Fact Sheet
Northeast Committee on the Environment
Challenges Facing Municipal Solid Waste (MSW) Recycling in the Northeast

Prepared by the Northeast Waste Management Officials' Association (NEWMOA) and the Northeast Recycling Coalition (NERC)
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This fact sheet identifies some of the challenges facing MSW residential recycling programs in the northeast. It describes the overall economic benefits of recycling for the region and focuses on paper, glass, and plastic as key materials that are challenging for the materials recovery facilities (MRFs) to process economically. It focuses on paper, glass, and plastics because they present some of the most difficult challenges for today's MRFs.

Background

The overall U.S MSW recycling rate was approximately 34 percent for 2013, according to EPA.[1] In many locations, municipal recycling programs focus on paper, plastic, glass, and metal. There are significant differences in the materials collected in various locations.

States in the northeast use inconsistent approaches for estimating recycling, and many agency staff report low confidence in the available data. Solid waste program staff have reported greater confidence in the disposal data that they collect from permitted facilities. Because of data challenges, this fact sheet does not present or compare the states' recycling rates.

Economics of Recycling

Recycled materials are part of an international marketplace, and many factors impact them. Some of these contribute to market volatility, including the price of oil; the price of virgin resin; the value of the U.S. dollar; China's Green Fence; the economies of foreign markets; and communication among the U.S. MRFs, brokers, processors, and manufacturers about the industry's changing needs.

According to the Institute of Scrap Recycling Industries (ISRI), the total number of jobs created directly and indirectly (through suppliers and related jobs) through recycling of scrap metals, plastics, textiles, glass, and electronics in the seven states in CONEG is approximately 41,777. This translates to more than $9.5 billion in wages and taxes.[2]

Changing Materials in the Recycling Stream

The composition of MSW has been evolving in recent years with less newsprint, glass, aluminum, steel packaging, paper board, and paper packaging and more aluminum foil and closures, corrugated card, high-density polyethylene (HDPE) bottles and other containers, polyethylene terephthalate (PET) bottles and jars, and other plastic packaging.

Demand for paper has declined for the past decade. The most dramatic reduction has been in newspaper use. This is due to the increased use of electronic devices. North American newsprint

[1] http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures
[2] http://www.isri.org/docs/default-source/recycling-analysis-%28reports-studies%29/economic-impact-study-u-s-based-scrap-recycling-industry-2015.pdf?sfvrsn=10

shipments went from 12.7 million metric tons 2005 to 6.4 million metric tons in 2013.[3] Newspaper historically made up 60 percent of the recyclables collected, and all types of paper made up 80 percent of the material recycling facilities received. Today paper makes up just 45-60 percent of incoming material.[4]

Packaging is rapidly changing away from the use of glass and metal toward lighter materials, including multi-layer, multi-resin pouches, plastic packaging, and other types of containers that are either less recyclable or not recyclable. In addition, the plastic that is used for packaging has been light-weighted. For example, plastic makes up approximately 12.7 percent of the incoming recyclables by weight, but over 25 percent by volume. Processing costs are incurred by volume, but revenue is by weight. Therefore, recyclers need to process more material to generate a ton of recyclables.

The changing waste stream means MRFs need to process more volume, with less weight, increasing processing costs.[5] These shifts have been affecting the business models that have dictated the designs of the MRFs.

Trends in Municipal Collection for Recycling

Increasingly in the northeast and elsewhere in the U.S. recycling has transitioned from a dual stream to a single stream system. These programs collect all recyclables, including glass, paper, plastic, and metal in one container. Trash is collected separately. Single stream recycling (SSR) has grown rapidly in the region during the past five years. There were 81 communities in Massachusetts with SSR systems in 2011; by 2014 108 communities had transitioned. In New Hampshire, 38 facilities accepted SSR waste in 2011; by 2014 there were 53 facilities. In most single stream programs, the traditional 18 gallon recycling bin has been replaced by a 64 or 95 gallon cart. Single stream programs typically result in significantly more recyclables being collected due to the convenience for residents and the additional space for a bulky recycling stream. In Massachusetts, increases range from 10 percent to 60 percent (for Boston), depending on the baseline recycling rate in a given community.

With the growth of single stream collection and the use of large containers, is a rise in contamination of the materials. This contamination takes the form of film plastics, Styrofoam, non-recyclable plastic materials being put in the single stream bins; food waste and broken glass contaminating paper; liquids being absorbed into the paper; non-recyclable packaging, and a wide range of other non-recyclable materials. Contamination can drive up costs facing the municipalities and individual customers.

Paper

According to EPA's latest estimates, paper is approximately 27 percent of MSW.[6] Paper collection and recycling focuses in general on newsprint, office, magazines, cardboard, and boxboard. In the NECOE states, there are approximately 61 facilities that process and recycle one or more of these kinds of paper. A list of these facilities is available from the Northeast Recycling Council (NERC).

[3] April 27, 2015, Dylan de Thomas, Resource Recycling presentation to the Maine Resource Recovery Association
[4] Ibid.
[5] Susan Robinson, Waste Management, November 13, 2014 Presentation, EPA SMM Webinar Academy - http://www2.epa.gov/sites/production/files/2015-09/documents/changng_wste_stream.pdf.
[6] http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures

MRFs sort paper and send it directly to "end use" mills in the U.S. or abroad. Demand for cardboard has increased significantly since 1990 due to the increase in e-commerce shipments of products directly from manufacturers or wholesalers to consumers. Demand for other types of paper has been dropping, particularly newsprint (as noted above.). However, China continues buying U.S. paper. For a number of years, it has been the largest export material from the Port of Boston.

Single-stream recycling has resulted in an increase in "mixed paper" that is low value and often shipped to China. In addition, the liquids and glass present in SSR are absorbed by and stick to the paper, degrading its marketability.

Glass

According to EPA's latest estimates, glass is approximately five percent of MSW.[7] Glass collection and recycling at the curb focuses on mixed colored and clear glass. There is a demand for high-quality glass cullet.[8] In the NECOE states, there are several facilities that are processing and recycling one or more of these kinds of glass. A list of these facilities is available from the Glass Packaging Institute (GPI).

Of the NECOE states, five have bottle bill programs. Glass from these programs is generally clean and is shipped directly to the glass processors (not through MRFs) and then shipped to glass bottle manufacturers.

Some MRFs are no longer able to produce the quality of glass that manufacturers can use. Glass fines often end up mixed with the facility's residue that contains dirt and small-sized paper, plastic, and metal contamination. Due to the low quality product and the high cost of transportation, many MRFs face limited markets for their glass, and it ends up as processed glass aggregate and being used for alternative daily cover or shaping and grading materials. Some MRFs have recently started to employ more sophisticated sorting technology that improves the quality of recovered glass or conduct an additional processing step to recover a cleaner glass product from the residue. Encouraging other MRFs to make the similar investments could be an important aspect of addressing this challenge.

Some communities have begun to try to improve the quality of collected glass by adding drop-off locations. A few municipalities are piloting or considering trying this approach by carefully installing drop-offs that are conveniently accessible for residents.

Plastics

According to EPA's latest estimates, plastic is approximately 13 percent of MSW.[9] Collection of plastic for recycling focuses on number 1 polyethylene terephthalate (PET), (e.g. soda bottles, and milk jugs or number 2 high-density polyethylene (HDPE)) because they have the highest value. Many communities also collect numbers 3, 4, 6 and 7, however markets for some of these materials are less prevalent. The markets for number 5 plastic (polypropylene) are growing because of their use in containers, caps, and other packaging. In the NECOE states, there are approximately four facilities that are processing and recycling one or more of these plastics. A list of these facilities is available from the Northeast Recycling Council (NERC).

[7] http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures
[8] http://www.gpi.org/; Cullet.net: http://www.cullet.net/cgi-bin/mexview.cgi?wsc=01-0901
[9] http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures

The Association of Plastic Recyclers[10] is working with MRFs and processors, who convert plastic into useable materials (e.g., pellets) and sell it to end users, on some initiatives to help smooth out market fluctuations for recycled plastics. These include creating specifications for new types of materials to ensure that end users for those materials obtain what they can use.

Education & Outreach

SSR programs provide large bins to residents for collection of recyclables. This has greatly increased the amount of material that programs are collecting. However, the education of residents in the programs has not kept up.

In general, municipalities communicate with households about what is recyclable at the curb or transfer stations. People are often confused about what to put in their SSR bins. The changes in the waste streams described above have added to this confusion. Residents include materials that they "wish" were recyclable. In a recent MassDEP market research survey, 48 percent of respondents characterize themselves as "wishful recyclers", meaning they put items in the recycling bin that the MRF is not designed to sort and recover, such as plastic bags, Styrofoam, large metal objects, textiles and garden hoses.[11] The researchers concluded that while the public believes they are doing a good job recycling, it's easy, and they know the rules, in fact they are misinformed and do not know the rules. A lesson from this study is that state programs and municipalities need to do a better job recalibrating the public's understanding of what can and cannot be recycled in the bin, while being careful not to discourage people or make them feel that the programs are slapping their hands.

Depending on the location, neighboring cities and towns may have different wastes that they collect for recycling. Anecdotally, it appears as though the investment in recycling education programs has been in decline in many locations in the region, and creating cross-community education programs is challenging since the collection systems differ. Many recycling coordinators think that their programs have neglected education in recent years. Massachusetts DEP ended its recycling education grants for municipalities in 2007. Prior to that, the Agency spent about a half million dollars per year printing and mailing customized recycling flyers for about two million households. The SSR carts include a label on the top with pictures of what and what not to put in, which provides some guidance, but for many communities there is not much more outreach underway.

Some municipal recycling and state programs in the region have recently launched public education campaigns combined with greater enforcement, which could provide models for others. The Recycling Partnership (www.recyclingpartnership.org), Waste Management ("Recycle Often. Recycle Right" www.recycleoftenrecycleright.com), and Keep America Beautiful have also launched public education campaigns to address the challenges outlined above and others.

[10] http://www.plasticsrecycling.org/

[11] http://www.mass.gov/eea/docs/dep/public/committee-4/recpart15.pdf