

RETHINKING RECYCLING

Each success and failure reverberates throughout every sector of the recycling industry, but no changes affect the industry more so than the push toward single-stream recycling collection and processing.

by Susan Kinsella and Richard Gertman

The North American municipal recycling system is undergoing rapid fundamental changes without the benefits of coordination, a cohesive vision, or long-term planning. Rather, businesses and governments are making independent changes, including instituting single-stream collection programs with inadequate processing capabilities, without concern for the effects on other parts of the recycling system. Recycled product makers, in particular, are hard-hit by these changes.

Since recycling is an interdependent network, in which success or failure in one sector reverberates into all others, any change that creates problems in one sector becomes a problem for everyone else in the system – including those who may initially benefit from the change – until it is resolved. Current changes relate to adaptations to offshore demand for recyclable materials, strained municipal economies, the decline and outsourcing of many manufacturing industries, and a public disconnected from the impacts of their consumer desires.

Single-stream collection introduces a number of benefits, including increased efficiencies, reduced costs, wider participation and greater quantities of recovered materials. Processing facilities, however, have not yet perfected the intricacies of disassembling this mix of materials.

Death by 1,000 cuts

The problems evident in single-stream programs, however, are more the symptom than the cause – accelerating what already was a pronounced slide towards poorly sorted recovered materials, which results from many dual-stream programs as well. The result, though, is shocking quantities of glass, plastics and metals being delivered to paper mills in bales of fiber, the wrong types of fiber going to paper mills that can only use specific grades, increasing contamination of recyclables to all types of manufacturers, and too many recovered feedstocks lost to plastics, glass and aluminum manufacturers. In addition, many more materials are being down-cycled to low value uses. For example, the current sorting equipment allows some of the glass to be returned to container manufacturing, but most of the glass now ends up being used to replace aggregate.

Costs to recycled-product manufacturers have increased significantly for cleaning and screening poorly-processed materials, repairing damage to equipment, more frequently cleaning and replacing equipment, purchasing new raw materials to replace unusable

materials and landfilling recyclable materials that cannot be used. The problems created by poor quality feedstocks cascade throughout the mill and the whole production process. One paper mill engineer likened it to "death by 1,000 cuts."

Plastics manufacturers estimate that 39 million pounds of plastics were inadvertently sent to paper mills in one year alone because of poor sorting. For polyethylene terephthalate (PET) plastics in particular, solving these single-stream processing problems is economically compelling. While the value of one metric ton of newsprint may be \$125, the value of the same weight of PET is close to \$550. In California, where containers earn a redemption value, plus processing payments, that same metric ton can be worth more than \$2,000.

Even communities without single-stream programs are affected by the general quality decline in materials being shipped to market and the resulting impact on manufacturers' decisions to include recycled content. The challenge, then, is to extend innovations' benefits and efficiencies to the rest of the recycling system. To do so requires each recy-

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Best practices in single-stream recycling

The *Single Stream Recycling Best Practices Manual and Implementation Guide*, developed by Conservatree and Environmental Planning Consultants, can be downloaded at www.conservatree.org. The manual highlights many ways to rethink recycling operations, focus on more targeted goals and adapt innovations in ways that benefit the whole system, not just discrete parts of it.

To develop these recommendations, Conservatree and EPC interviewed, visited and received feedback from hundreds of North American participants in all sectors of the recycling system, from collection and processing to manufacturing and recycled product purchasing. The manual focuses on single-stream programs because that is where the greatest discrepancies currently appear. However, because single-stream programs are not suitable for every community, the recommendations also are intended to benefit the many other types of recycling programs that exist as well, including dual-stream and multi-stream programs.

cling enterprise to support the efficient functioning of every other part of the system.

Resolving the stresses in the current system requires rethinking some conceptual foundations.

Manage resources, not waste

The current configuration for municipal recycling programs is upside down; recyclables are resources, replacing the need to mine, cut and drill for raw resources. Plus, using recyclables to make new products reduces energy and water use, pollution and solid waste. Recyclables also make up over half the discards from residential and commercial sources.

Therefore, rather than integrated waste management programs that include some recycling on the side, the centerpiece of community collection programs should be materials recovery. Garbage should be secondary and only constitute what has not been recycled. Focusing on developing resource management systems will maximize recycling's many environmental, economic and development benefits, while citizens' discards will still all be collected and public health preserved.

Too often, recycling has been considered an add-on to long-standing garbage collection programs, and has been expected to pay its own way. Garbage collection, however, is not held to the same financial requirements, since it is supported by user fees or local taxes. Commonly, this situation has

led to new program and equipment costs being assigned to the recycling program, but all the savings accrue to the garbage collection system, even when many of those savings were produced by the increased recycling. Instead, the cost of recyclables collection should become part of the total system costs paid by the ratepayers or taxpayers, not a stand-alone cost center.

Provide feedstocks for manufacturing systems

Recycling must effectively support manufacturers' need to meet demanding production specifications. Recycled-product manufacturers are critical to the ongoing success of local communities' recycling programs. If the quality of the recovered materials is not high enough, manufacturers are not able to make new products from them, thus the market for recyclables collected by communities is undermined.

There are few quality requirements for garbage that is landfilled. Very few municipal recycling programs seem to have been designed with manufacturing in mind. Rather, they focus on collection and sometimes processing because these are the most visible and immediate aspects of the local recycling system. Instead, collection focus must shift to material quality requirements that support recycled-product manufacturing.

Collection and diversion are not recycling

Most of the public, and even many community recycling managers, consider materials to be recycled once they are collected. This reflects the close relationship recycling program managers have with the collection system. In reality, materials are not actually recycled until they are made into new products. Local recycling programs should be designed to maximize their materials' use in manufacturing, with both collection and processing, to ensure high quality production feedstocks.

Diversion from landfills has become a major driver for many recycling programs, with some states and municipalities operating under legislative requirements for achieving specific diversion goals. However, too many poorly sorted materials, counted as diverted from local landfills, are ending up landfilled by manufacturers because they are unusable. This is not a responsible outcome for diversion. These materials simply made a longer trip to the landfill and are not really diverted. In other words, poor processing trashes recyclables.

Since communities do not track materials through the whole system, they may not even realize when the result is incomplete or improper processing and marketing. Recyclables change ownership many times as they travel from collector to processor to manu-

facturer, and communities have not established contractual requirements to follow the materials.

Community recycling programs should incorporate manufacturers' millage loss data about the fate of materials into calculating a more accurate diversion rate. They should know how much of their materials were actually usable, and also how much of the use resulted in continuously recyclable products.

Focus on recovering useful resources, not simply markets

Recycling is not simply about buying and selling materials. Those are the means for keeping the system functioning, not its goals. Recycling, instead, is focused on environmental goals for conserving natural resources, water and energy – values the marketplace does not adequately take into account.

If recycling markets are based only on economic goals, the system will be shaped by short-term interests with little regard to the long-term impacts of those decisions. In turn, what happens to the recovered resources becomes less important than just moving the materials to market.

In fact, many of the costs of a poorly run recycling system do not fall on those buying and selling. A processor is not concerned with whether domestic recycled product manufacturers stay in business, but communities and governments pay a high price – including monetary, non-monetary and environmental – when a manufacturer closes its facility or abandons recycled-content product making. Governments must represent these public interests because sheer economic forces are not comprehensive enough to do so.

Exported recyclables re-shape the recycling system

North American recovered materials have long had strong export markets. What is new is the huge and rapid increase in export demand. Some think that shipping North American recovered materials off to China or other countries is simply expanding the size of the recycling system but not fundamentally changing it; the reality is more complex.

When the North American recycling system was predominantly confined to this continent, the materials could be expected to continually circulate, repeatedly being used to make new products. The reality changed when the system significantly expanded outside the continent. Many of the exported recovered materials, such as newspapers and some plastics, do not re-enter North American markets in large quantities, which changes the ability of some domestic recycled-product manufacturers to continue using those grades of materials. Others, such as some corrugated boxes, return as new boxes with

different and reduced quality contents that can discourage domestic corrugated recycling.

Many trading partners accept commingled materials appropriate for some products, such as mixed papers used to make paper-board packaging. However, if collected newsprint and office papers go directly into a product that uses mixed paper without having first been recycled as sorted grades, then they are lost to the newsprint, tissue, and printing and writing mills that also need recovered papers.

Many of the overseas manufacturers that accept commingled materials can do so only because they can afford to reprocess them before use – a clear indicator that our processing facilities are inadequate. Many North American manufacturers also have built some reprocessing into their systems, but extensive resorting prices them out of competition. Ignoring these requirements is short-sighted and counterproductive.

When domestic recycled-content manufacturers can no longer get the quantity and quality of recovered materials they need, they are likely to either close – resulting in more job and revenue losses – or convert to using virgin resource materials, resulting in the use of more extraction technologies. Instead, processing must be upgraded to produce high enough quality recovered materials to be used by either North American or overseas manufacturers.

Making choices for the whole system, not just one sector

Some recycling programs' changes over the past two decades have been efforts to institutionalize the programs, while some have been intended to compel continually higher recycling rates. Along the way, as improvements have been made to one part of the system or another without regard to their subsequent effects, the overall understanding of recycling as a whole system has been lost as an evaluation guide.

When recycling is viewed as a whole system, it is obvious that the quality of the materials shipped to manufacturers is every bit as important as picking up the materials at the curb. Communities must contract for services that include all the elements of the recycling loop. Only when collectors and municipal programs ensure the optimal functioning of the other sectors can the potential of increased volume make the added costs throughout the system worthwhile.

Setting standards for a sustainable, healthy recycling system

An economically successful recycling business ensures the recycling system's health and longevity. But that, in itself, is only the means, not the goal, of recycling. There must be a driver that coordinates all the competing interests.

Community recycling programs were developed to enhance public interest goals for conserving natural resources, water and energy, strengthening environmental quality and reducing climate change – values that sheer economic forces are not comprehensive enough to take into account. They also employ or hire the collectors, direct the processors and assist the manufacturers in obtaining high quality feedstock materials as inputs for their new products. Additionally, local governments decide what materials their residents can set out for collection.

Municipal governments hold the broadest expanse of both the public's and recycling's universal interests, which is why they must be the ones to drive the system to its highest potential. They both have the responsibility and the authority to set the terms for how the system will function, and can do so by providing or contracting for recycling services that sustain all parts of the cycle, not just collection.

Communities' contracts with processors rarely include specifications for meeting man-

ufacturers' requirements, yet the contamination issues mills face are most often the result of processing for throughput, not for quality of feedstock, or because upgrades in processing capabilities have not matched the collection changes. Communities that accept processing that produces poorly sorted materials, even if markets exist for them, undermine the health of the recycling system as a whole.

Instead, in the same way that local governments specify collection service requirements, they also should specify processing and marketing requirements, with input and feedback from the industries that will use the recovered resources in the manufacture of new products.

A vibrant recycling system is essential

Demand for consumer products is rapidly growing throughout the world, and developing countries are building manufacturing plants at rates that are outstripping the sustainable use of raw materials. Recycling is critical as the foundation for sustainable production. Single-stream and other collection programs promise to provide the quantities of recovered materials needed for this increased production, but the larger volumes only make sense if the materials are usable by the production industries.

The recycling industry has to play a leading role in creating more environmentally sustainable manufacturing methods, but it can only do that if program managers step back, look at how best to encourage a vibrant, complete recycling system in a changing world, and make sure that the changes made will serve the dynamic promise of recycling both now and also in the future. **RR**

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