



# MATERIALS RECOVERY FACILITY STUDY

Chippewa County

September 14, 2012

Recyclable Materials Markets Report

# Report



**Resource Recycling Systems**  
*Sustainable Systems for a Waste-Free Future*

# Table of Contents

<b>Introduction .....</b>	<b>1</b>
<b>Historical Price Assessment .....</b>	<b>1</b>
<b>Recycling Markets Trends .....</b>	<b>1</b>
<b>Commodities from Containers .....</b>	<b>5</b>
<b>Downward Demand Curve - Ferrous.....</b>	<b>7</b>
<b>The Economics of Recycling.....</b>	<b>9</b>
<b>Sliding Rates.....</b>	<b>10</b>
<b>Adjusted Sliding Rates.....</b>	<b>10</b>
<b>Globalization of Recycled Commodities .....</b>	<b>11</b>
<b>LIST OF ACRONYMS.....</b>	<b>12</b>
 <b>List of Tables and Figures</b>	
Table 1: End Market Commodity Types and Market Indicator .....	3
Table 2: July 2012 Spot Market Pricing.....	9
Table 3: Average Commodity Revenue (ACR) Analysis .....	11
Figure I: Market Historical Data – Fiber (\$ per Ton) .....	3
Figure II: Market Historical Data – Containers (\$ per Ton) .....	5
Figure III: Producer Price Index: Plastics .....	6
Figure IV: Ferrous Scrap Pricing .....	8

## INTRODUCTION

The Chippewa County Land Conservation and Forest Management (LCFM) Materials Recovery Facility (MRF) Study represents multiple communities in Chippewa County – each with its own characteristics and goals – yet bound by common duties to maintain a cost-effective recycling collection system. Chippewa County and the municipalities in the County also need to comply with state recycling laws and satisfies effective recycling criteria. Many cities and solid waste districts throughout the nation are setting new, ambitious goals for higher recycling, waste recovery rates and even targeting zero waste as an attainable goal.

State cuts have reduced recycling grants to counties and municipalities. Tax levy caps have removed the capacity of local municipalities to raise revenue through increases in property taxes. Recycling costs to municipalities and landowners are expected to continue to rise. In response to these circumstances, the Recycling Division conducted this study to assess where changes could be made to gain efficiencies in municipal programs. Recognizing the roles and responsibilities as currently delegated to the County and to the municipalities under the Chippewa County Responsible Unit (RU) Intergovernmental Agreement, the scope of the study comprised three primary deliverables including: 1) a Market Analysis Report, 2) a Recyclable Materials Market Analysis, and 3) a MRF Options Analysis Report.

The Recyclable Materials Market Analysis included an evaluation of the current recyclable current market value of materials, market trends, and a discussion of the recycled commodity market drivers.

## HISTORICAL PRICE ASSESSMENT: MARKETS FOR MATERIALS

All materials collected and ultimately processed in a recycling program are considered commodities. This means that in spite of market demand fluctuations and associated price increases or decreases, the total collected tonnages must yield a profit to maintain a healthy, stable recycling program. In reviewing the Market Trends Data, the market demand and commodity prices for fiber, plastics, aluminum and steel have remained strong to stable. Two brief periods in the early 1990's and mid 2000's have seen brief price tumbles. But recycled commodity price rebounds have been quick and over time have shown an almost universal strengthening. The commodity revenues associated with these materials have over time provided the financial foundation for most recycling programs, whether publicly or privately sponsored.

## RECYCLING MARKETS TRENDS

Manufacturing techniques using post-consumer materials also have kept pace with technology and knowledge of the materials sorts. Mills have improved their equipment and systems to predict and adapt to a degree of contamination and to capture contaminants to minimize damage to equipment and maintain quality product standards.

End markets for even more materials, especially the #3-#7 plastics, has provided opportunities for Material Recovery Facilities (MRF's) to increase their list of accepted materials and collected volumes. In fact, the capabilities of both dual and single sort collection programs to easily add materials types to their collection programs has led to the expansion of recycling programs nationwide. Without these inherent flexibilities, the successful recycling of cartons, juice boxes, textiles, boxboard, and exotic plastics (#3 - #7) would not have grown as quickly over the last five to ten years.

Environmental concerns, higher commodity prices and increased regulation are making recycling increasingly attractive and viable. While the recession reduced consumer demand for products in general, demand for products manufactured with recycled goods has risen over the past five years. As a result, the Recycling Facilities industry has experienced sustained growth. Further, in the next five years, demand will continue rising, as new regulations, such as Extended Producer Responsibility, and the product stewardship requirements of the major retailer in the world, Walmart, require manufacturers to use more recycled content as inputs.

The forecast increases in government regulation will also benefit the industry by providing recycling mandates, essentially providing more revenue opportunities for industry operators as recycled commodity prices rise. General consumer sentiment has also shifted toward green products and, subsequently, increased demand for products packaged in or produced with recycled goods...

The recycling industry is a mature industry, understands and controls its cost structure and has well-established relationships with end markets. The industry's financial return is expected to grow at an annualized rate of 1.8% over the 5 years to 2017, while US GDP is expected to grow at a similar pace of 1.9% per year. New players are expected to enter the industry as profit levels rise due to projected stable growth in recycled commodity demand and increased prices over the next five years.

The Recycling industry, which sells recycled commodities and finished goods to customers, has expanded at an average annual rate of 4.4% over the past five years. Although the recession reduced consumer demand for products in general, demand for products manufactured with recycled goods has risen overall during the past five years due to shifts in consumer preference toward products that are perceived as environmentally friendly. Manufacturers of products made with recycled materials demanded more recycled commodities from wholesalers, in turn aiding industry demand.

Despite revenue gains during the past five years there was considerable volatility in recycled commodity prices, which dropped during the recession in response to slumping consumption. During 2009, recycled commodity prices were particularly low, resulting in lower revenues for the industry. Revenue volatility became a concern for industry players, and many sought to consolidate operations to become more stable and achieve greater economies of scale. Ultimately, though, increased consolidation has not reduced the number of players; more firms entered the industry after the recession amid growing recycled commodity prices and favorable government regulation. Even so, the two largest players in the industry, Waste Management Inc. and Republic Services Inc., account for a significant portion of the industry's total revenue.

It is difficult to project future prices for recycled commodity as the value is closely linked to global economic growth and is especially sensitive to growth of industrialization of emerging markets such as China and India. Higher levels of government regulation and voluntary manufacturing and product requirements for recycled content will benefit the industry by pushing potential downstream customers to use recycled goods in manufacturing processes. This trend is expected to boost the overall market for recycled goods and help stabilize revenue volatility. Consolidation of the recycling industry will likely continue in the next five years as integrated waste companies seek to add recycling to their portfolios.

Discussion with broker and commodity dealers in the central Wisconsin region indicate that basic market prices in the region are consistent with the prices quoted by the Official Board Market (OBM) Yellow sheets for Chicago and plastic prices are based on the Waste News 1st Issue of Month - Chicago region. Aluminum is based on the trade publication Aluminum Metal Market Low price – 1<sup>st</sup> issue of the month. Glass is based on the Anchor Glass Container Corporation Rate for glass at the Shakopee, MN facility.

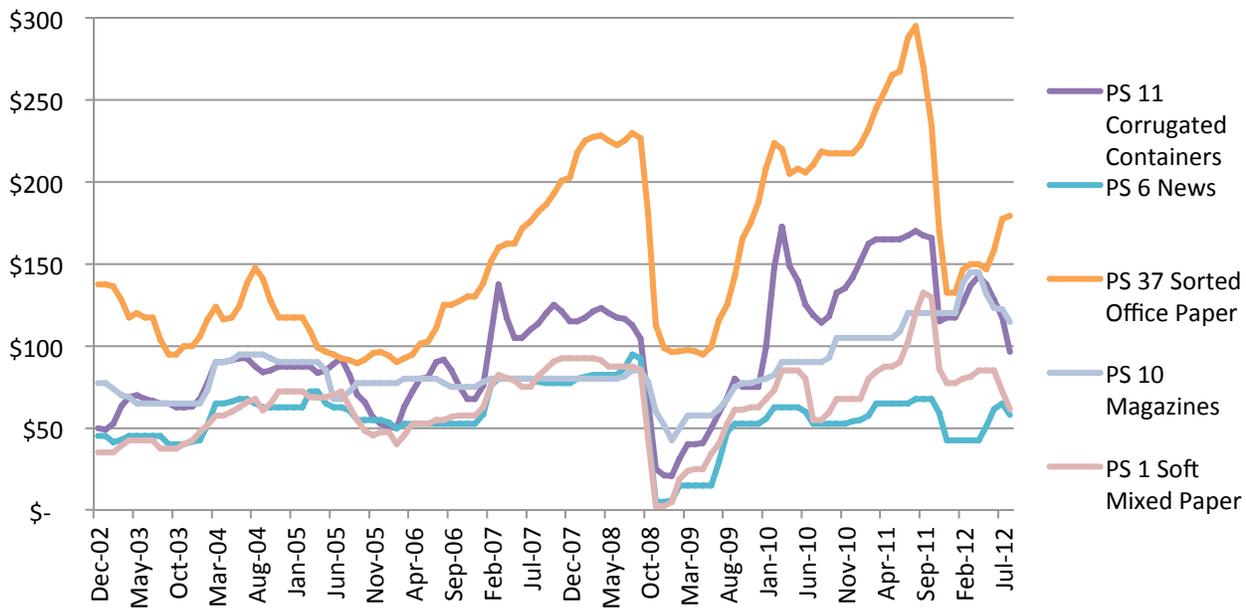
**Table 1: End Market Commodity Types and Market Indicator**

Acronym	Material	MARKET INDICATOR
ONP	Old Newspaper	OBM #8 CHICAGO HIGHSIDE
OMG	Old Magazines	OBM #8 CHICAGO HIGHSIDE
OCC	Old Corrugated Cardboard	OBM #11 CHICAGO HIGHSIDE
RMP	Residential Mixed Paper	OBM #1 CHICAGO HIGHSIDE
OTD		OBM #1 CHICAGO HIGHSIDE
PLASTIC HDPE NATURAL	High Density Polyethylene	Waste New 1st Issue of Month - Chicago Region
PLASTIC - HDPE PIG	High Density Polyethylene Pigmented	Waste New 1st Issue of Month - Chicago Region
PLASTIC - PET	Polyethylene terephthalate	Waste New 1st Issue of Month - Chicago Region
GLASS-CL	Clear	ANCHOR RATE
GLASS-BR	Brown	ANCHOR RATE
GLASS-GR	Green	ANCHOR RATE
ALUM	ALUMINUM	ALUMINUM METAL MARKET LOW - 1ST ISSUE OF MONTH
STEEL	Ferrous Steel and Iron	Average Monthly Sales

### FIBER MARKETS STEADY OVERALL

Fiber materials experienced a drop due in prices due to the recession in 2008/2009, however, the dramatic drop experienced in fiber markets (September 2009 – April 2010) was not simultaneous with that experienced in containers (November 2008 – September 2009). News and Magazines tend to have a more stable price over time than other corrugated containers, office paper, and mixed paper, which show more dramatic drops and rises. This suggests a larger variety of cleaner, sorted product can insulate the basket price from intermittent price swings and even dampen larger economic busts.

**Figure 1: Market Historical Data – Fiber (\$ per Ton)**



Bill Moore with RISI, Atlanta—which provides analysis on pricing, markets, and trends in paper recycling—reports that newsprint volumes have declined significantly due to major decreases in worldwide demand, although the market for recycled fiber remains strong overall. The market for old newsprint (ONP) peaked in the late 1990s and has declined by more than half since in the United States, while Europe and Asia have also seen significant declines. Fifteen to 20 years ago, ONP was 60% of the material that a MRF processed—now it's down to an average of 25%.

A second grade that has seen continued strong foreign demand is packaging fiber, which consists mainly of recycled paper and old corrugated container (OCC) paper. The box business in the United States has been flat to declining, especially recycled paper board, which is primarily boxes—cereal boxes, shoe boxes, pizza boxes. China has become a major manufacturer to the world, so box production has really skyrocketed in China while falling in the US in the past 10 years, however the boxes still wind up here. The amount of OCC and, to a lesser degree, old boxboard has been increasing. In the residential waste stream, twenty years ago, of the amount of paper in the residential stream, OCC was a couple of percent—now that amount is as much as 15% to 20%.

Another grade for which demand is growing is the “away-from-home-tissue” business, which consists of napkins, paper towels, and tissue other than high-end facial tissue for businesses such as institutional, restaurants, and airlines. China's government incorrectly perceives hygienic issues with using recycled paper for tissue and uses virgin pulp in this market. However, because tissue does not ship well overseas, China does not ship tissue to the United States, which sees widespread use of recycled paper in tissue. The feedstock is office papers, a subset of what we call printing and writing papers, which, just like newsprint, are declining in the US. Over the last five years, because of electronic documents, there is less printing and writing paper in the recycle stream, and that's keeping prices high because of the supply shortage. There's also less export of it.

The fourth major grade in recycled fiber is “printing and writing paper.” The least economical recycling is converting printing and writing papers to printing and writing papers, primarily because of the yield loss, and it requires fairly labor- and capital operating cost-intensive operations to get it up to the quality for reuse. A little is used in the US and Western Europe. India, a distant second to China in importing recycled paper, is an anomaly and uses a lot of recycled printing and writing paper.

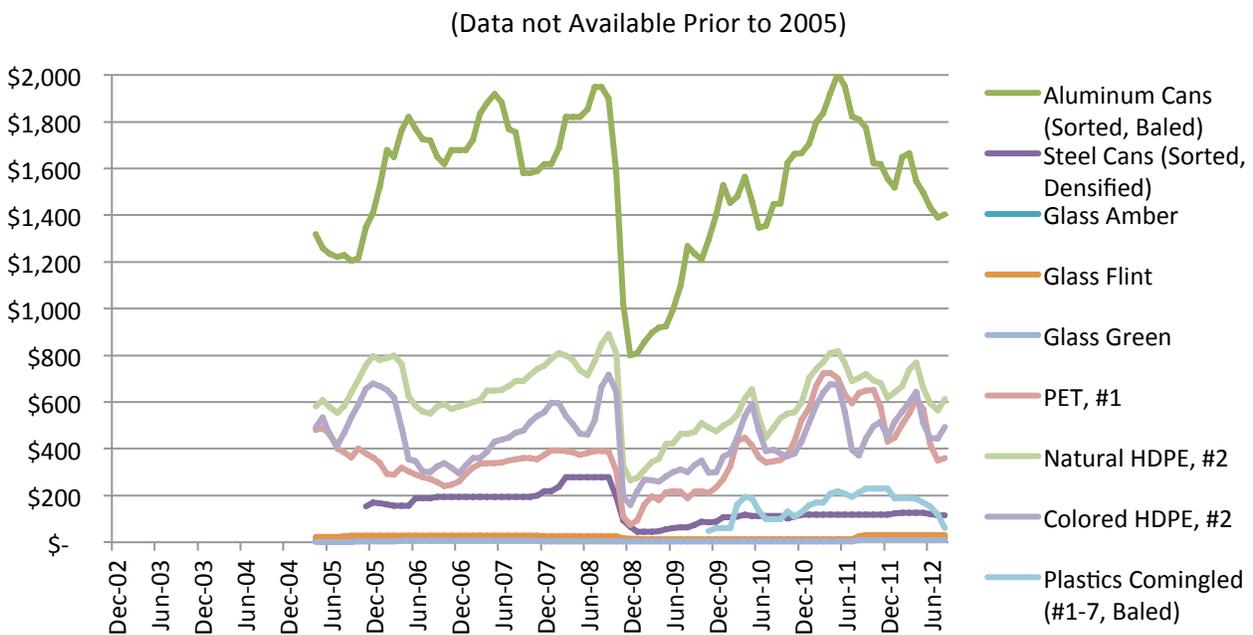
Communities within the Midwest five-state region, which comprises Illinois, Indiana, Michigan, Ohio, and Wisconsin, market large volumes of paper to mills in Michigan, Wisconsin, and Indiana. Markets for fiber have not changed much for these regions since the economic slowdown made its presence felt in 2008. The mixed paper grades and some of the ONP grades go overseas and have more demand than domestically, whereas OCC and cardboard still tend to stay domestic. In this region, it appears that it's not that economically viable to ship to the ports on the coasts and still get the value that you could get by keeping it local. Even though the export markets seem to be paying more, there are freight issues that tend to increase shipping costs. Finally, there is still a lot of demand within the five-state region for OCC.

Overall, recycled fiber represents a steady market for communities in the Midwest region. The challenge with ONP is volume. Newspapers are thinner, fewer people are buying them, and they've even gone as far as taking a couple of inches off of the sides of them. In turn, consumers are not putting as much paper in their recycling bins. OCC is the one fiber grade that appears to be in demand-supply balance.

## COMMODITIES FROM CONTAINERS

Only within the past year have containers returned to the same range of prices they achieved before the recession hit in late 2008 as seen in the following chart. Several trends can be seen in the graph above, especially in terms of rank in per ton prices for materials. Aluminum tends to sit much higher in price while experiencing slightly less of the volatility found in #1 and #2 plastics. PET and Colored HDPE have switched rank several times since 2008. In fact, all plastics have experienced peaks and valleys at different points over time. There is less volatility in commingled plastics #1-7, likely due to the broader range of materials although the unit price is lower due to the mixed bales. Finally, both steel and glass dropped in value due to the recession; however they remain extremely stable compared to other materials.

**Figure II: Market HISTORICAL Data – Containers (\$ per Ton)**



### PET, HDPE STILL LEAD PLASTICS RECOVERY

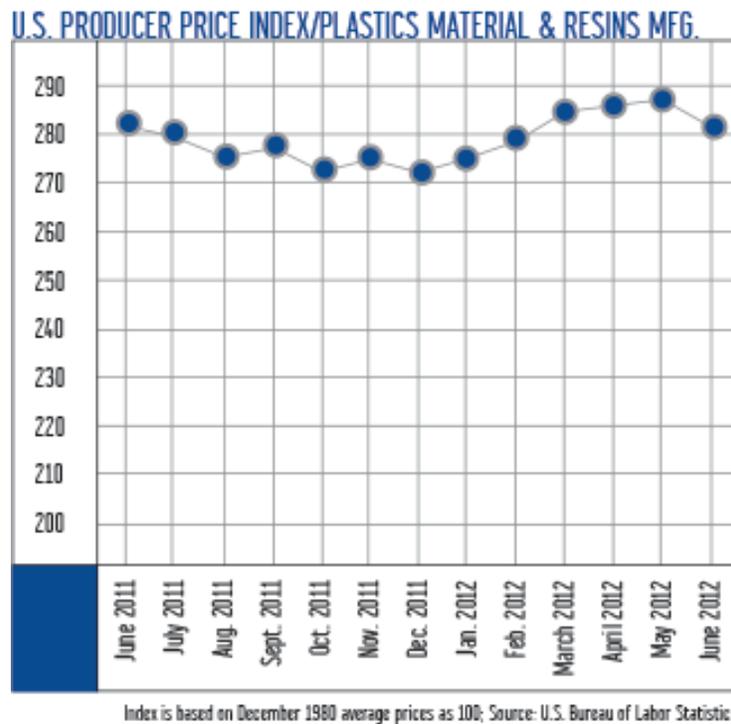
Plastics markets have experienced a fairly sharp downward trend over the past several months. Led by a slump in polyester, many plastic scrap grades have been hit by a combination of lower oil prices, a slumping economy throughout Europe and a slowing Chinese buyers' market.

China, which had been one of the driving forces for surging plastic scrap prices in 2011, is now becoming a much more difficult market to serve. Several reports note that Chinese customs agents are prohibiting many container shipments of plastic scrap, which is forcing more plastic scrap recyclers in Europe and the U.S. to redirect shipments to other destinations. Demand for mixed post-consumer plastic grades has fallen off quite significantly. This can be attributed to tighter regulations throughout Asia, as well as higher freight rates that are curbing the appetites of many potential consumers. Virgin LDPE prices have dropped significantly, while PET also has taken "a big hit."

On the other hand, the plastics reprocessing sector is characterized by strong domestic demand. However, finding raw material to meet customer demand can be challenging. Recovered PE (polyethylene) and PP (polypropylene) are moving well, though at lower prices than earlier this year. Demand for recycled PP continues despite a considerable decline in virgin PP prices. Pricing for virgin PP declined from 20 to 25 cents per pound. Post-industrial engineering grades were sliding slowly in price in mid-June, sources say, though pricing seems to have stabilized as of mid-July.

Declining oil prices, which correlate to virgin and recycled plastics pricing, do offer a benefit in the form of less expensive transportation. Pricing is more affordable and more trucks are available, now that demand from the produce industry is decreasing.

**Figure III: Producer Price Index: Plastics**



Predictably, demand for polyethylene terephthalate (PET) and high-density polyethylene (HDPE) remain highest among plastic grades. In addition to being reused for containers, these grades are in demand for such items as plastic decking material, plastic picnic benches, and outdoor seating. For other grades, such as low-density polyethylene and polypropylene (PP), the region doesn't have the regional demand. There are few established industries for PET and HDPE. Industries that demand PET include textiles and carpet; and a big market for HDPE is containers for consumer package goods such as laundry detergent bottles. A major user of recovered PET is Mohawk Industries, which manufactures carpeting. The Calhoun, GA-based company is a typical consumer of commodities, but focuses on local markets.

The other grades have smaller volumes and less availability. It's harder to process them off of a stream, and MRF technology has begun to improve to address these materials. Few MRFs are running near infrareds, not many MRFs are running optical sorters, and manual sorting is time-consuming and expensive as well. If you're not able to get much stuff out of the stream, it is not economical to sort it.

There is a shift from PET to PP in some non-bottle-grade materials. A major recent development that has increased PP use was Starbucks Coffee Co.'s switch from PET to PP for its cold cups. This change resulted from a study indicating that PP cups use 15% less plastic than PET cups and emit 45% fewer greenhouse gases during production. Additionally, they do not contaminate other PP containers when commingled for recycling and are easier to recycle than PET cups in most communities, according to Starbucks.

Similarly, glass is a regional product. Modern, high production bottle manufacturing requires very clean and uniform feedstock. Over the past decade there has been a growth in the glass beneficiation sector. These are intermediate processors that receive glass from recycling programs and run it through a series of steps to remove any contaminants (rocks, ceramics, metal caps, etc.) and provide a uniform feedstock to the bottle manufacturers. These reprocessors provide an excellent market for recycling programs that do not have the volume or ability to produce glass for direct mill delivery.

Glass beneficiation plants use sophisticated optical sorting machines to separate the glass into the three-color types. They may also x-ray the glass to detect any rocks or ceramics, which are then removed. Magnets and eddy current separators are used to remove magnetic and non-magnetic metal contamination from caps and lids. The end product is a uniformly sized load of ground glass that is free of contaminants readily acceptable by bottle manufacturers. Lower grades of recycled glass that are too mixed or contaminated, may be used in concrete or in road paving material called "Glassphalt".

Houston-based Strategic Materials has a large beneficiation facility on Chicago's South Side. Glass grades in the most demand include "flint," aka "clear," which is used for bottling such items as beer and pickles, followed by brown and green, the latter of which comes in a distant third in demand. Most MRFs in the area crush all three types of glass together for a "three-mix glass" that is shipped to a processor like Strategic Materials that separates the material optically. Glass is a "negative-value material but the cost to recycle the material is often lower than landfill tipping fees.

A development that is affecting glass recycling is the gradual elimination of glass for desktop computer monitors and television sets. One of the big challenges in the electronics industry is what to do with glass—it's a growing problem. Foreign countries such as India and Indonesia are major players in consumer electronics manufacturing and markets for recycled glass exports. Eventually, there will not be any more glass monitors; people will eventually purge them from their homes and offices and demand will dry up among manufacturers and recycled glass exporters alike.

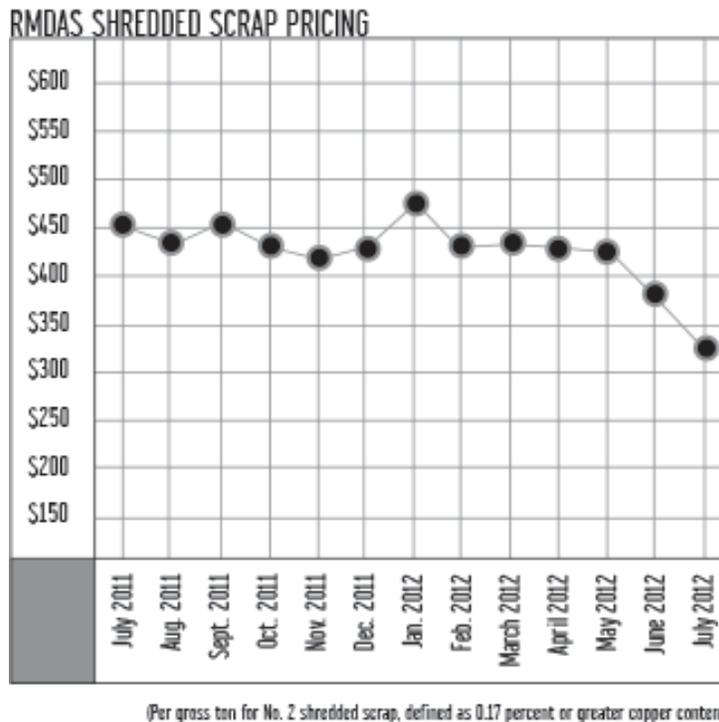
## DOWNWARD DEMAND CURVE - FERROUS

According to the monthly averages issued by the Raw Material Data Aggregation Service (RMDAS) of Pittsburgh-based Management Science Associates (MSA), prices for prompt industrial grades fell by an average of \$50 per ton on the spot market, while shredded scrap lost \$47 in value. The net result of the two consecutive monthly buying periods is a drop in the value of shredded scrap of nearly \$100 per ton—from \$437 in May 2012 to \$338 in July. Average national per-ton prices in the buying period, which included the last 10 days in June and the first 20 days in July, fell below \$350 per ton for all major ferrous grades.

Spot market prices in the North Midwest region (which consists of Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, Wisconsin, the Dakotas and the northwest corner of Indiana) are the lowest on average among the three RMDAS regions. Prices in the North Midwest finished the buying period with the RMDAS prompt industrial composite grade (consisting of No. 1 busheling, No. 1 bundles and No. 1 factory bundles) at \$333 per ton, while

No. 2 shredded scrap was valued at \$328 and No. 1 heavy melting steel fell to \$294. The \$294-per-ton price marked the first time a ferrous scrap average price for any grade in any region had fallen below \$300 per ton since 2010.

**Figure IV: Ferrous Scrap Pricing**



Recyclers contacted in mid-August are reporting positive signs in the ferrous scrap market after 60 troubling days. A scrap processor along the Atlantic coast says export buyers have begun making inquiries again and are offering prices above the U.S. mill spot market rate. He says the absence of export buyers has allowed domestic mills to bid down prices during the previous 60 days.

Steel mill output in the United States is beginning to show signs of decline. Steel output in 2012 in the United States, however, remains above the 2011 level. What the American Iron and Steel Institute (AISI), calls “adjusted year-to-date production” through July 14, 2012, was 52.93 million tons with a capability utilization rate of 77.9 percent. That is a 6.3 percent increase from the 50.72 million tons made during the same period last year, when the capability utilization rate was 74.5 percent.

Comparing June 2012 with June 2011, global steel output was relatively stable, dropping to 127.90 million metric tons in June 2012 from 127.99 million metric tons in June 2011. The monthly decrease, though mild, marks one of the few negative numbers in 2012, with much of the rest of the first half of the year having pointed to increased output. World crude steel production in the first six months of 2012 was 766.9 million metric tons, a slight increase of 0.9 percent compared to the same period of 2011. North America and Asia showed an increase of 7.2 percent and 1.6 percent respectively (U.S. 8.4 percent and China 1.8 percent), while the EU and South America recorded negative growth of -4.6 percent and -3.5 percent each.

**Table 2: July 2012 Spot Market Pricing**

	Total U.S.	North Central/ East	North Midwest	South
Prompt Industrial Composite	\$342	\$341	\$333	\$350
#1 HMS (Heavy Melting Steel)	\$308	\$307	\$294	\$318
#2 Shredded Scrap	\$338	\$340	\$328	\$345
#2 Shredded/Change vs. Month Before	-\$47	-\$49	-\$41	-\$43

Spot market prices for the three major grades fell \$42 to \$50 per ton, marking the second straight month of decline. Reported regional aggregated spot market prices per gross ton shown for each commodity are based on all Management Science Associates (MSA), Pittsburgh, Raw Material Data Aggregation Service (RMDAS) participants' actual order data submitted to and processed by MSA as of the 20th of each respective "buy month," rounded to the whole integer.

Heavy melting steel (HMS) or heavy melting scrap, is a designation for recyclable steel and wrought iron. No. 2 shredded scrap is defined as containing 0.17 percent or greater copper content. The prompt industrial composite consists of an average of No. 1 bundles, No. 1 busheling and No. 1 factory bundles.

A major consumer of the aluminum in the region is Anheuser-Busch, and much of its steel winds up in Illinois foundries. Aluminum demand is seasonal, spiking in the spring, declining in the fall, and spiking again around the holidays.

## THE ECONOMICS OF RECYCLING

Taking competitive bids for commodities as they become available can maximize prices that municipalities can receive for the recycled commodities. Many municipalities do not operate a MRF but use a contractor to process and market its recyclables. Municipalities often manage residential refuse collection.

Overall, the economics of recycling continue to work in favor of the communities and the refuse haulers. Arrangements with an area MRF in which haulers rebate communities based on the cost per ton using a blended commodities pricing index. Communities can choose to request MRF's to share in the market value of materials that are sold, as contracts are prepared. This is a typical practice when separate contracts are awarded for collection and for processing and marketing of materials. A revenue sharing arrangement provides an incentive for both the MRF to maintain high quality and market standards and for the community to encourage residents to participate in the recycling program and educate residents how materials should be set out to maximize the benefit of the program.

A market share arrangement generally includes an established floor price, which guarantees a minimum price per ton paid to the community for materials brought to the MRF. The floor price can be fixed based on the market value of a select number of items or the total mix of recyclable materials collected. When the market value of the recyclable tonnages exceeds the established floor price, the community and the MRF share in the value of the sold commodities, based upon an established percentage split.

## SLIDING RATES

Unlike fixed rate plans, some MRF's offer a sliding scale agreement. In this scenario, prices paid for each material increases or decreases in direct response to market fluctuations. How those rates are determined is important. In some sliding scale agreements, the rates are tied to published sources of market activity for the geographic region. Common examples of these publications include The Market Board: Yellow Sheet for the Chicago Market and The Secondary Materials Pricing by Region as published by Waste and Recycling News. The prices shown in these publications are examples of trends in the marketplace. They do not necessarily reflect actual prices negotiated by the local processor. Nevertheless, these sources provide a benchmark and an indication of shifts in the value of certain materials. Using public indexes can in some cases serve as an incentive to the local operator to obtain the best prices possible for the material delivered.

## ADJUSTED SLIDING RATES

A hybrid rate agreement includes components of fixed/flat rates and also the sliding scale approach. In this scenario, the MRF sets a flat processing fee for all material received. The processing fee is subsequently adjusted based on the composition and market prices for each commodity respectively. A greater percentage of the market price is allocated to the municipality and a lower percentage to the processor. When the market price results in a positive adjustment the municipality realizes a return on the sale of the recyclables. When the adjustment has a negative impact, the municipality pays the MRF for processing. This perhaps is one of the fairest approaches to revenue sharing. It offers the MRF assurance that it can cover the cost of processing during the course of the contract. It also provides the municipality with a greater direct share of the revenues.

As an example, the City of Minneapolis has an agreement with the MRF that processes their material, owned and operated by Allied Waste, that shares 85% of the revenue above a floor price for each commodity. The City of Cincinnati has a market share arrangement with their MRF, operated by Rumpke, which provides a floor price of \$85/ton. If the revenue from sale of the materials exceeds \$85/ton, 50% of the revenue above \$85/ton is shared with the city.

After accounting for negative-value glass and residue in the recycling stream, the blended value per ton, or Average Commodity Revenue value was estimated at \$115 per ton as of July 2012 in the northern Midwest region. With processing costs at about \$65 to \$85 a ton, communities often receive a rebate from the MRF when they deliver that material. MRF operations are usually covered by the tipping fee and receive additional compensation based on the prices for recyclables.

An analysis of the average commodity revenue (ACR) price approach to commodity sales is illustrated in the following table for several different periods over the past 4 years. During the first period from December 2008 to September 2009, the recession was in full swing but fiber prices had not yet fallen. The higher ACR basket price, therefore, relative to the second period (September 2009 to May 2010) was carried by the higher fiber prices. However, in the second period, container prices had started to recover while fiber prices dropped and due to the smaller portion of containers, the ACR price fell even though unit prices are considerably higher. The third period (January 2011 to November 2011) portrays overall higher prices and the considerably higher ACR price as a result of higher demand.

**Table 3: Average Commodity Revenue (ACR) Analysis**

Material	% of Stream	Dec 08 - Sep 09		Sep 09 - May 10		Jan 11 - Nov 11	
		Price	ACR Price	Price	ACR Price	Price	ACR Price
OCC	7.0%	\$108	\$7.58	\$44	\$3.09	\$150	\$10.51
ONP	30.0%	\$77	\$23.02	\$21	\$6.31	\$59	\$17.80
Mixed Paper	20.0%	\$82	\$16.31	\$28	\$5.52	\$80	\$16.02
SOP	2.0%	\$211	\$4.22	\$108	\$2.16	\$244	\$4.89
Magazines	10.0%	\$80	\$8.02	\$58	\$5.80	\$105	\$10.53
PET	5.0%	\$172	\$8.58	\$308	\$15.40	\$649	\$32.46
NHDPE	2.3%	\$369	\$8.49	\$531	\$12.21	\$736	\$16.93
CHDPE	2.4%	\$263	\$6.31	\$401	\$9.62	\$534	\$12.82
#1-7	1.8%			\$110	\$1.99	\$203	\$3.65
Cartons	1.1%						
Aluminum	1.4%	\$952	\$13.33	\$1,404	\$19.65	\$1,807	\$25.29
Steel Cans	6.0%	\$55	\$3.28	\$99	\$5.95	\$118	\$7.05
Other Ferrous	2.0%						
Film Plastic	0.0%						
Textile	4.0%						
Residue	5.0%	-33	\$(1.65)	-33	\$(1.65)	-33	\$(1.65)
ACR Price per Ton			\$97.49		\$86.06		\$156.31

The ACR contract approach is one of the best mechanisms for a community to hedge the risks of volatile swings in the value of recycled commodities. The approach provides flexibility and helps to maximize revenues. If a community wants a minimum guaranteed price, bidders would be tempering their bids with lower expectations in order to ensure that they're not incurring large losses in instances of a market depression.

## GLOBALIZATION OF RECYCLED COMMODITIES

Some recycled commodities are in demand locally, but adjusting operations to the trends of globalization of markets is a wise strategy for the future. Overall, despite the fact that prices generally are not quite as high for recycled commodities as a few years ago, Municipal Solid Waste (MSW) managers are still receiving decent revenue from fiber and plastics as the global market steadily grows. To take advantage of this growth, they would do well to invest in new equipment for their MRFs that will allow them to ship their commodities both locally and overseas.

The recycling industry has begun to capitalize on recent trends in markets by investing in high-density balers for fiber. High-density balers are used to ship recovered paper over long distance, including internationally. Material has to be as dense as possible to keep the transportation costs down. Given the fact that the US market buys products from China and elsewhere in Asia, the containers have to return there for reuse and recycled into new packaging. Backhaul freights are quite low and a very efficient global shipping industry emerged over the past 25 years to enable this to occur.

Residential paper is now processed over disk screens and enough OCC is recovered to make it worthwhile. More processors are thinking about investing in optical sorters for paper because, often, there is enough office paper in the residential stream to justify the investment. This lower-quality recycled paper lends itself to being recycled in new state-of-the-art Chinese mills that have been designed to use dirtier materials than many older US mills. Also, there is a move toward recycling paper from office buildings in a single stream system. Any increase in residential paper use is not even coming close to a major reduction in paper use among both offices and the printing industry that is due to the rise in electronic communication.

Overall, all signs point toward increasing global demand for recycled paper in the coming years as new uses for polycoated paper grades emerge for such packaging as aseptic juice boxes. Single-stream recycling will continue to grow in use as more uses like these emerge. The demand is there; in some ways it will be a supply-short market for the next five or 10 years.

## LIST OF ACRONYMS

ACR	Average Commodity Revenue
GLASS- GR	Green
GLASS-BR	Brown
GLASS-CL	Clear
HMS	Heavy Melting Steel
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
OBM	Official Board Market
OCC	Old Corrugated Cardboard
OMG	Old Magazines
ONP	Old Newspaper
OTD	Old Telephone Directory
HDPE PIG	High Density Polyethylene Pigmented
PET	Polyethylene terephthalate
HDPE NATURAL	High Density Polyethylene
PP	Poly Propylene
RMP	Residential Mixed Paper