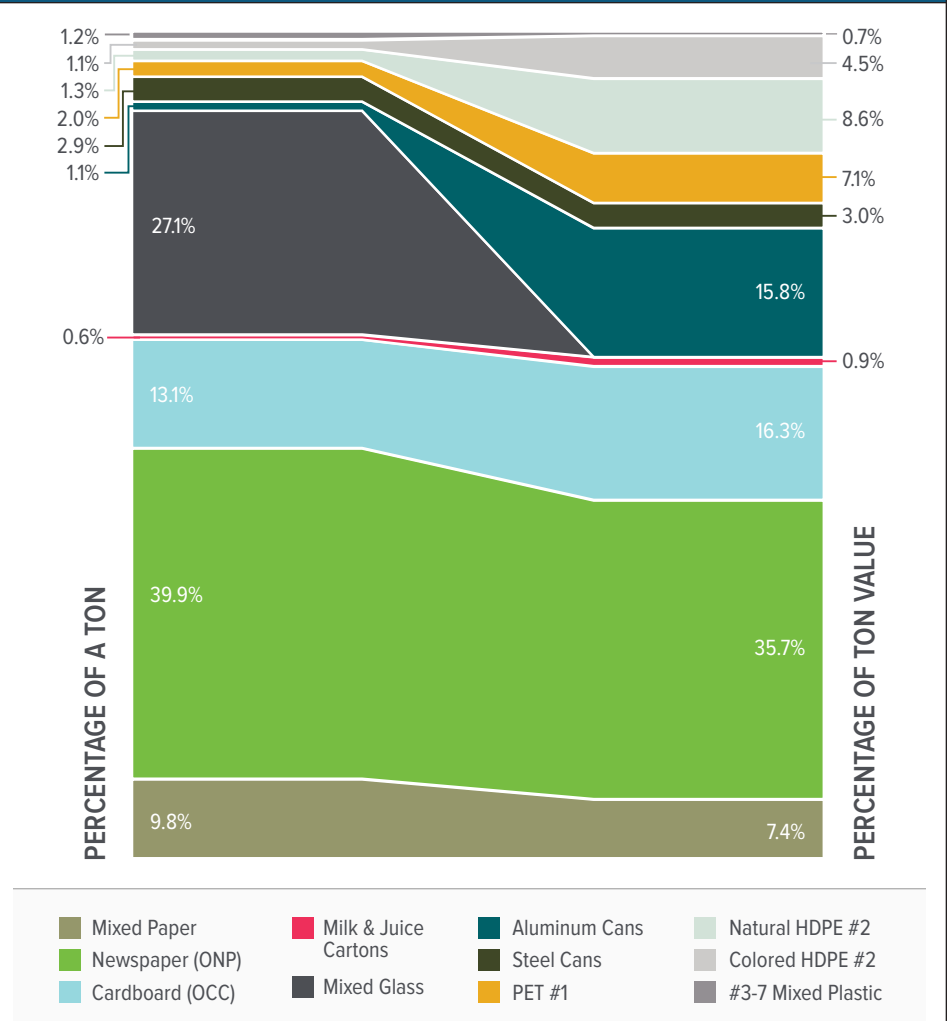
It’s also critical to understand that while more types of plastics are getting collected, complexity has increased even within the resin types the recycling system has traditionally handled. Growing pressure to recycle more has been applied by environmental groups, municipalities, consumers, retailers and consumer brands. In response, many companies are shifting to “recyclable” materials, often defining them as those accepted in community recycling programs. One of the best examples of this trend has been PET replacing PVC or PS thermoforms and heavier jar and container material like glass. The unforeseen consequence of this well-intentioned transition is the recent diversification of PET in the recycling stream, a phenomenon that has lowered the yield of usable materials (the PET used in clamshells, blisters and ketchup bottles is not the same as that used in a soda bottle).

What have such expanded plastics efforts done on the revenue front for recycling companies? According to analysis by RSS on the average commodity revenue per processed ton, the majority of recycling revenue in a MRF still comes from the denser suite of materials like fiber, which represents as much as 63 percent of the weight and about 60 percent of the value per processed ton generated at an average MRF (see chart on this page). Aluminum, which is about 1 percent of a process ton by weight, accounts for about 16 percent of the revenue. Plastics, mostly PET and HDPE, meanwhile, represent about 5.6 percent of the weight of a processed ton and about 21 percent of the revenue.

One major consequence has been greater inefficiency in sorting as measured by residue rates. Two recent surveys (from Moore Recycling Associates and GBB Consultants) documented increases in average residue rates at MRFs from 8 percent to 16 percent over the last eight years. The shifting stream also has

A MRF’s business proposition

The graph below was updated Sept. 1, 2015 and continually fluctuates with markets and recycling participation. Pulling from numerous recycling composition studies from across the U.S., RRS determined the average weight composition of incoming materials to MRFs, which is represented on the left side of this graph. The right side represents the average commodity revenue per ton of processed material and excludes residue. MRF operators adapt their operations to respond to these numbers or risk missing out on revenue, regardless of equipment, techniques or contamination levels.



Source: RRS, 2015

resulted in more contamination within the commodities produced by MRFs, lowering yields of desired material for all and increasing disposal costs. A recent MRF study conducted for the Carton Council, the American Chemistry Council, the National Association for PET Container Resources (NAPCOR), the Association of Plastic Recyclers (APR), and the Foodservice Packaging Institute documented an average loss rate of plastic bottles to the paper stream of 5 percent and showed clamshells having a loss rate of 29 percent.

Adapting to reality

Compared with materials like paper and steel, plastics is a relative newcomer to the recycling system, and the plastics recycling industry has shown it is quite capable in adapting to changes in its feedstocks. A case in point is the emergence of the Nos. 3-7 bale, which captures resins that do not have their own target bales, yet is creating an outlet for growing tonnages of valuable polypropylene. The construction of plastics recovery facilities and other developments show how markets are responding to process

these bales. Despite the industry's ability to adapt to a changing mix of feedstocks, according to the latest EPA data, the overall diversion of plastics from the municipal solid waste stream remains below 10 percent, indicating a lot of room to grow.

Paper mills, on the other hand, operate at such a large scale they cannot adapt as readily to changes in their recycled feedstocks. Paper is important to consider because it is a revenue anchor of MRFs, and at the end of the day, the MRF relies on efficient recovery of all commodities that come in its door. The MRF is caught between the growth and innovation of its inbound stream and the constraints of municipal contracts, operational costs, and the need to meet quality expectations from all commodity end markets on its outbound side. The MRF relies on the economic viability of all its materials streams, not just some. If the economics of recycling loses, plastic recycling loses, paper recycling loses, aluminum loses, steel and glass lose – and in the eyes of consumers, recycling loses.

This is the ultimate irony of recycling more without recycling right. Moving more and more materials into the system without a clear processing plan (or end markets) pushes costs into the system

and undermines the economic viability of the heart of the system – the MRF. If all materials that entered a MRF were the right ones and were sorted to the right bale, MRFs and end markets would be thrilled.

While plastics is one of the great success stories of the recycling industry, it is also a category of materials challenging to “recycle right” because from a consumer's point of view, the diversity of materials in the plastics space makes it difficult to know what to toss in carts and what to leave out. However, plastics are not alone. Complex packaging, coated fibers, the bowling balls, hoses, mini-blinds and various other system hindrances are entering the recycling stream in the name of zero waste.

Aligning around shared interest

Recycling more and recycling right must be aligned. This is what The Recycling Partnership, Keep America Beautiful and others seek to accomplish by improving consumer recycling education and behavior. Projects are underway to better understand how to add new materials to the system in a more systematic way. At the same time, the system of the future needs to be explored

to understand what technologies can be introduced to take complex materials and move them into markets in meaningful ways.

It is going to take a concerted effort from everyone involved in the value recovery chain to maintain the economic integrity of recycling and ensure it thrives with the evolving recycling stream. It's also up to the industry to reassert recycling's critical role in material manufacturing, job growth and environmental protection – clear benefits that often seem largely lost on recycling detractors. **PRU**

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