



Sustainability Key Performance Indicators Aluminum Beverage Can December 2014

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 sustainability key 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 environmental 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	66.7%	N/A	N/A
Consumer Recycling Rate³	54.9%	34.1%	31.2%
Recycled Content⁴	70%	23%	3%
Value of Material⁵	\$1467/ton	\$0/ton	\$420/ton
Weight (per container)⁶	12.98 grams	200 grams	25.20 grams
Weight (per oz of beverage)⁷	1.08 grams	16.67 grams	1.26 grams

² No equivalent data available for glass or plastic bottles.

³ Data for glass and plastic via the Environmental Protection Agency (EPA) Municipal Solid Waste Report 2012: http://www.epa.gov/osw/nonhaz/municipal/pubs/2012_msw_fs.pdf and “NAPCOR Postconsumer PET Container Recycling Activity in 2013” report: http://www.napcor.com/pdf/NAPCOR_2013RateReport-FINAL.pdf

⁴ Data for glass and plastic via the Environmental Protection Agency (EPA) Individual Waste Reduction Model (iWARM): <http://epa.gov/epawaste/conserves/tools/warm/pdfs/Glass.pdf> <http://epa.gov/epawaste/conserves/tools/warm/pdfs/Plastics.pdf>

⁵ Data based on a two-year rolling average of commodity prices from February 2012 – February 2014 for various material types via <http://recyclingmarkets.net/>.

⁶ Weights based on 12-oz aluminum can; 12-oz glass bottle; 20-oz plastic (PET) bottle. Aluminum data from the Can Manufacturers Institute. Plastic data from EPA EPA Individual Waste Reduction (iWARM) model: <http://www.epa.gov/epawaste/conserves/tools/iwarm/index.htm> Glass Data from Owens-Illinois Product Catalog: http://www.o-i.com/uploadedFiles/Pages/North_America/Product_Solutions/Beer%20Quick%20Reference.pdf

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 which has 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 pavements or carpet fiber. Though the recycled material in these cases is diverted into another product for some 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.

Because of the closed loop nature of aluminum can recycling, and aluminum’s high inherent value in the recycling stream, used cans easily cross borders and are extremely attractive for recycling. The increase in the industry recycling rate in recent years has been driven largely by more imported cans entering the recycling stream from Canada, Mexico, Saudi Arabia and other countries. In 2013 alone, the industry imported and recycled 11.6 billion cans, up 62 percent from just five years ago.

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:

$$\frac{(\text{Pounds of UBC Melted Domestically}^8 + \text{Pounds of UBC Exports}^9)}{\text{Pounds of Cans Shipped by U.S. Producers}^{10}} =$$

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

$$\frac{\mathbf{1.72 \text{ Billion Pounds of Cans Recycled}}}{\mathbf{2.58 \text{ Billion Pounds of Cans Shipped}}} = \mathbf{66.7\%}$$

⁷ Calculated based on Can Manufacturers Institute and EPA data.

⁸ 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. Includes imported UBCs since mills purchase scrap from scrap processors, brokers and traders.

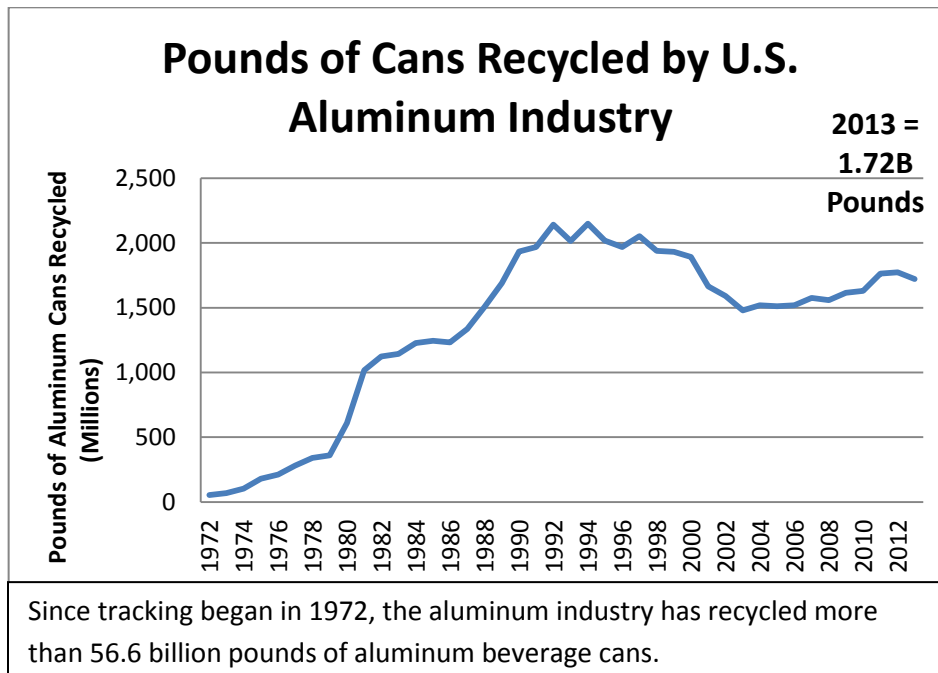
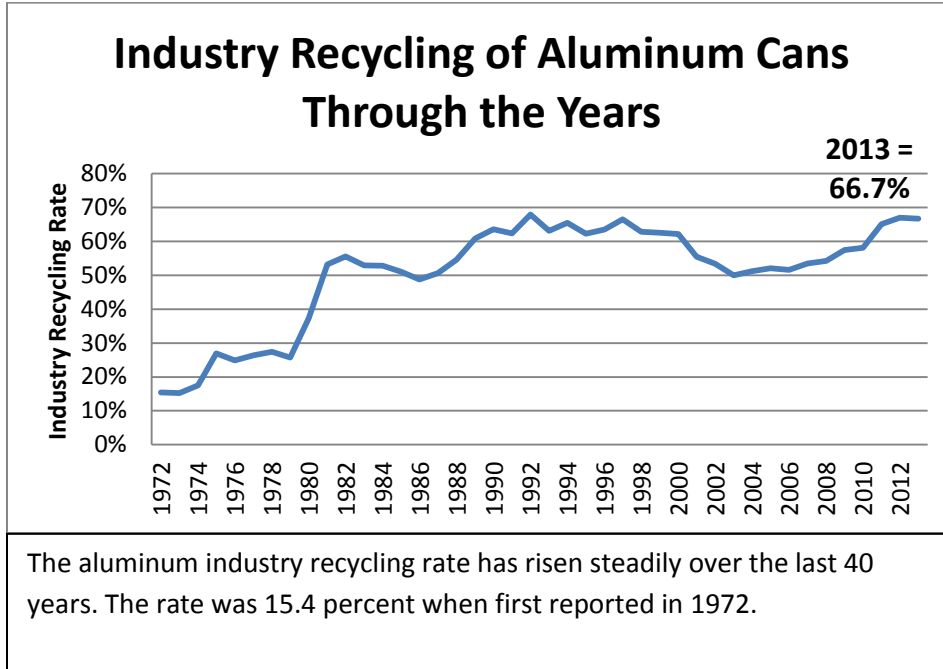
⁹ Foreign Trade Division. U.S. Bureau of the Census, U.S. Department of Commerce. Trade statistics derived from U.S. Customs reports. HTS 7602000030: Aluminum beverage container scrap. HTS 7612901030: Aluminum cans of a capacity not exceeding 355 ml.

¹⁰ 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.

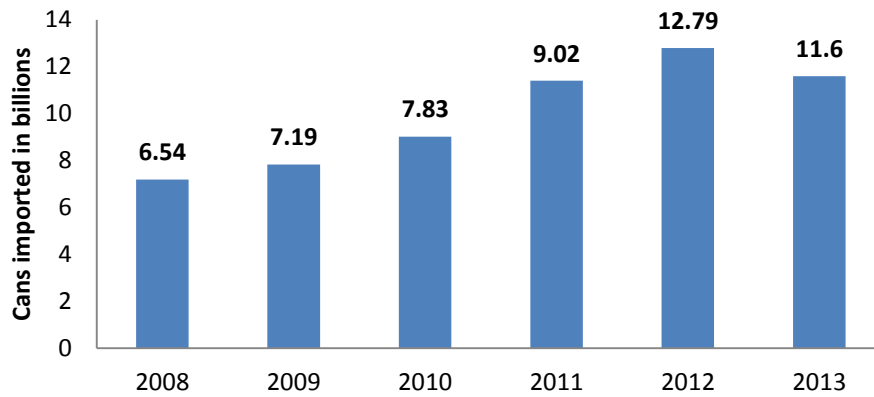
Industry Recycling Rate Calculation History

	2009	2010	2011	2012	2013
Pounds of UBC Melted Domestically (MMlbs)	1,575.9	1,567.9	1,669.2	1,664.0	1,658.4
+ Pounds of UBC Exports (MMlbs)	38.3	61.7	92.8	108.7	62.9
= Pounds of Cans Recycled (MMlbs)	1,614.3	1,629.6	1,762.0	1,772.8	1,721.4
/ Pounds of Cans Shipped by U.S. Producers (MMlbs)	2,812	2,805	2,708	2,644	2,581
= Industry Recycling Rate	57.4%	58.1%	65.1%	67.0%	66.7%

Charts & Graphs



Number of Cans Imported by U.S. Industry



The increase in the U.S. industry recycling rate in recent years has been driven largely by the addition of imported cans into the recycling stream. In 2013 alone, the industry imported and recycled 11.6 billion cans, up 62 percent from just five years ago.

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 2013, \$812 million worth of aluminum cans 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:

$$\frac{(\text{Pounds of UBC Melted Domestically} + \text{Pounds of UBC Exports} - \text{Pounds of UBC Imports}^{11})}{(\text{Pounds of Cans Shipped by U.S. Producers} - \text{Pounds of Exported Unfilled Cans}^{11} + \text{Pounds of Imported Unfilled Cans}^{11})} =$$

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

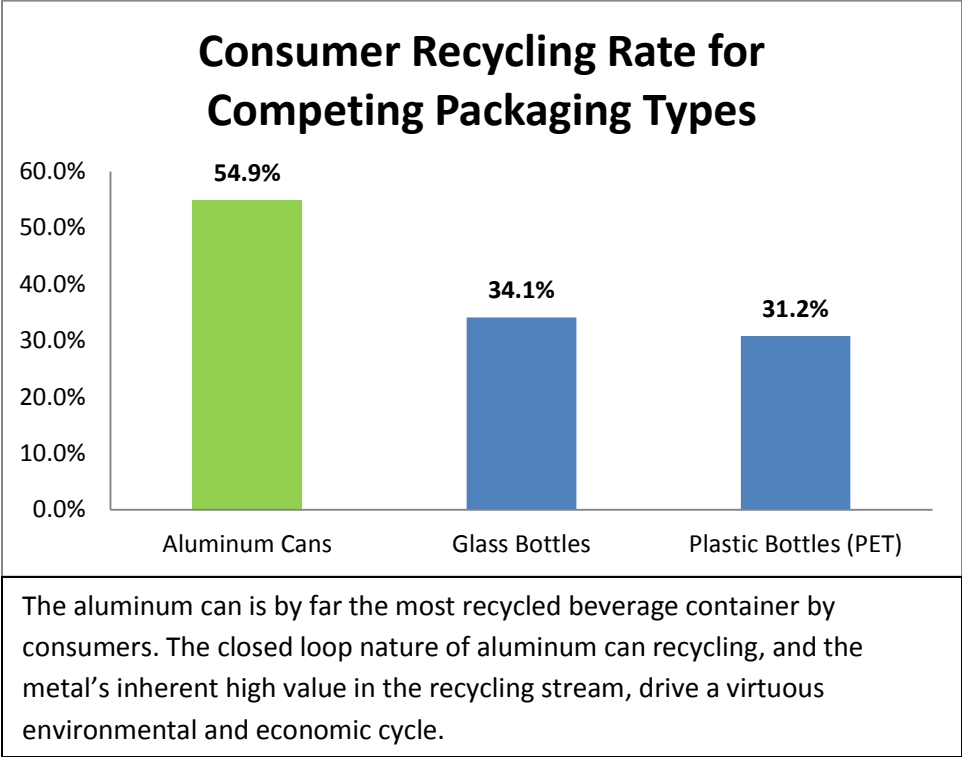
$$\frac{\mathbf{1.39 \text{ Billion Pounds of Cans Recycled}}}{\mathbf{2.53 \text{ Billion Pounds of Cans Shipped}}} = \mathbf{54.9\%}$$

¹¹ 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.

Consumer Recycling Rate Calculation History

	2009	2010	2011	2012	2013
Pounds of UBC Melted Domestically (MMlbs)	1,575.9	1,567.9	1,669.2	1,664.0	1,658.4
+ Pounds of UBC Exports (MMlbs)	38.3	61.7	92.8	108.7	62.9
- Pounds of UBC Imports (MMlbs)	228.1	262.8	329.7	367.8	333.1
= Pounds of Cans Recycled by U.S. Consumers (MMlbs)	1,386.2	1,366.8	1,432.3	1,405.0	1,388.2
/ Pounds of Cans Shipped by U.S. Producers (MMlbs)	2,812	2,805	2,708	2,644	2,581
- Pounds of Exported Unfilled Cans (MMlbs)	116.6	86.9	76.4	69.8	67.3
+ Pounds of Imported Unfilled Cans (MMlbs)	27.2	30.5	16.2	19.9	14.8
= Pounds of Cans Shipped Corrected for Imports & Exports (MMlbs)	2,723	2,749	2,648	2,594	2,529
= Consumer Recycling Rate	50.9%	49.7%	54.1%	54.2%	54.9%

Charts & Graphs



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 Guide" 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. Results from the latest survey are reflected below:

13 grams (Average aluminum can weight):

3.9 grams = Primary aluminum¹² = 30%

5.6 grams = Post-consumer scrap¹³ = 43%

3.5 grams = Post-industrial scrap¹⁴ = 27%

Recycled Content = 70%

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

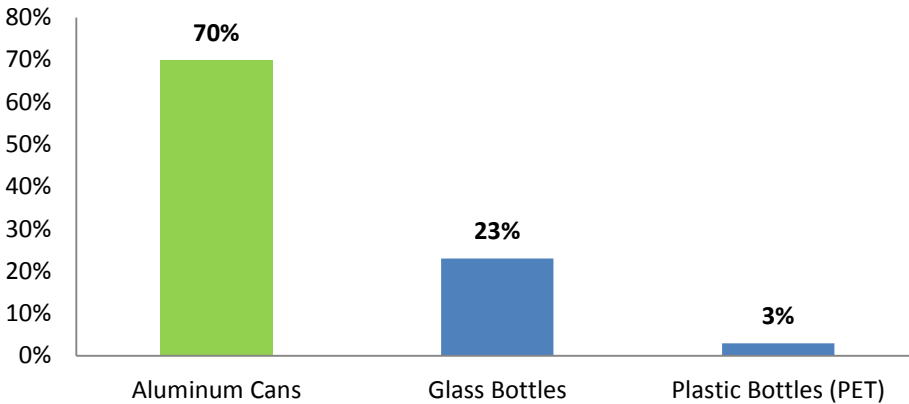
¹² Newly produced aluminum.

¹³ UBC and other scrap from the consumer waste stream.

¹⁴ Scrap generated and recycled back into the manufacturing process.

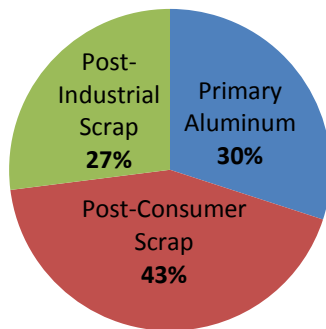
Charts & Graphs

Recycled Content for Competing Packaging Types



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.

Recycled Content of the Average Aluminum Can



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.

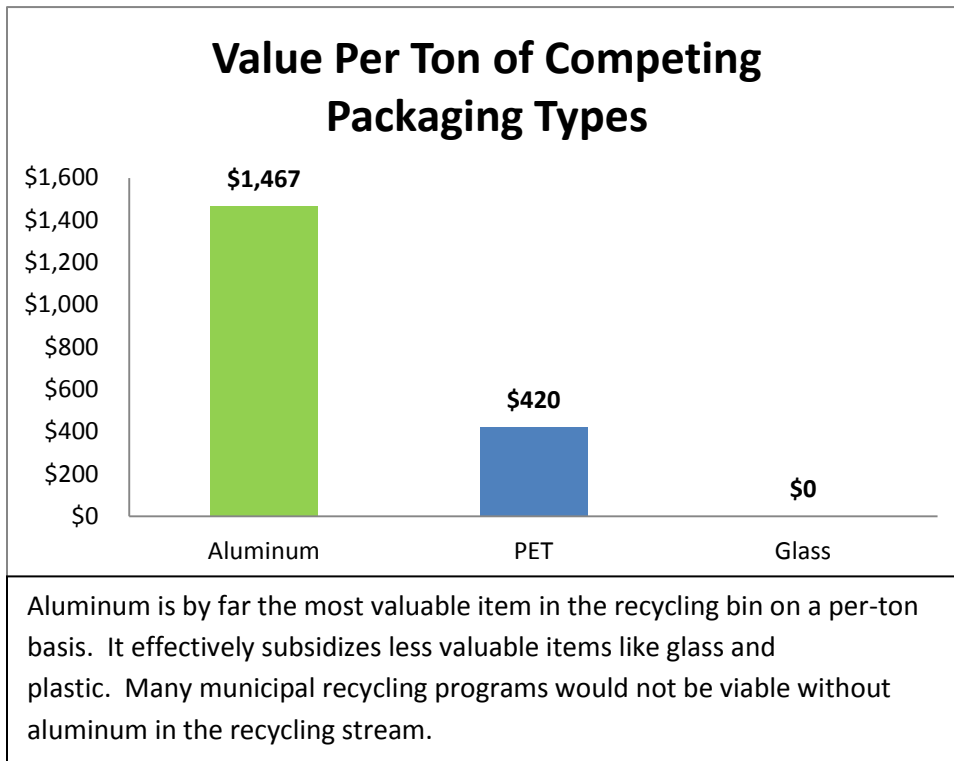
Value of Material

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 2012 – February 2014 for various material types via <http://recyclingmarkets.net/>.



Weight

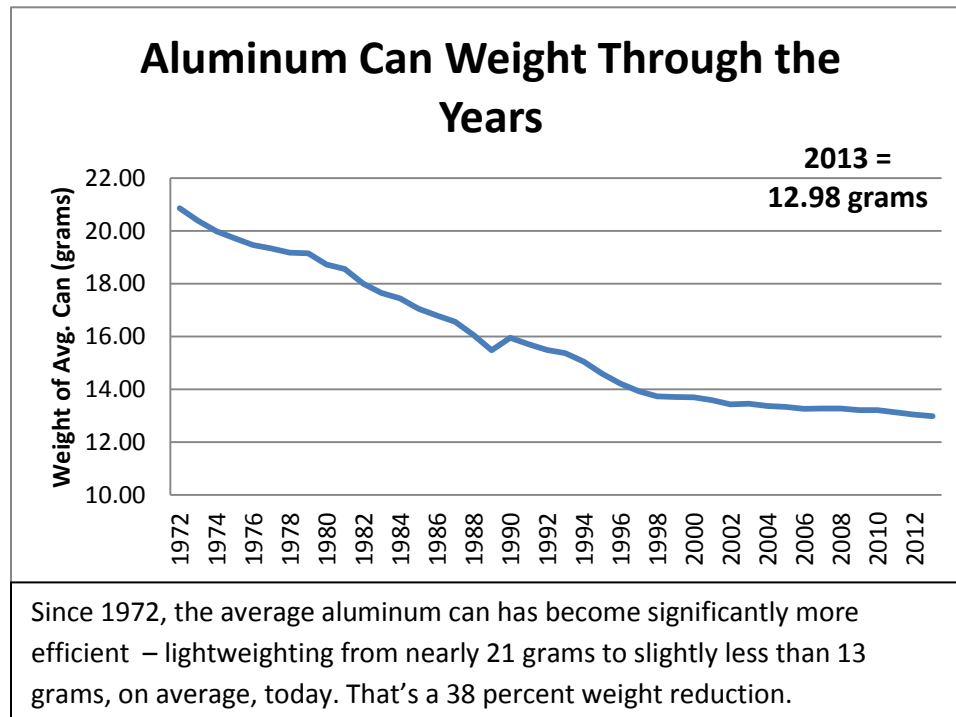
Background

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.

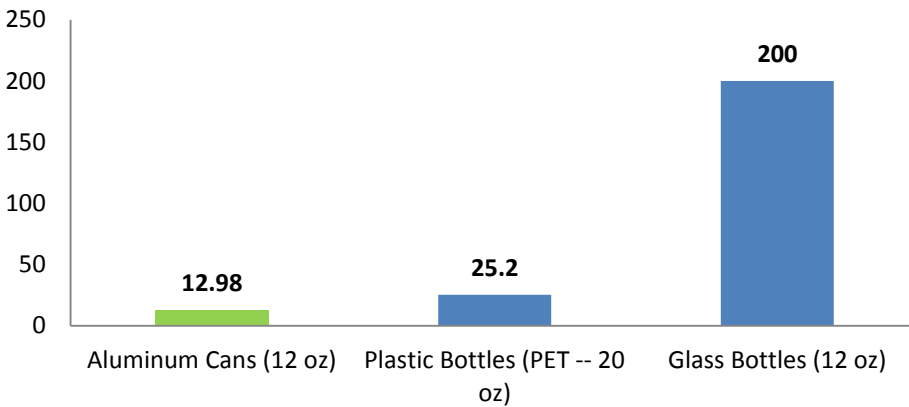
The weight reduction allows beverage makers to ship cans more efficiently. In fact, the reduction in can weight translates into both transportation energy and cost savings for beverage brands that package their products in cans.

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](#).

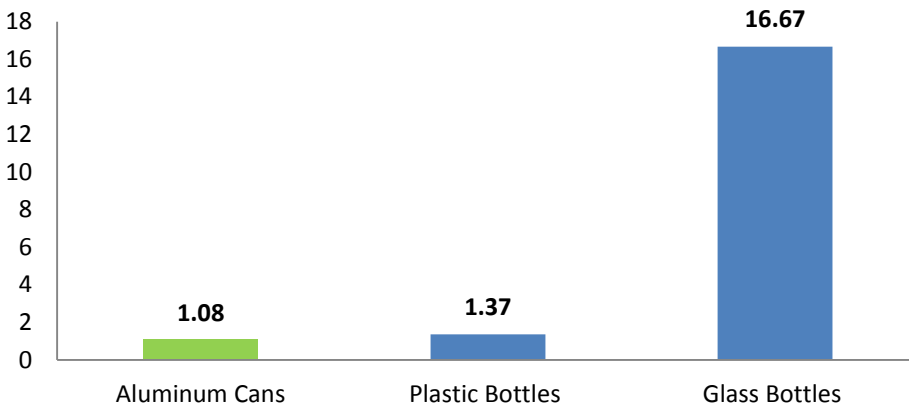


Weight of Standard Beverage Packaging Containers (grams)



The weight of the average aluminum can compares favorably to both glass and plastic beverage containers. This information is based on a combination of data from the Can Manufacturers Institute as well as the EPA Individual Waste Reduction (iWARM) model and Owens-Illinois.

Weight Per Ounce of Beverage Packaged (grams)



Even when the data is normalized to account for the size of different packaging types, the aluminum can still comes out on top. You can package more beverage using less material (by weight) with aluminum than with competing packaging types.