

ALUMINIUM RECYCLING REDUCES GREENHOUSE GAS EMISSIONS BY OVER 90%

As well as aluminium recycling saving 95% of the energy needed for primary aluminium production, the recycling process saves a similar percentage in greenhouse gas emissions.

In 2022, the carbon footprint of global primary aluminium production (from mine to cast house) was

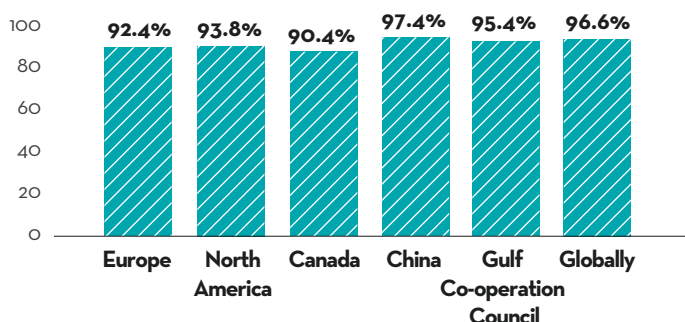
15.1 tonnes of CO₂e per tonne

In contrast, the carbon emissions for producing recycled aluminium (gate-to-gate) were

0.52 tonnes of CO₂e per tonne

The comparison covers cradle-to-gate emissions for primary aluminium and gate-to-gate emissions for recycled aluminium, i.e. the emissions from processing aluminium scrap, not any emissions embodied in the scrap.

ESTIMATED EMISSIONS SAVINGS



These emissions savings are based on latest published cradle-to-gate emissions for primary aluminium versus gate-to-gate emissions for recycling.

The emissions for recycling should not be considered as the carbon footprint of recycled aluminium, which can differ largely depending on the LCA method.

DATA AND MODELLING

IAI publishes the carbon footprint for primary aluminium annually, generating updates with the support of LCA Gabi-Software.

This number is higher than the two numbers by European Aluminium (6.7 tonnes CO₂e/tonne for primary aluminium production in Europe and 8.6 tonnes CO₂e/tonne for primary aluminium used in 2015) and the US Aluminum Association (8.45 tonnes CO₂e/tonne for primary aluminium production in North America and 8.51 tonnes CO₂e/tonne for primary aluminium in 2015).

There is currently no global carbon emissions number for recycled aluminium. The three datasets available are:

- Japan (0.3 tonnes CO₂e/tonne, 2015)
- Europe (0.51 tonnes CO₂e/tonne, 2015 and 0.44 tonnes CO₂e/tonne, 2018)
- North America (0.53 tonnes CO₂e/tonne, 2015).

Japan is purely for wrought alloys and was therefore excluded from the used average.

Data sources, links and publications:

- Reference Document on Carbon Footprint Calculations of Aluminium Scrap, January 2023
- Greenhouse Gas Emissions Intensity - Primary Aluminium
- Environmental Profile Report, Life-Cycle inventory data for aluminium production and transformation processes in Europe, February 2018
- Environmental Profile Report, Life-Cycle Inventory data (2017-2019) for the production of cast alloys ingot from scrap and waste, November 2021
- The Environmental Footprint of Semis-Fabricated Aluminium Products in North America, A Life Cycle Assessment Report, January 2022
- Inventory analysis report of scrap melting for wrought material, March 2023

Visit international-aluminium.org for more information.