



The Aluminum Can Advantage Key Sustainability Performance Indicators June 2016

Introduction

As the leading voice for the aluminum industry in North America, the Aluminum Association is committed to providing up-to-date, complete and accurate information on industry sustainability. To that end, we are releasing a comprehensive report on key sustainability performance indicators (KPI) for one of our best-known and widely used consumer products – the aluminum can.

Aluminum can scrap is a vital input for the industry and allows can manufacturers to make beverage containers in the most environmentally friendly and economical way possible. It takes just 8 percent of the energy to produce aluminum from recycled material versus producing new aluminum.¹

In addition, the infinite recyclability of aluminum and the high value of the material means that, unlike competing packages like glass and plastic bottles, the aluminum used beverage container (UBC) is most often recycled directly back into itself. This process occurs over and over again without degradation in product quality – meaning that a used beer or soda can is recycled and back on the shelves within 60 days. This closed-loop process drives a virtuous cycle of high recycling rates, a large percentage of recycled content in the average aluminum can and an economically sustainable process that effectively subsidizes municipal recycling programs nationwide.

In partnership with our member companies – which are responsible for all of the aluminum can sheet production and most of the aluminum UBC recycling in the United States today – the Aluminum Association has developed data as well as comparative information to provide a complete picture of the aluminum can's sustainability performance. The indicators include:

- **Industry Recycling Rate:** Measures the amount of used aluminum can scrap recycled by U.S. aluminum producers as a percentage of cans shipped. This rate provides a measure of industry efficiency relative to overall can shipments. This rate includes both domestic and imported can scrap from foreign countries that is reclaimed by U.S. producers as well as cans that are exported and recycled overseas.
- **Consumer Recycling Rate:** Measures the amount of aluminum can scrap generated domestically and recycled as a percentage of cans shipped domestically. The consumer recycling rate indicates how well consumer recycling programs are working to capture cans after use and how much aluminum can scrap is either landfilled or otherwise unaccounted for. This rate excludes can scrap imported and exported in order to provide a more accurate representation of U.S. consumer recycling behavior.
- **Recycled Content:** Measures the proportion of recycled aluminum versus virgin aluminum in the average aluminum can. The recycled content rate is one indicator of environmental stewardship of the aluminum can.

¹ http://www.aluminum.org/sites/default/files/LCA_Report_Aluminum_Association_12_13.pdf

- **Value of Material:** Measures the dollar value per ton of aluminum can scrap. The value of material measure indicates the relative importance of different materials commonly found in the recycling bin to sustaining the financial viability of municipal recycling programs. The data is based on a two-year rolling average of commodity prices for competing material types.
- **Weight:** Measures the weight of the average aluminum can. This measure is an indicator of overall material efficiency and functionality for beverages packaged in aluminum cans. Producing a lighter container for the same volume of beverage indicates significant engineering improvements in can making and efficiency improvements in source reduction and material utilization.

Summary Results

Following are top-level results for key sustainability performance indicators of the aluminum can compared to other beverage packaging options.

	Aluminum Cans	Glass Bottles	Plastic Bottles (PET)
Industry Recycling Rate²	64.3%	N/A	N/A
Consumer Recycling Rate³	54.5%	41.3%	31.0%
Recycled Content⁴	70%	23%	3%
Value of Material⁵	\$1,367/ton	\$0/ton	\$310/ton

² No equivalent data available for glass or plastic bottles.

³ Data for glass and plastic via the Environmental Protection Agency (EPA) “Advancing Sustainable Materials Management 2013 Fact Sheet”: https://www.epa.gov/sites/production/files/2015-09/documents/2013_advncng_smm_fs.pdf and “NAPCOR Postconsumer PET Container Recycling Activity in 2014” report: http://www.napcor.com/pdf/NAPCOR_2014RateReport_FINAL.pdf. This is the latest publicly available information for glass and plastic. The EPA report typically lags for about 2 years in terms of latest available statistics.

⁴ Data for all three containers have not changed since the 2015 KPI report. Data for glass and plastic via the Environmental Protection Agency (EPA) Individual Waste Reduction Model (WARM): <http://epa.gov/epawaste/conserva/tools/warm/pdfs/Glass.pdf> <http://epa.gov/epawaste/conserva/tools/warm/pdfs/Plastics.pdf>

⁵ Data based on a two-year rolling average of commodity prices from February 2014 – February 2016 for various material types via <http://recyclingmarkets.net/>.

Industry Recycling Rate

Background

The industry recycling rate indicates the amount of aluminum can scrap recycled by U.S. aluminum producers as a percentage of finished cans shipped by the industry during a one-year time period. In basic terms, the rate provides an indication of industry stewardship and efficiency in managing the metal. This rate includes imported can scrap as well as cans that are exported and recycled overseas. Imports in particular have become an increasingly important feedstock for U.S. can recyclers in recent years. The quantity of scrap recycled is measured directly at the point where processed UBCs are fed into melting furnaces. This means that the aluminum is truly recycled.

Also, aluminum cans are most often recycled in a “closed loop” while glass and plastic are often down-cycled into other products such as road pavement or carpet fiber. Though the recycled material in these cases is diverted into another product for some period of time, it will ultimately end up in the landfill. Aluminum, by contrast, is generally recycled directly back into itself and, accordingly, never has to end up in a landfill.

The industry recycling rate declined by about 2 percent in 2015, largely as a result of a year-over-year drop in the volume of UBCs consumed by the domestic industry. In 2014, the U.S. aluminum industry recycled around 1.70 billion pounds of aluminum cans compared to 1.63 billion pounds in 2015 – a 4 percent drop and the lowest volume since 2009. The decline is likely the result of a global drop in scrap commodity prices in 2015, which included aluminum. The industry recycling rate remains above the ten-year average of 60.4 percent.

Methodology

The Aluminum Association industry recycling rate is based on survey input of UBC melting facilities including can sheet producers, can manufacturers and secondary producers of aluminum, representing nearly all can recycling activity in the United States. The calculation to determine the rate is as follows:

$$\frac{(\text{Pounds of UBC Melted Domestically}^6 + \text{Pounds of UBC Exports}^7)}{\text{Pounds of Cans Shipped by U.S. Producers}^8} =$$

$$\frac{\text{Pounds of Cans Recycled by Industry}}{\text{Pounds of Cans Shipped by U.S. Producers}} =$$

$$\frac{\mathbf{1.625 \text{ Billion Pounds of Cans Recycled}}}{\mathbf{2.529 \text{ Billion Pounds of Cans Shipped}}} = \mathbf{64.3\%}$$

⁶ Input weight of used beverage can scrap melted during the year. Figures derived from survey of aluminum mills and secondary producers conducted by Aluminum Association and Institute of Scrap Recycling Industries. Estimated full coverage. Includes imported UBCs since mills purchase scrap from scrap processors, brokers and traders who do not identify source.

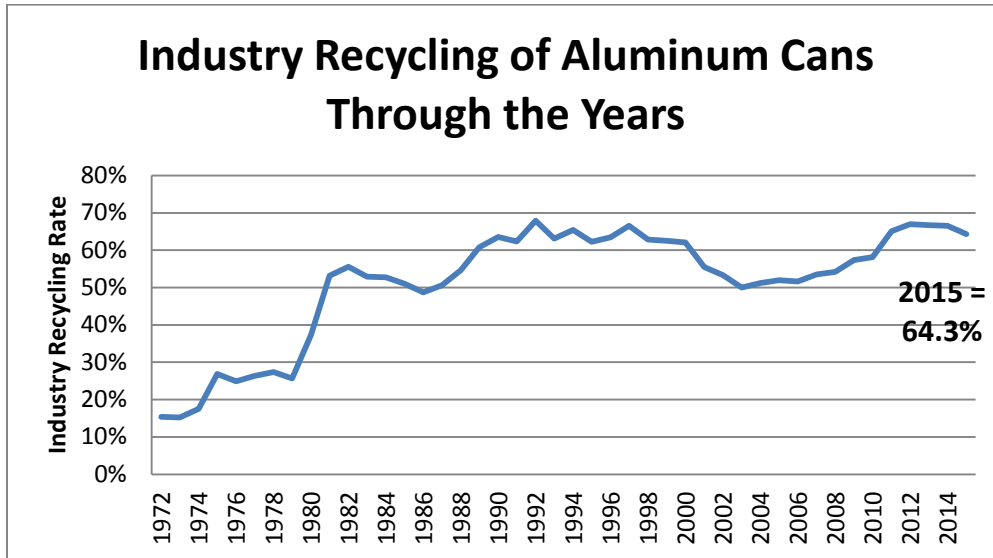
⁷ Foreign Trade Division. U.S. Bureau of the Census, U.S. Department of Commerce. Trade statistics derived from U.S. Customs reports. HTS 7602000030: Aluminum beverage container scrap. HTS 7612901030: Aluminum cans of a capacity not exceeding 355 ml.

⁸ Survey of U.S. can manufacturers conducted by Can Manufacturers Institute. Reported shipments of aluminum beverage cans lagged one quarter. Estimated full coverage - Includes exports.

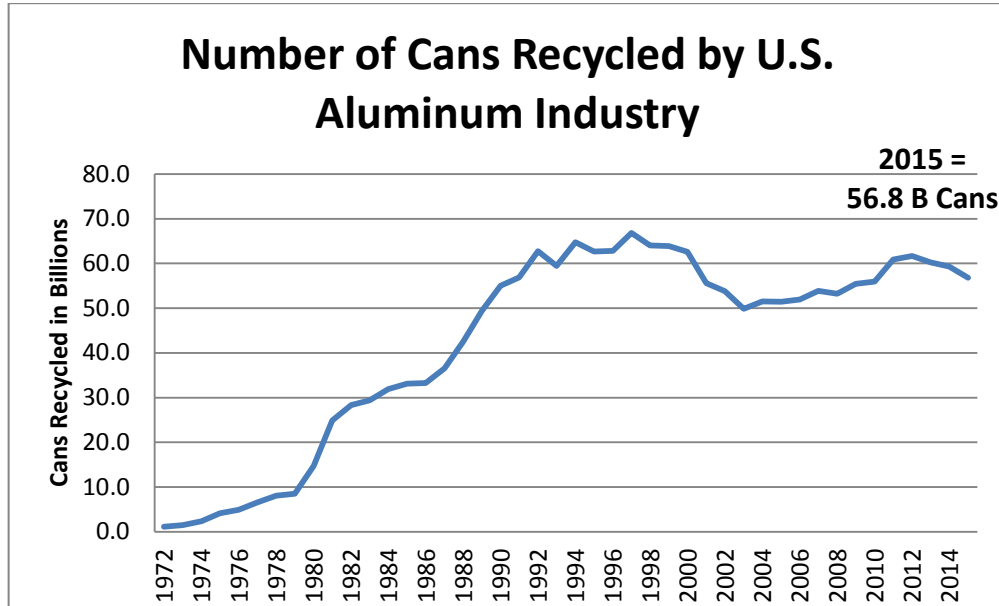
Industry Recycling Rate Calculation History

	2010	2011	2012	2013	2014	2015
Pounds of UBC Melted Domestically (MMlbs)	1,567.9	1,669.2	1,664.0	1,658.4	1,637.3	1480.0
+ Pounds of UBC Exports (MMlbs)	61.7	92.8	108.7	62.9	62.2	145.1
= Pounds of Cans Recycled (MMlbs)	1,629.6	1,762.0	1,772.8	1,721.4	1,699.4	1,625.1
/ Pounds of Cans Shipped by U.S. Producers (MMlbs)	2,804.9	2,708.4	2,644.0	2,581.3	2,555.7	2,528.7
= Industry Recycling Rate	58.1%	65.1%	67.0%	66.7%	66.5%	64.3%

Charts & Graphs



The aluminum industry recycling rate has risen steadily over the last 40 years. The rate was 15.4 percent when first reported in 1972. While the industry rate declined slightly in 2015, it remains well above the 10-year average of 60.4 percent



Since tracking began in 1972, the aluminum industry has recycled nearly 1.9 trillion aluminum beverage cans.

Consumer Recycling Rate

Background

The consumer recycling rate provides a measure of the amount of *domestic* aluminum can scrap recycled as a percentage of cans shipped in the U.S. during a one-year time period. This rate excludes can scrap imported from foreign countries to provide a more accurate representation of consumer recycling behavior in the United States.

The rate provides a snapshot of how well municipal recycling programs are performing nationwide. The consumer recycling rate also indicates the amount of aluminum cans that find their way to the landfill every year instead of being responsibly recovered.

In 2015, 38.9 billion cans – nearly \$760 million worth of aluminum -- were diverted from the recycling stream and ended up in landfills. These landfilled cans, which could otherwise have been recycled and made into new cans, have a significant negative impact on the environment through wasted energy and on the economy through lost jobs.

Methodology

The Aluminum Association consumer recycling rate is based on survey input from can sheet producers, can manufacturers and secondary producers of aluminum, representing nearly all can recycling activity in the United States. The calculation to determine the rate is as follows:

$$\frac{(\text{Pounds of UBC Melted Domestically}^6 + \text{Pounds of UBC Exports}^7 - \text{Pounds of UBC Imports}^7)}{(\text{Pounds of Cans Shipped by U.S. Producers}^8 - \text{Pounds of Exported Unfilled Cans}^7 + \text{Pounds of Imported Unfilled Cans}^7)}$$

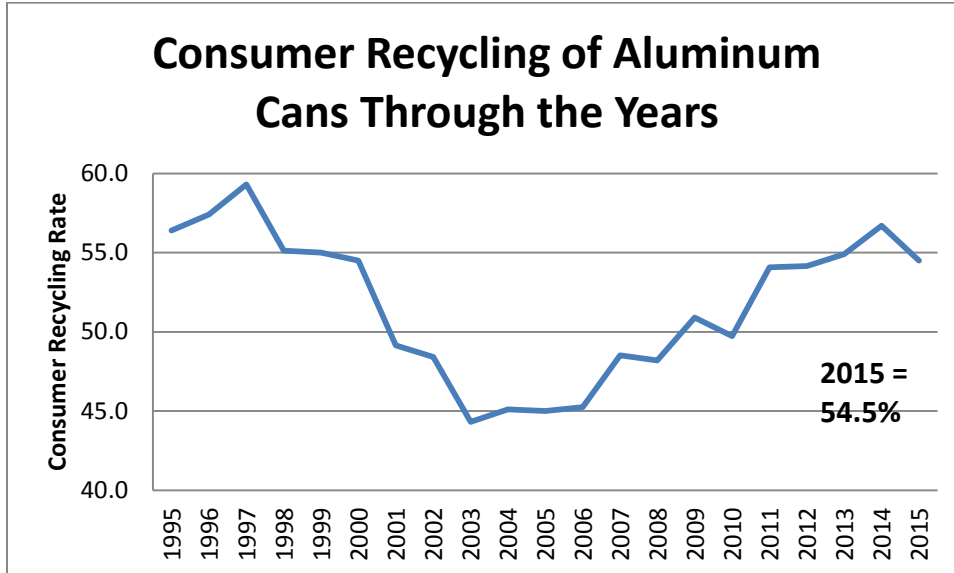
$$\frac{\text{Pounds of Cans Recycled by U.S Consumers}}{\text{Pounds of Cans Shipped Corrected for Imports \& Exports}}$$

$$\frac{\mathbf{1.334 \text{ Billion Pounds of Cans Recycled by U.S. Consumers}}}{\mathbf{2.445 \text{ Billion Pounds of Cans Shipped Corrected for Imports \& Exports}}} = \mathbf{54.5\%}$$

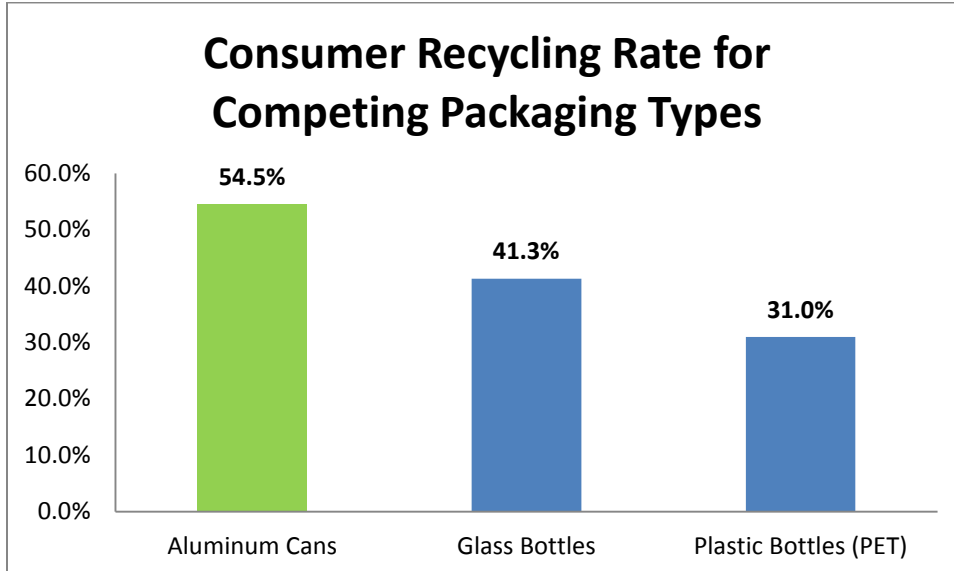
Consumer Recycling Rate Calculation History

	2010	2011	2012	2013	2014	2015
Pounds of UBC Melted Domestically (MMlbs)	1,567.9	1,669.2	1,664.0	1,658.4	1,637.3	1,480.0
+ Pounds of UBC Exports (MMlbs)	61.7	92.8	108.7	62.9	62.2	145.1
- Pounds of UBC Imports (MMlbs)	262.8	329.7	367.8	333.1	286.8	291.6
= Pounds of Cans Recycled by U.S. Consumers (MMlbs)	1,366.8	1,432.3	1,405.0	1,388.2	1,412.7	1,333.5
/ Pounds of Cans Shipped by U.S. Producers (MMlbs)	2,804.9	2,708.4	2,644.0	2,581.3	2,555.7	2,528.7
- Pounds of Exported Unfilled Cans (MMlbs)	86.9	76.4	69.8	67.3	82.0	100.8
+ Pounds of Imported Unfilled Cans (MMlbs)	30.5	16.2	19.9	14.8	17.0	17.2
= Pounds of Cans Shipped Corrected for Imports & Exports (MMlbs)	2,748.6	2,648.2	2,594.2	2,528.9	2,490.6	2,455.1
= Consumer Recycling Rate	49.7%	54.1%	54.2%	54.9%	56.7%	54.5%

Charts & Graphs



Following a period of decline from the mid-1990s to early 2000s, the consumer recycling of aluminum cans has grown significantly. Since lows reported in 2003, consumer recycling has grown by more than 10 points.



The aluminum can is by far the most recycled beverage container by consumers. The closed loop nature of aluminum can recycling, and the metal's inherent high value in the recycling stream, drive a virtuous environmental and economic cycle.

Recycled Content

Background

Recycled content data measures the proportion of recycled aluminum versus new or virgin aluminum in the average aluminum can. High recovery rates for aluminum along with the closed loop nature of can recycling truly sets the aluminum can apart as a sustainable package type. In contrast to glass and plastic bottles, a large percentage of the average aluminum can is made from recycled material.

The high recycled content in the average aluminum can is an indicator of environmental stewardship of the package.

The recycled content of the can contains metal from both post-consumer and post-industrial scrap sources. However, the calculation excludes internal run-around scrap metal (metal generated during a manufacturing process that is subsequently recycled on-site).

The Association's recycled content figure follows the guidelines and definitions laid out by the Federal Trade Commission (FTC) "Green Guides" as well as UL Environment, an environmental label certification company. The approach also aligns with ISO compliance according to the 14021 standard in section 7.8.1.

Methodology

The Aluminum Association recycled content figure for the aluminum can is based on a survey of the five main producers of aluminum can sheet in the United States – Alcoa, Logan, Novelis, Tri-Arrows and Wise. These companies provide data to determine the composition of an average aluminum can. The time period for the survey data was 2012.

This survey is conducted by the Aluminum Association every 4 to 5 years. The previous figure was calculated using 2007 data and found a 68 percent total recycled content figure for the average aluminum can. This compares to an average of 23 percent recycled content for glass and 3 percent recycled content for plastic (PET) according to EPA estimates.⁴ Results from the latest aluminum can recycled content survey are reflected below:

13 grams (Average aluminum can weight):

3.9 grams = Primary aluminum⁹ = 30%

5.6 grams = Post-consumer scrap¹⁰ = 43%

3.5 grams = Post-industrial scrap¹¹ = 27%

Recycled Content = 70%

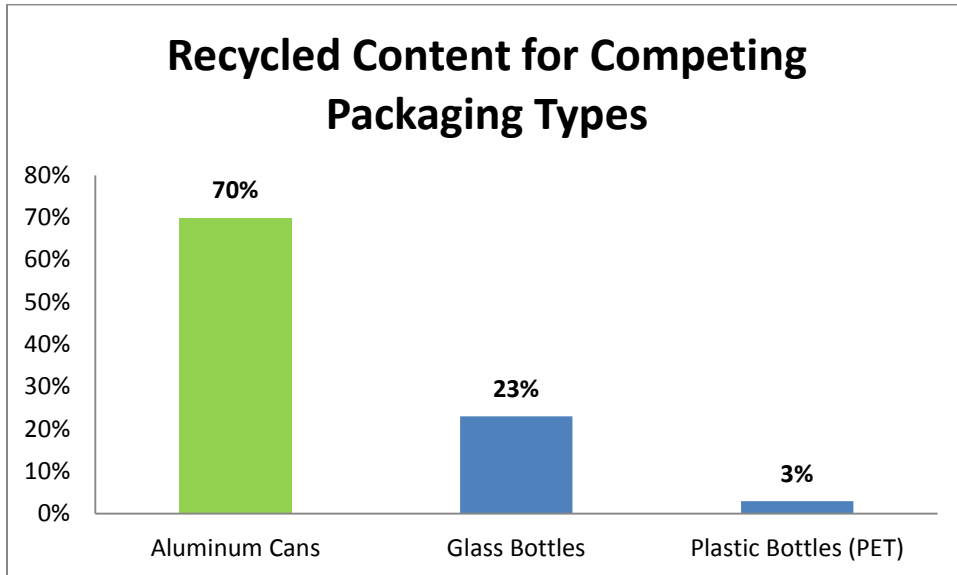
More detail on the calculation methodology is available at www.aluminum.org/sustainabilityreports.

⁹ Newly produced aluminum.

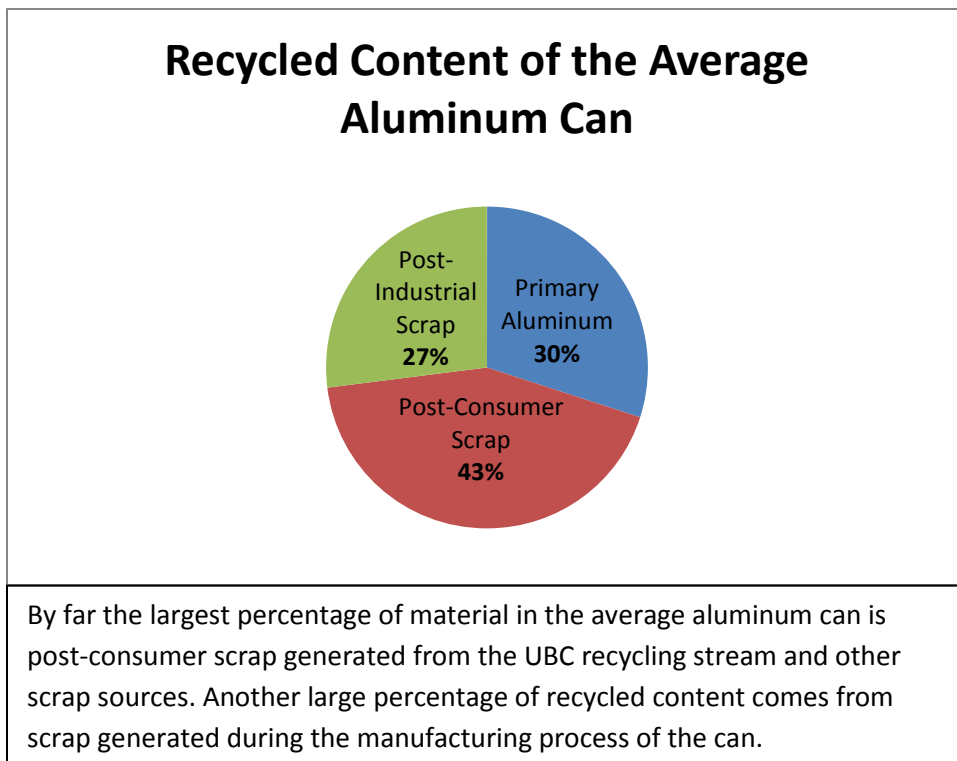
¹⁰ UBC and other scrap from the consumer waste stream.

¹¹ Scrap generated and recycled back into the manufacturing process.

Charts & Graphs



The high recycling rates and closed loop nature of aluminum can recycling mean that aluminum cans contain far more recycled content than competing packaging types. Unlike other package types, aluminum cans are most often recycled directly back into themselves – in as few as 60 days.



By far the largest percentage of material in the average aluminum can is post-consumer scrap generated from the UBC recycling stream and other scrap sources. Another large percentage of recycled content comes from scrap generated during the manufacturing process of the can.

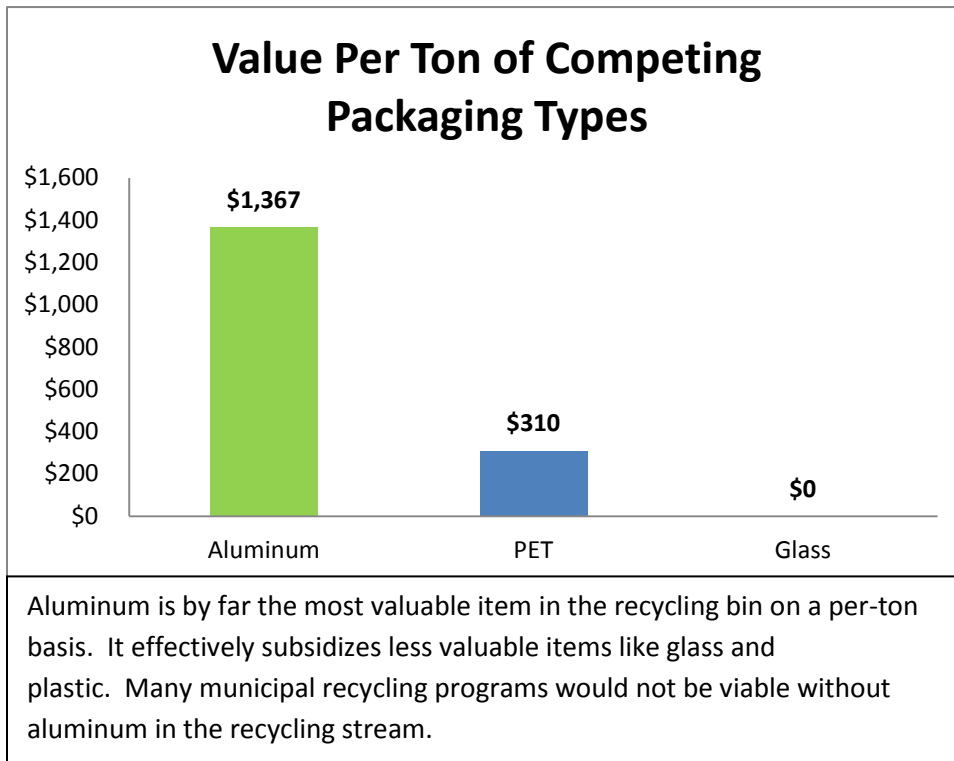
Value of Material

Background

The value of material data measures the dollar value of aluminum can scrap. Many municipal recycling programs rely on re-selling the material collected in curbside bins to help subsidize their programs. The high value of aluminum in the scrap stream means that, without it, very few curbside pickup programs would be financially viable.

Methodology

This data is based on a two-year rolling average of commodity prices from February 2014 – February 2016 for various material types via <http://recyclingmarkets.net/>.



Weight

Background

Since 1972, the Aluminum Association, in partnership with the Can Manufacturers Institute, has released data on the weight of the average aluminum can. During the time period, the weight of the average can has declined by 38 percent due to improved production processes and efficiencies. Producing a lighter container for the same volume of beverage indicates significant engineering improvements in can making and efficiency improvements in material utilization.

The weight reduction allows beverage makers to ship cans more efficiently. In fact, the reduction in can weight translates into both transportation energy and cost savings for beverage brands that package their products in cans.

Methodology

Prior to 1989, the average weight of an aluminum can was based on an Aluminum Association can weight survey. Since 1989, the data is based on a survey conducted by the [Can Manufacturers Institute](#).

