The Aluminum Association

BEVERAGE CAN

LCA REPORT

Technical Digital Toolkit
2021

1,000 ALUMINUM CANS

- The report assumes 1,000 aluminum beverage cans with different sizes representing the existing marketplace.
- The total metallic weight of the cans is 12.99 kg and a weighted average size is 13.6 fluid ounce per can.
- The recycled material content is 73% per can including 50% from post-consumer sources and 23% from pre-consumer sources.
- The end-of-life (EOL) recycling rate is 50.4%

1,000 CANS

Total metallic weight: 12.99 kg

Weighted average size: 13.6 fluid ounce per can

Recycled material content: 73% per can

End-of-life recycling rate: 50.4%

UNDERSTANDING THE JARGON

- The study considers both the cradle-to-gate (raw material extraction to finished cans) and cradle-to-grave (raw material extraction to end-of-life disposal or recycling) carbon footprint of aluminum cans.
- Cradle-to-gate analysis is most sensitive to the recycled content and/or primary aluminum used in can production while cradle-to-grave analysis is most sensitive to end-of-life recycling rates.
- The cradle-to-gate carbon footprint of a single aluminum can is 77.1 g CO_2 equivalent.
- The cradle-to-grave carbon footprint of an average aluminum can is 96.8 g CO_2 equivalent.

Cradle-to-gate carbon footprint of an aluminum can: 77.1 g CO_2 eq

Cradle-to-grave carbon footprint of an aluminum can: 96.8 g CO_2 eq

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RECYCLING 1 ALUMINUM CAN

- The benefits of recycling one average aluminum can, when represented by energy and GHG emissions:
  - 1.56 megajoules (MJ) of energy is saved
  - 98.7 g of CO2eq emissions are avoided
- This is based on the assumption that if the metal is not saved through recycling, the equivalent amount of primary metal must be produced to meet the demand.

Benefits of recycling 1 average aluminum can:

1.56 megajoules (MJ) of energy saved

98.7 g of CO_2eq emissions are avoided

CRADLE-TO-GATE ENVIRONMENTAL FOOTPRINT

CRADLE-TO-GATE ENVIRONMENTAL FOOTPRINT OF CANS

Indicator	Unit	1,000 Cans	1 Can	1 ounce of beverage	1 liter of beverage	1 gallon of beverage
Global warming	kg CO2 eq.	77.1	0.0771	0.00567	0.192	0.726
Primary energy, total	MJ	1320	1.32	0.0971	3.28	12.4
Primary energy, fossil	MJ NCV	1030	1.03	0.0757	2.56	9.69
Primary energy, renewable	MJ	293	0.293	0.0215	0.727	2.75
Acidification	kg SO2 eq.	0.226	0.00026	0.0000166	0.000561	0.00212
Eutrophication	kg N eq.	0.00784	0.00000784	0.000000576	0.0000195	0.0000737
Smog formation	kg 03 eq.	2.63	0.00263	0.000193	0.00653	0.0247
Particulate matter	kg PM2.5 eq.	0.0233	0.0000233	0.00000171	0.0000578	0.000219
Water consumption (excl. turbined water)	kg	183	0.183	0.0135	0.456	1.73

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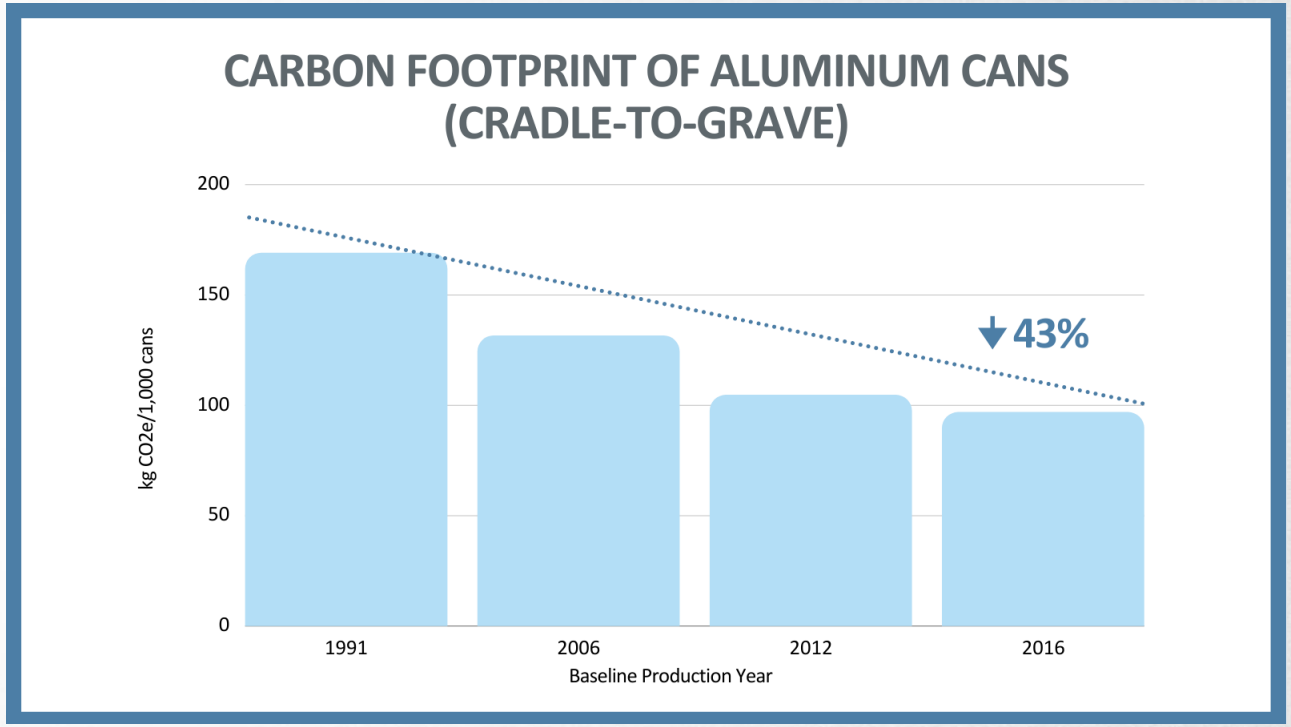
CRADLE-TO-GRAVE ENVIRONMENTAL FOOTPRINT

CRADLE-TO-GRAVE ENVIRONMENTAL FOOTPRINT OF CANS

Indicator	Unit	1,000 Cans	1 Can	1 ounce of beverage	1 liter of beverage	1 gallon of beverage
Global warming	kg CO2 eq.	96.8	0.0968	0.00712	0.241	0.911
Primary energy, total	MJ	1630	1.63	0.12	4.06	15.4
Primary energy, fossil	MJ NCV	1210	1.21	0.089	3.01	11.4
Primary energy, renewable	MJ	421	0.421	0.031	1.05	3.97
Acidification	kg SO2 eq.	0.319	0.00319	0.0000235	0.000795	0.00301
Eutrophication	kg N eq.	0.00995	0.00000995	0.000000732	0.0000248	0.0000937
Smog formation	kg 03 eq.	3.41	0.00341	0.000251	0.00849	0.0321
Particulate matter	kg PM2.5 eq.	0.0338	0.0000338	0.00000249	0.0000842	0.000319
Water consumption (excl. turbined water)	kg	200	0.2	0.0147	0.497	1.88

CARBON FOOTPRINT

- The carbon footprint of a North American made aluminum beverage can has declined dramatically during the past three decades.
- This is due to a reduction in carbon intensity for primary aluminum, lighter cans and more efficient manufacturing operations.



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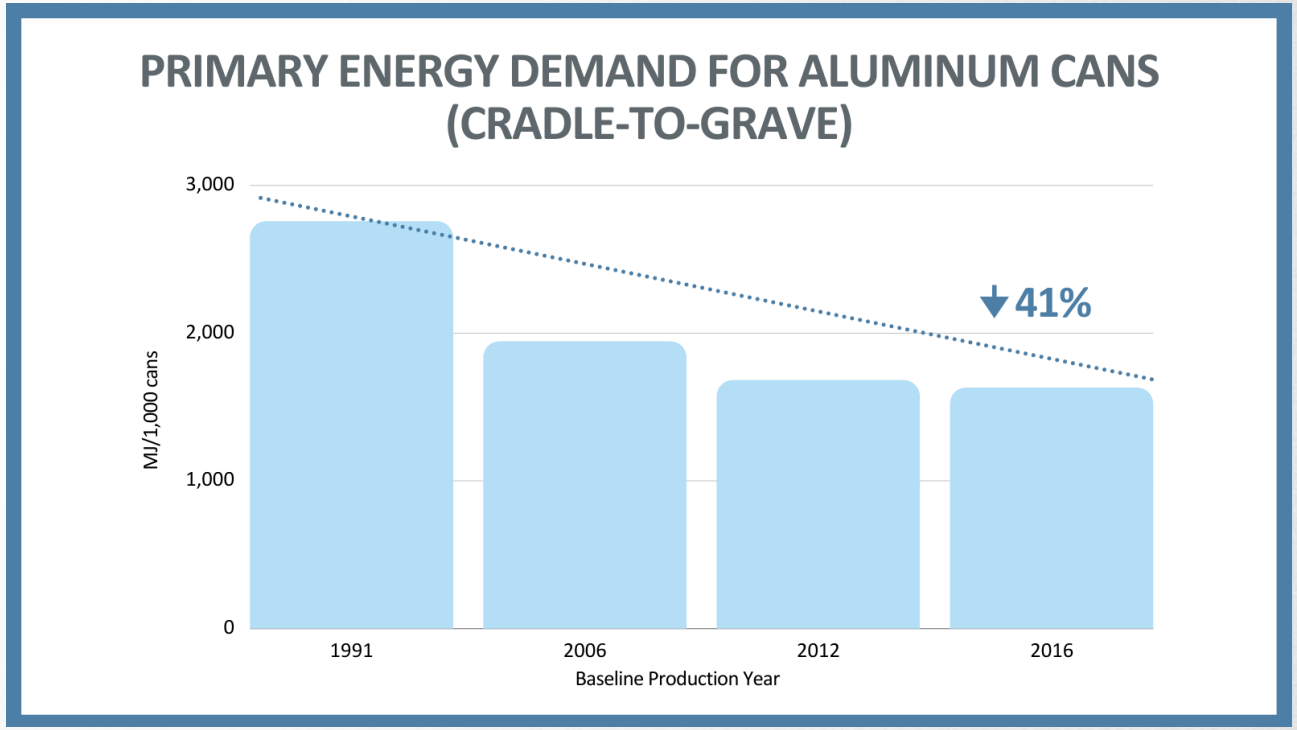
ENERGY DEMAND

- The energy demand to produce a North American aluminum beverage can has declined dramatically during the past three decades.
- This is due to a reduction in carbon intensity for primary aluminum, lighter cans and more efficient manufacturing operations.



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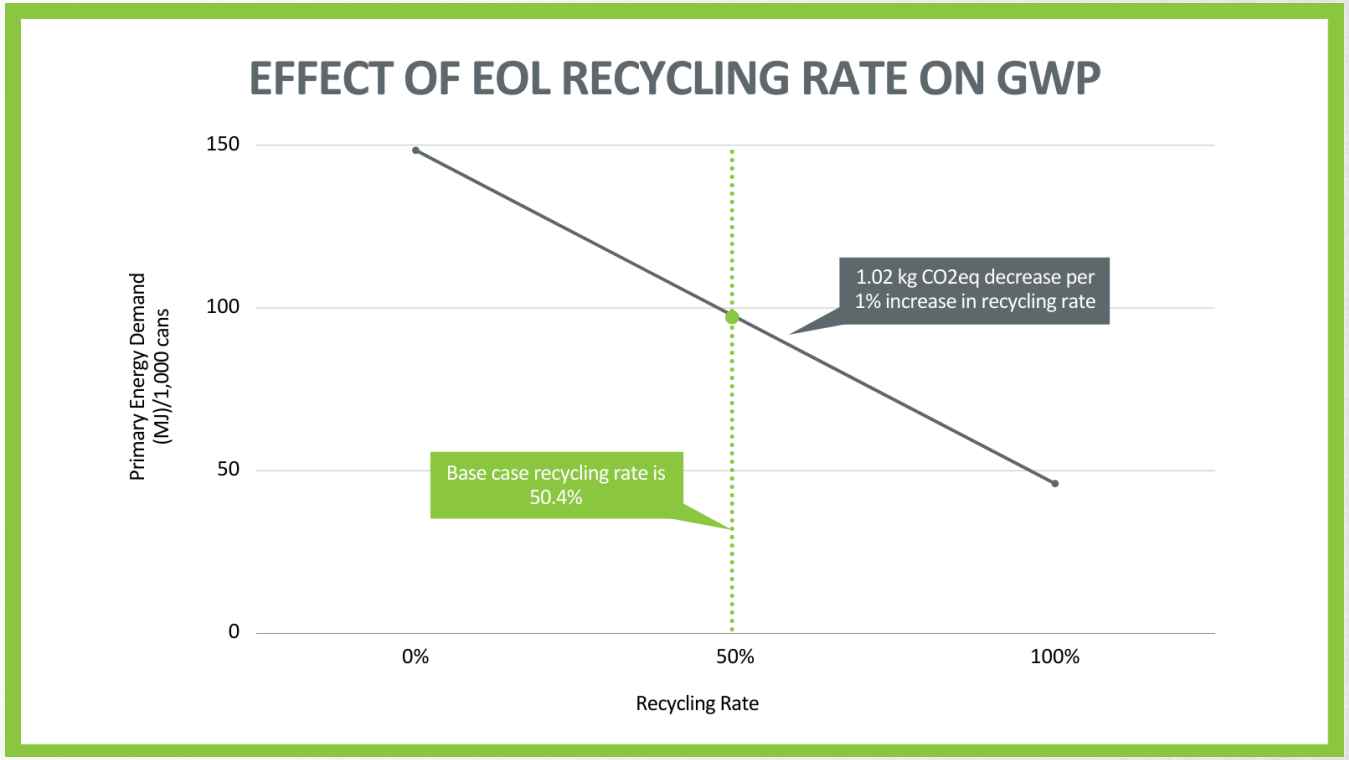
CAN RECYCLING

- Recycling matters! UBC recycling helps reduce the cradle-to-grave carbon footprint of aluminum cans.
- Each percentage increase in the end of life recycling rate will reduce the can's cradle-to-grave carbon footprint by 1.02 kg CO_2 equivalent per 1,000 cans.



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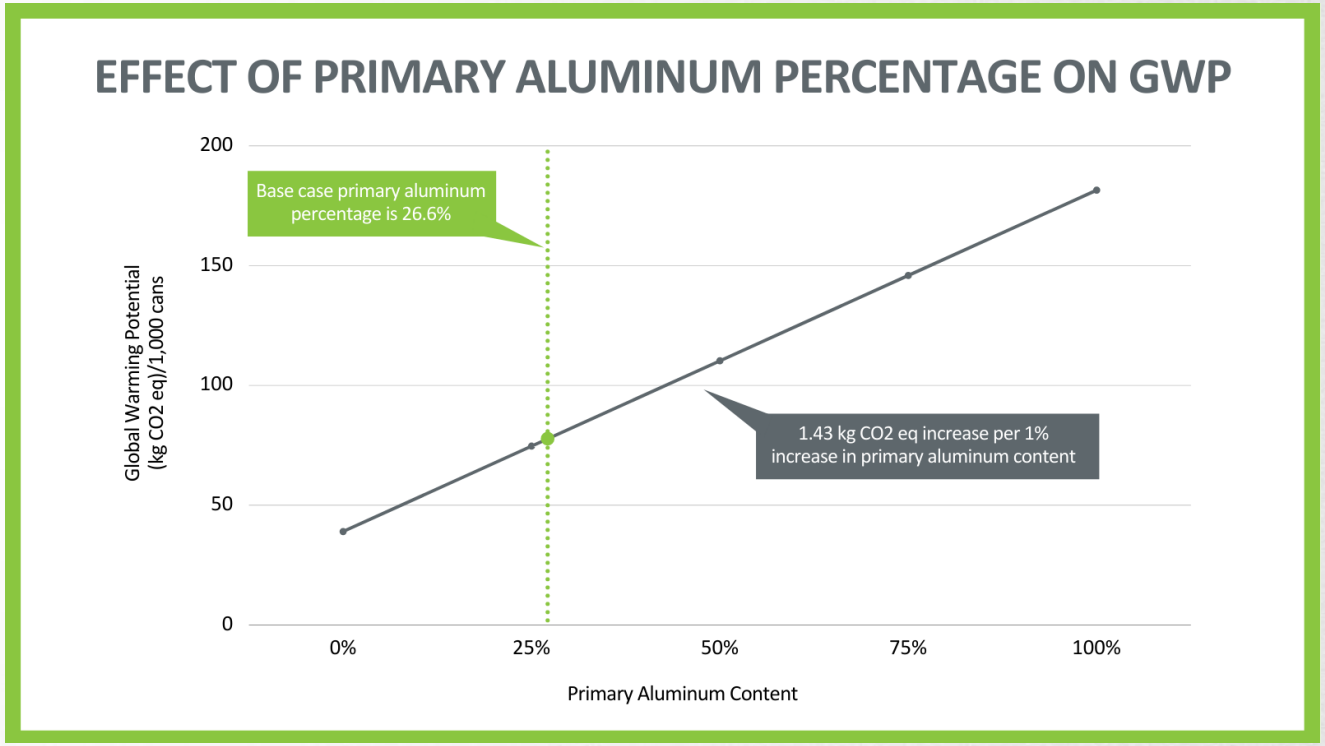
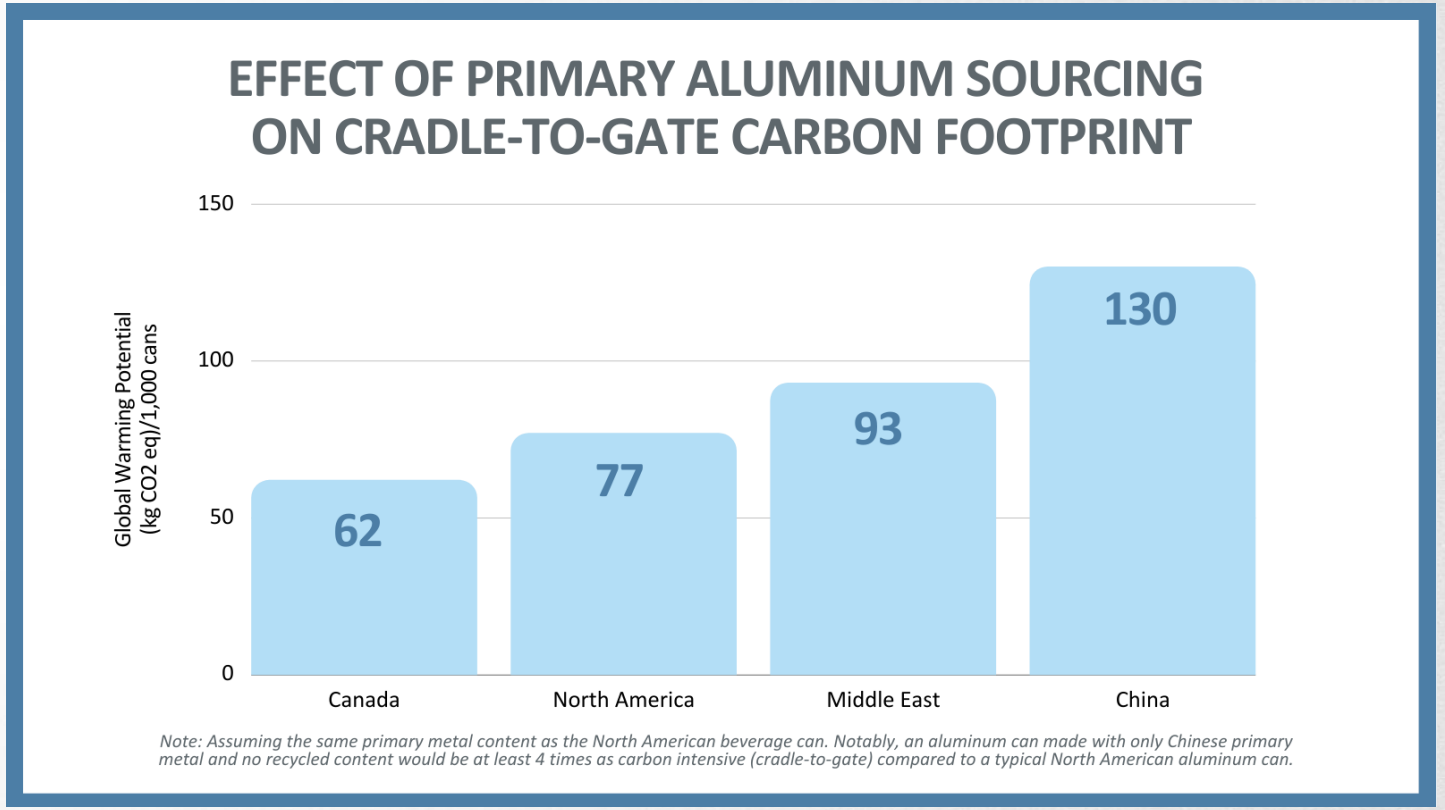
RECYCLED CONTENT

- Recycled content matters! Recycled material helps reduce the cradle-to-gate carbon footprint of aluminum cans.
- Each percentage increase in recycled content will reduce the can's cradle-to-gate carbon footprint by 1.43 kg CO_2 equivalent per 1,000 cans.



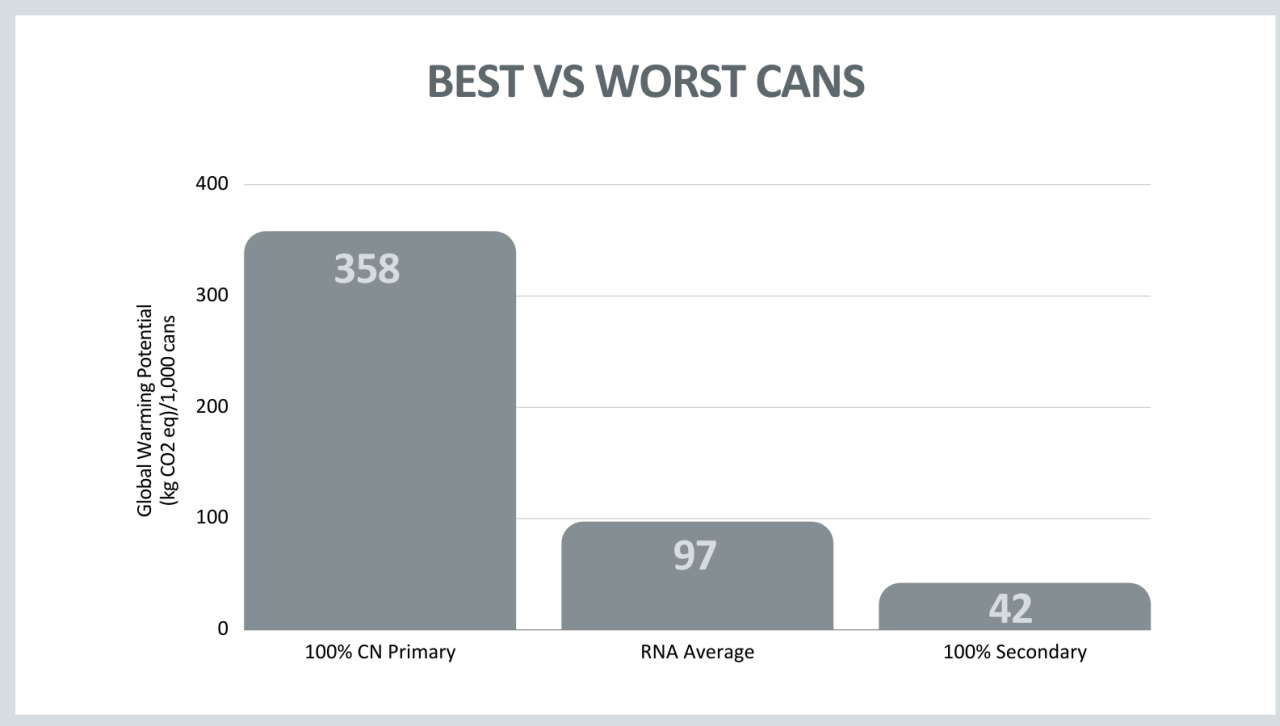
PRIMARY ALUMINUM

- Sourcing of primary aluminum matters! Although the average U.S.-made can contains only 26.6 percent primary aluminum, it is the largest component of the can's carbon footprint.
- Sourcing this small amount of metal from different regions and countries can change the cradle-to-gate carbon footprint of the can dramatically.



BEST VS WORST CAN

- The lowest achievable carbon footprint for an aluminum beverage can is one made with 100 percent recycled metal and 100 percent end-of-life recycling.
- The worst possible carbon footprint for an aluminum beverage can is one made with 100 percent Chinese-made primary aluminum and with no recycling at the end of life.
- Note: These hypothetical cans are assumed as the most extreme scenarios.



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