ALUMINIUM SECTOR GREENHOUSE GAS PATHWAYS TO 2050

PARAMETERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>IAI baseline</td>
</tr>
<tr>
<td>BAU</td>
<td>IAI 2050 Business As Usual scenario</td>
</tr>
<tr>
<td>B2DS</td>
<td>2050 carbon budget aligned with International Energy Agency Beyond 2 Degrees Scenario</td>
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</tbody>
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Primary aluminium carbon footprint (t CO₂e/t Al)

Aluminium semis supply (million tonnes per annum)

- **Old scrap**: also known as post-consumer scrap. Recycling production from products after use (end-of-life products)
- **New scrap**: recycling production from scrap generated at part-manufacturers
- **Primary**:
**GHG emissions (million tonnes CO\textsubscript{2}e per annum)**

<table>
<thead>
<tr>
<th>Year</th>
<th>BAU</th>
<th>B2DS</th>
<th>Reduction</th>
</tr>
</thead>
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<tr>
<td>2018 primary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAU</td>
<td>0.9 Gt CO\textsubscript{2}e</td>
<td>0.65 Gt CO\textsubscript{2}e</td>
<td>-25% (0.25 Gt)</td>
</tr>
<tr>
<td>B2DS</td>
<td>0 Gt CO\textsubscript{2}e</td>
<td>0.25 Gt CO\textsubscript{2}e</td>
<td>-75% (0.75 Gt)</td>
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**Key**
- BAU = Baseline (as of 2018)
- B2DS = Best 2 Degrees Scenario
- CO\textsubscript{2}e = Carbon dioxide equivalent

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**GREENHOUSE GAS EMISSIONS REDUCTION PATHWAYS**

**Pathway 1**
**Electricity decarbonisation potential**
- BAU = 0.9 Gt CO\textsubscript{2}e
- B2DS = 0 Gt CO\textsubscript{2}e
- -60%* (-0.9 Gt)†
- -50% (-0.8 Gt)
- -10% (-0.15 Gt)

**Pathway 2**
**Direct emissions potential**
- BAU = 0.65 Gt CO\textsubscript{2}e
- B2DS = 0.25 Gt CO\textsubscript{2}e
- -35% (-0.3 Gt)
- -15% (-0.2 Gt)
- -15% (-0.2 Gt)

**Pathway 3**
**Recycling & resource efficiency potential**
- BAU = 0.9 Gt CO\textsubscript{2}e avoided
- B2DS = 1.1 Gt CO\textsubscript{2}e avoided
- Near 100% end of life collection and alloy sorting
- Elimination of all metal losses during casting and recycling

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**2050 demand**
Total sector emissions need to be reduced by 80%, while demand for aluminium products grows by over 70%

**Electricity**
Decarbonisation of electricity offers the largest potential for aluminium sector GHG emissions reduction

**Recycling**
Improving post-consumer scrap recycling requires action from players all along the aluminium value chain

**Process emissions**
Novel technologies for heat and steam, and zero carbon smelting are required

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* Potential reduction on BAU (1.6 Gt CO\textsubscript{2}e) emissions  † Absolute CO
** Includes 0.15 Gt CO\textsubscript{2}e from indirect emission sources (predominantly input materials & transport)