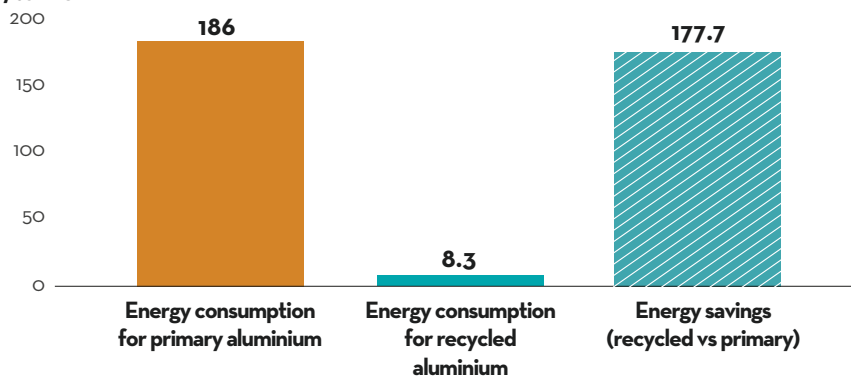


ALUMINIUM RECYCLING SAVES 95% OF THE ENERGY NEEDED FOR PRIMARY ALUMINIUM PRODUCTION

In 2019, the primary energy consumption for global primary aluminium production, from mine to cast house, was 186 gigajoules per tonne. In contrast, the primary energy demand for recycled aluminium was 8.3 gigajoules per tonne, resulting in a significant energy saving (95.5%).

ENERGY CONSUMPTION AND SAVINGS

GJ/tonne



- **Production of primary aluminium** through the Hall Heroult electrolysis process is energy-intensive, particularly electricity-intensive.

Aluminium scrap has a low melting

- **temperature** compared to other metals. Pure aluminium has a melting point of 660 degrees Celsius.

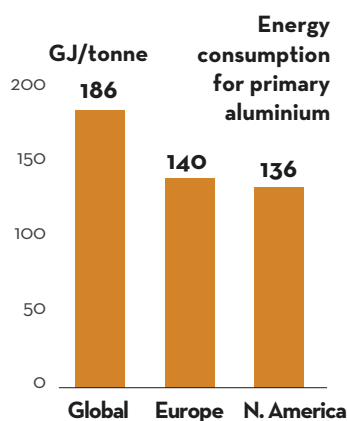
It is worth noting that the melting point of aluminium scrap can vary

- depending on alloy composition and impurities.

DATA AND MODELLING

Based on Gabi-Software (version 2022.2) and IAI LCI data, primary energy consumption for global primary aluminium production, from mine to cast house, was 186 gigajoules per tonne of primary aluminium.

This number is higher than the two published numbers by European Aluminium (140 GJ/tonne for primary aluminium production in Europe, 2015) and the US Aluminum Association (136 GJ/tonne for primary aluminium production in North America, 2015) due to the higher share of coal in the energy mix globally.



To estimate the global recycling energy consumption, the dataset for Europe and North America was used.

Three datasets are available: Japan (5.7 GJ/tonne, 2015), Europe (8.5 GJ/tonne, 2015 and 7.2 GJ/tonne, 2018), and North America (9.2 GJ/tonne, 2015). Japan is purely for wrought alloys and was therefore excluded from the used average.

Data sources, links and publications:

- 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 Aluminum Products in North America, A Life Cycle Assessment Report, January 2022
- Inventory analysis report of scrap melting for wrought material, March 2023.