

## IAI Beyond 2 Degrees Aluminium Sector Data Sheet (2018-2050)

This document outlines the scope, methodologies, data and analytical tools used by the *International Aluminium Institute* (IAI) to calculate the current GHG emissions footprint and model a 2050 scenario for the aluminium industry, based on the *International Energy Agency's* (IEA) Beyond 2 Degrees Scenario (B2DS).

### Scope, emission sources and processes included in IAI dataset

- Full life cycle (cradle-to-gate) greenhouse gas (GHG) emissions for semi-fabricated aluminium products
- All processes from mine (primary route) and end of life product collection (recycling route) to fabrication, including ancillary materials, transport, electricity production and background processes
- Global sectoral coverage (100%)
- Annual data, 2018 to 2050

### 2018 aluminium production and consequent process emissions

Total sector greenhouse gas emissions currently amount to 1.1 billion tonnes (Gt) of CO<sub>2</sub>e.

<b>2018</b>	<b>Annual metal production (million tonnes Al)</b>	<b>Global average process emissions intensity (t CO<sub>2</sub>e/t Al)</b>	<b>GHG emissions by process (Mt CO<sub>2</sub>e)</b>
<b>Primary Aluminium Production</b>	64	16.6	1,069
<b>Post-Consumer Scrap<sup>1</sup> Recycling</b>	19	0.6	12
<b>Pre-Consumer Scrap (from Part-Manufacturer)<sup>2</sup> Remelting</b>	13	0.5	6
<b>Pre-Consumer Scrap (from Fabricator)<sup>3</sup> Remelting</b>	33	0.3	11
<b>Semis Production</b>	95	0.3	29
<b>TOTAL:</b>			<b>1,127</b>

<sup>1</sup> Also known as old scrap

<sup>2</sup> Also known as new scrap or manufacturing scrap

<sup>3</sup> Also known as fabricator scrap, internal or run-around scrap

Historic primary aluminium production data can be found on the [IAI website](#), with recycling data available from [Alucycle](#). Historic emissions data for all emissions sources and processes can be found on the [IAI website](#); primary aluminium emissions intensity data is based on the IAI's [life cycle inventory](#) (2015) and annual [energy statistics](#). Recycling and downstream process emissions are based on [European Aluminium](#) (2015) and [The Aluminum Association](#) (2010) data applied to the global recycling industry.

## 2050 aluminium production and Beyond 2 Degree Scenario (B2DS) emissions

Production data forecasts are based on the [2020 IAI Reference Scenario](#) (March 2020). This dataset is updated annually.

The IEA has so far published two below 2°C warming scenarios: the [Beyond 2°C Scenario \(B2DS\)](#) in 2017 and the [Sustainable Development Scenario \(SDS\)](#) in 2020.

For the IAI's 2050 horizon, B2DS forecasts an 85% reduction in total anthropogenic<sup>4</sup> carbon dioxide from 34.3 Gt CO<sub>2</sub> in 2014 to 4.8 Gt CO<sub>2</sub>, while the SDS involves a 75% reduction on a 2019 baseline, from 35.7 Gt to 9.4 Gt CO<sub>2</sub>.

The IEA's 2050 B2DS-aligned sectoral budget for the aluminium industry (250 Mt CO<sub>2e</sub>) was calculated by adding the direct aluminium CO<sub>2</sub> emissions published by the IEA under B2DS (171 Mt CO<sub>2e</sub>), assessment of emissions from smelting electricity<sup>5</sup> consumption (8 Mt CO<sub>2e</sub>) and IAI estimated emissions for mining, non-CO<sub>2</sub> GHGs, electricity in non-smelting processes, transport and ancillary materials (69 Mt CO<sub>2e</sub>).

<b>2050</b>	<b>Mt Al</b>	<b>t CO<sub>2e</sub>/t Al</b>	<b>Mt CO<sub>2e</sub></b>
<b>Primary Aluminium Production</b>	74 – 88	2.5	200
<b>Post-Consumer Scrap Recycling</b>	59 – 73	0.3	50
<b>Pre-Consumer Scrap (Part-Manufacturer) Remelting</b>	2 <sup>6</sup> – 24	0.25	
<b>Pre-Consumer Scrap (Fabricator) Remelting</b>	8 <sup>6</sup> – 61	0.15	
<b>Semis Production</b>	150 <sup>6</sup> – 172	0.15	
<b>TOTAL:</b>			<b>250</b>

### IAI Secretariat Contact

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<sup>4</sup> Global anthropogenic emissions, covering all sectors

<sup>5</sup> Calculated by connecting aluminium smelters to the corresponding IEA regional B2DS electricity grid

<sup>6</sup> Near-complete elimination of pre-consumer scrap generation