The collection of commercial film for recycling can be a growth area for paper recyclers handling OCC.

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According to the “2012 National Postconsumer Plastic Bag & Film Recycling Report,” more than 1 billion pounds of valuable postconsumer plastic film were recycled in 2012 in the United States, but billions more never made it into the recycling loop in light of the lack of efficient collection methods.

Given that commercial film is almost always found in proximity to old corrugated containers (OCC), paper recyclers are uniquely positioned to collect it. Its scrap value is often three times that of OCC, so programs that maximize the benefits of co-collection are likely to increase in number. The key to the long-term viability of co-collection is increased focus on keeping the film stream clean and dry.

Plastic film is a broad category of flexible plastic that includes products such as bags, wraps and pouches. Most of it is polyethylene (mostly linear low-density polyethylene, LLDPE) manufactured for the packaging market.

WHY NOT PAPER AND PLASTIC?
Without any special effort from industry
or government groups, the recycling of plastic film by the paper recycling sector is growing. The primary drivers of that growth are:

- Plastic film for recycling has many sources in common with paper for recycling, and the recycling processes are similar in many ways. Where recyclers are recovering OCC, film scrap likely also is available.
- Paper recyclers frequently find film more profitable than their traditional materials.
- Paper use is declining and recovery rates are already high, so paper recyclers are looking to other materials for business growth opportunities.
- Whether it’s to meet their green goals or to comply with local mandates, generators are seeking to recycle more materials. Film represents a great opportunity to improve materials recovery, reduce disposal costs and even generate revenue.

Recovered paper volumes in the U.S. grew steadily for 40 years and peaked at the end of the last decade. This is because of the significant decline in the use of printing and writing papers (including office papers) and newsprint. While recovery of paperboard packaging grades (boxes) is stable to increasing, its growth is roughly that of population growth. Supplies of potential new materials, such as polycoated food boards, are not sufficient to offset the overall decline in paper use.

With their primary business declining in many cases, paper recyclers need new opportunities. The business expertise, approaches and much of the equipment needed for plastic film recovery are very similar to those used in paper recycling, making film recovery a natural extension for paper recyclers.

Paper recyclers commonly perceive that plastic film is a bonus during the collection of OCC. When these businesses go after OCC, they essentially see plastic film as a revenue source with minimal increased collection costs. Many of the processors interviewed for this article say that 10 years ago, they did not have management personnel focused on plastic film recovery and sales; now, most of them do.

**FILM IN THE SCRAP LANDSCAPE**

Comparing OCC recovery to plastic film recovery is a good metric for examining the growth potential in film recovery. As background to this article, a series of traditional commercial multimaterial and recovered paper processing and collection companies were examined with regard to plastic film recovery. Together, the 22 companies handle about 7.7 million tons of OCC and about 217,000 tons of film annually. That’s an average ratio of 35-to-1, but interest in plastic film recovery varies widely among the processors. The OCC-to-film ratio for the top five firms is about 24-to-1; for the bottom five, it’s 357-to-1. (These “range” ratios were simple numerical averages of the top and bottom five companies and were not weight adjusted. Processors are usually brokers of film to varying degrees. Some of the plastic film they handle is baled by generators and just sold by the processors in brokerage-like transactions.)

While paper use is declining, film use is on the rise, with a projected annual growth rate of nearly 4 percent, according to the article “Global demand for plastic film to hit 71 million metric tons,” in **European Plastic News,** Aug. 7, 2013. Film is found in quantity in nearly every distribution warehouse and retail business. With increased focus on fuel efficiency and lightweighting, film compares favorably with more traditional packaging materials that are almost always heavier. Approximately 32,000 ocean shipping containers enter U.S. ports daily; many of the products they contain are individually wrapped in plastic film and stacked on pallets that are also film-wrapped. Add this imported material to domestic virgin production of film for wrap and bags, and the result is billions of pounds of scrap film that could be recovered each year. The film stream is growing in complexity, especially in the packaging realm, with multilayered, degradable and impure polyethylene (PE) films, but the majority is PE and highly recyclable.

Consider a shopping mall. Each of its retail tenants typically receives weekly shipments. Nearly every garment arrives individ-

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**TUNE IN**

The Association of Postconsumer Plastic Recyclers and the Flexible Film Recycling Group will host a webinar Aug. 19, 2014, at 1 p.m. EST titled “Expanding Opportunities in Film Collection.” Attendees can learn about demand for plastic film scrap and the tools available online at www.plasticfilmrecycling.org to support the collection of high-quality material. Speakers include Nina Bellucci Butler of Moore Recycling Associates, Dave Heglas of Trex and Jim Feeney of Wisconsin Film & Bag. More information is available at www.plasticsrecycling.org/market-development/web-seminars.
ually wrapped in a clean, clear PE sack. After unpacking a shipment, most of the merchants recycle the OCC and discard the film. They do this despite the fact that plastic film, if kept clean, dry and contaminant-free, has the higher scrap value on a weight basis. And film is potentially the second largest recycling stream after OCC; one mall manager says plastic film makes up about 50 percent of the mall’s waste stream by volume after OCC is removed. Some malls, with the support of recycling groups such as the Flexible Film Recycling Group (FFRG), are exploring opportunities to reduce disposal and demonstrate potential revenue generation for large retailers and property managers.

**MARKET DEMAND FOR SCRAP FILM**

For many years those involved with plastic film recovery had little difficulty selling the material, with a ready export market purchasing roughly half of what they collected. But Operation Green Fence—China’s crackdown on the import of unprocessed scrap plastic—has curbed demand from the biggest customer, especially for the lower grades of film, such as residential curbside collected bags and wraps and material that has gathered residue during processing. As with most recycled commodities, lower-quality films are more difficult to sell, and movement of these materials can become problematic in soft markets. However, if the material is clean, dry and only polyethylene, U.S. markets are strong and there is demand from export markets beyond China.

Scrap film quality has historically been highly variable. The result in the reclamation end of the business is a trend toward vertically integrated companies that process bales into an end product. Integration enables companies to manage variations in quality on a batch-by-batch basis. Margins are always tight, so processing capabilities are usually limited to washing a known type of plastic or sourcing very clean material that can bypass the wash phase.

The composite decking industry continues to be the leading market for scrap film, but other end users, such as bag and sheet manufacturers, are seeking higher grades of film scrap. Real growth in the use of postconsumer resin in new products is hindered primarily by lack of supply of consistent quality material.

“From our perspective, the market for quality bales of film scrap is strong. The key for ongoing demand is related to the recyclers’ commitment to bale quality. Those organizations who choose to avoid the steps to ensure quality will struggle to take advantage of this demand,” says Jim Feeney, president and CEO of Wisconsin
Film & Bag, Shawano, Wisconsin. With more restrictive specifications, best practices, signage and design guidelines are needed to ensure a steady supply of high-quality scrap film. One of the best ways to stimulate market development is to ensure a growing supply of quality material. Fortunately, organizations such as the FFRG, the Sustainable Packaging Coalition and the Association of Postconsumer Plastic Recyclers are working in concert to provide critical guidance to support the growth of a high-quality stream of recyclable plastic film scrap.

BARRIERS TO PLASTIC FILM RECYCLING

The biggest issues with film recycling are the volume-to-weight ratio and the other handling challenges. Intermediate storage before baling is a critical aspect of processors’ ability to handle film cost effectively. Because film acts like a magnet, carrying along anything it touches, collection of clean material can be challenging.

Unfortunately, domestic reclaimers have little to no demand for film that travels through the traditional material recovery facility (MRF) environment and is exposed to moisture, dirt and other contaminants. Unlike OCC, film must remain dry if it is to retain scrap value. Bypassing the MRF also avoids operational challenges, such as film wrapping around MRF equipment, which leads to reduced running time and less effective sorting. Film collected outside of the MRF environment has a better chance of remaining clean and marketable, unless a MRF has dedicated space for clean, dry materials.

Plastic film wrapping around moving parts of processing equipment and conveyors is a common problem. To avoid downstream handling issues, most of the processors we spoke with manually remove film as a first step in any sorting process. While many operators use conventional paper recycling equipment to recover film, some new or alternative equipment options have emerged. For example, some processors have installed film vacuum systems and auger-densifying systems that address the need to reduce storage space for film prior to baling.

Generators of large volumes of plastic
films often bale their own material at the source, just as they do for OCC. In addition to more on-site baling, including minibales, found in a growing number of shopping centers, more dedicated processing space for OCC and film are needed. Film that is compacted with other recyclables beyond OCC, such as bottles and containers, becomes very dirty and is typically more difficult to market. Many material generators recycle only if it’s less expensive than disposal (or, as is very rarely the case, if regulations require it). Because plastic film is light in weight for its volume, the potential savings on disposal costs are not sufficient to motivate businesses to recycle.

The real benefit of plastic film recycling will be more evident as we see greater emphasis on quality and, therefore, higher scrap values, so that the material generates increased revenue while enabling companies to meet their waste diversion goals. Collection strategies such as sandwiching film and OCC have worked in some situations where volumes are high and quality is maintained. Recyclers generally try to avoid the added costs in rebaling film and OCC, however.

Collectors who receive film from groceries/food establishments have concerns about food contamination. Based on an ongoing bale audit study of postconsumer bags and wrap collected from a major grocery store chain, film bales contain:

- bags (retail and grocery), 10 percent;
- wraps, film and other bags, 12 percent;
- stretch film, 70 percent;
- nonpolyethylene film, 3 percent;
- nonflext PE, 3 percent; and
- nonpolyethylene, 2 percent.

Contamination from food is not a significant issue, provided the program is designed with employee training and quality controls, according to reclaimers of film and bags collected through retail programs.

**ONGOING EFFORTS**

While the paper recycling sector is aware of the potential for plastic film recovery, further promotion to this sector is still warranted and needed. We look forward to a growing set of tools, model programs and policies that encourage businesses to capture more film from their waste streams. Organizations such as the Flexible Film Recycling Group are leading the effort to increase plastic film recovery.

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