Establishing a global standard for low-carbon emissions steelmaking

A dual score standard for rating the decarbonisation progress of steel producers and the embodied carbon emissions in steel products

Concept proposal for consultation
June 2022
There is a clear need for a standard which allows policymakers to incentivise the steel industry to decarbonise and provides customers with a comparable measurement of embodied carbon emissions in steel products.

Today, there is no industry definition or standard for low-carbon emissions steelmaking, yet:

- Customer supply chain CO$_2$e targets are growing
- Initiatives to define embodied carbon emissions in steel are multiplying
- The risk of inconsistent standards is escalating

Therefore, establishing such a standard has an important role to play in the decarbonisation of the steel industry. The demand signals for a standard are clear. We need a low-carbon emissions standard for steel which:

- Provides transparency and consistency across products for customers through Life Cycle Assessment (LCA) values, or Environmental Product Declaration (EPD) values in construction products
- Incentivises decarbonisation by allowing policy makers to create differentiated lead markets for low-carbon emissions steel production that will provide steelmakers with a premium to fund capital investments
ArcelorMittal’s low-carbon emissions steel concept is based on three core principles

1. It must have a dual-score approach (LCA + decarbonisation rating system) that supports policymakers in the development of differentiated lead markets for low-carbon emissions steel production, and provides customers with comparable, transparent data of embodied carbon emissions in steel products.

2. It must be designed in such a way that incentivises the decarbonisation of all methods of steel production through technology shifts, rather than simply through increasing scrap rates using existing technology. This can be done by using a sliding scale based on the percentage of scrap used in production.

3. The decarbonisation rating system must be measured against a clearly defined embodied carbon emissions boundary which ensures a like-for-like comparison of the critical elements needed for core steel production.
1. A dual-score approach that incentivises decarbonisation progress and provides a comparable and transparent values for embodied carbon emissions of steel products

- Provides clear LCA or EPD values for the total embodied carbon of the product against a defined methodology
- A visible and transparent system that measures decarbonisation progress independent of steel making route
- Easy to use by authorities to define and incentivise dynamically low CO2e steel lead markets over time as decarbonisation of steel production processes progresses
- Based on 1 tonne of Hot Rolled Product
- Associated with physical steel production
- Technology independent

Embodied carbon emissions:  Method: ISO 14040/44 etc

<table>
<thead>
<tr>
<th>Supplier Identifier</th>
<th>Product Identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Steel Decarbonisation Progress</td>
<td></td>
</tr>
<tr>
<td>A* net zero</td>
<td></td>
</tr>
<tr>
<td>A near zero</td>
<td></td>
</tr>
<tr>
<td>B major</td>
<td></td>
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<tr>
<td>C moderate</td>
<td></td>
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<tr>
<td>D minor</td>
<td></td>
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<tr>
<td>E entry level</td>
<td></td>
</tr>
<tr>
<td>F above minimum threshold</td>
<td></td>
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</tbody>
</table>

For policymakers and steel producers

For customers
Virtual ‘S’ certificates designed to be able to pass CO₂e savings on to customers to help them reduce their Scope 3 emissions

Achieved by making CO₂e reduction investments in primary operations

Must not result in double-counting of material CO₂e reductions by the operation

Quantity of steel and CO₂e savings to be verified by external auditors in accordance with GHG Protocol

For policymakers, primary producers and customers
2. It must incentivise the decarbonisation of all methods of steel production

- If the steel industry is to successfully contribute to the objectives of the Paris agreement then **all steel producers must progress towards net zero**, irrespective of their starting points.

- The embodied carbon emissions in a tonne of steel is heavily influenced by the metallic input used in steelmaking, with secondary steelmaking (scrap-based) carrying a much lower carbon footprint than primary steelmaking (iron ore-based).

- However, there is not enough secondary steel to meet the global steel demand outlook; scrap is a finite resource. Primary based steel will continue to be needed for the global economy beyond 2050, particularly for the low carbon infrastructure that is needed to decarbonise.

- Therefore, any low-carbon emissions steel standard needs to:
  - Account for the metallic input used in steelmaking by using a sliding scale based on the percentage of scrap steel used in production.
  - Encourage the decarbonisation of all steelmaking methods through the introduction of low-carbon emissions technology, rather than incentivising decarbonisation by simply increasing the level of scrap used in steelmaking.
A banded scoring system that largely neutralises the effect of scrap as the main decarbonisation method will incentivise technology shifts

- A steel producer’s position on the graph would be based on their embodied carbon emissions per tonne of hot rolled steel (y-axis) and the metallic input they use (x-axis).
- Steel producers on or below the threshold would fall into six bands – A+ to E - with the producer progressing through the bands as they decarbonise (% embodied CO$_2$e emissions below the threshold).
- Like the ResponsibleSteel™ and IEA proposals, the threshold for near-zero steel should be set at a level which supports all potential decarbonisation routes.
- We believe a scoring system that rewards steel producers for achieving higher ratings by structurally lowering emissions through technology investments, will be a key supporting instrument to drive down steel emissions and meet the 1.5°C target.
For the decarbonisation progress score, we propose focussing on all steel industry activities that fall within the core steel system boundary initially to enable a like-for-like comparison between steelmakers for the embodied carbon emissions in a tonne of hot rolled steel, using internationally recognised methodologies. This will be extended upstream in subsequent phases.

### Hot Rolled Product System Boundary Phasing
- The underlying principle is to ensure no integrated steelmaker is advantaged or otherwise due to their structure
- All steel products are directly comparable up to this boundary
- All direct emissions and electricity-related emissions sources of the industry are included in the hot rolled steel system boundary, regardless of ownership
- These are usually Scope 1 and 2 but may include some Scope 3 where process is owned by third parties
- NZSPMP crude steel system boundary and rolling mills is proposed during 1st phase
- Value chain emissions, excluding non-ferrous ores (mining, processing & transportation), will be added to the decarbonisation effort rating in the second stage
- Primary upstream data will be used in the 3rd stage

### Boundary for LCA / EPD value

<table>
<thead>
<tr>
<th>Upstream Value Chain</th>
<th>Core Steel System Boundary</th>
<th>Downstream Value Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Material Extraction</td>
<td>Steel input production</td>
<td>Downstream Transport and Distribution</td>
</tr>
<tr>
<td>Iron Ore Mining</td>
<td>Raw Material Preparation</td>
<td>Semi-finished Products</td>
</tr>
<tr>
<td>Iron and steel scrap collection and sorting</td>
<td>Pelletisation</td>
<td>Investments</td>
</tr>
<tr>
<td>Upstream transport</td>
<td>Sintering</td>
<td>Manufacturing of Fabricated Steel Products</td>
</tr>
<tr>
<td>Coal mining</td>
<td>Coke making</td>
<td>Activities not included in SBT</td>
</tr>
<tr>
<td>Limestone Mining</td>
<td>Coke making</td>
<td>Activities included in steel system core SBT</td>
</tr>
<tr>
<td>Natural gas extraction</td>
<td>Coke making</td>
<td>Activities included in steel system core SBT if owned by company</td>
</tr>
<tr>
<td>Non-ferrous Ore Mining</td>
<td>Coke making</td>
<td>Activities outside steel system may be included in value chain SBT</td>
</tr>
</tbody>
</table>

### Boundary for decarbonisation rating system

| Emissions associated with the extraction, processing and transport of non-ferrous ores are excluded from the decarbonisation effort rating because they are highly variable and dependent on the product being made. These are captured in the LCA/EPD value of the finished product. |

### Diagram

- **Crude Steel System Boundary**: Includes all direct emissions and electricity-related emissions sources of the industry.
- **Upstream Value Chain**: Includes activities from raw material extraction to crude steel production.
- **Core Steel System Boundary**: Includes all direct emissions and electricity-related emissions sources of the industry, regardless of ownership.
- **Downstream Value Chain**: Includes all activities from crude steel production to finished product.
**Supported by a detailed set of requirements for rating embodied carbon in steel, and validated by independent experts**

### Principles-based

- Dual score approach that provides differentiated decarbonisation progress bands to incentivise CO$_2$e reductions in physical steel provides comparable and transparent embodied carbon emissions through LCA or EPD values
- Includes label for equivalent CO$_2$e reductions achieved by significant efforts in primary operations ('S' or 'balanced')
- Incentivises primary and secondary steelmakers to decarbonise by making capital investments in technology shifts rather than relying on a finite amount of scrap metal
- Thresholds and qualifying company data use a clearly defined steel production boundary
- Supported by clear, unambiguous GHG accounting rules for steelmaking and independent assurance
- Thresholds incentivise decarbonisation pathways with potential for achieving near zero
- No offsetting allowed until band A (near zero) is reached
- Use regionally or internationally recognised LCA/EPD standards for full product footprint

### Stakeholder alignment

- Provides customers with comparability and transparency
- Aligns with industry best practice
- Drives towards meeting civil society’s expectations
- Avoids disclosure of commercially sensitive data
- Phased approach allows for use of more mature, consistent and comparable scope 3 methodology

**Provides customers with product transparency and comparability | Incentivises use of low embodied CO$_2$ steels**
Summary

• A dual score approach that supports policy makers in the development of differentiated lead markets for low-carbon emissions steel production, and provides customers with comparable, transparent data of embodied carbon emissions in steel products
• Continues to recognise early actions taken by first mover primary producers
• Incentivises the decarbonisation of all methods of steel production
• Based on a clearly defined steelmaking boundary from which embodied carbon emissions are counted
• Critical tool to enable the steel industry to contribute to the objectives of the Paris agreement
Thank you