S&P Global
Mobility

AutoTechInsight Insights
Materials and Lightweighting
May 2025

Sustainable steel: Insights from Tata Steel UK's leadership

07-May-2025 16:46 GMT

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Q&A with Tata Steel UK

The automotive steel industry is experiencing notable changes driven by sustainability concerns. Key trends include the adoption of lower carbon production methods, increased recycling efforts and a focus on responsible sourcing practices.

One significant trend is the transition from traditional steelmaking processes to electric arc furnace (EAF) technology. EAFs primarily use recycled scrap steel, resulting in a reduction of carbon emissions compared to conventional blast furnaces, which rely heavily on coal and iron ore. According to the World Steel Association, EAFs can produce steel with up to 75% lower CO2 emissions than traditional methods. As automotive manufacturers set ambitious targets for carbon neutrality, the demand for low-emission steel products is expected to rise.

Another important issue is the sourcing of eco-friendly materials. The automotive sector is increasingly prioritizing responsible procurement, which emphasizes the need for traceability and sustainability in the supply chain. Steel manufacturers are engaging with automotive original equipment manufacturers to ensure that materials meet environmental standards. The use of recycled steel not only conserves resources but also reduces the environmental impact associated with steel production. The recycling rate of steel is already high, with approximately 85% of steel used in automotive applications being recycled at the end of its life.

Regulatory pressures are also influencing the industry's sustainability efforts. Governments worldwide are implementing stricter emissions regulations, pushing manufacturers to adopt greener practices. For instance, the European Union's Green Deal aims to make Europe climate-neutral by 2050, which includes significant reductions in emissions from the automotive sector.

To gain further insights into these trends and challenges, we spoke with Peter Hodgson, manager of sustainability policy & assessment at Tata Steel UK, and Nick Silk, head of product management and development & customer technical services at Tata Steel UK.

Nick Silk

Peter Hodgson

Key takeaways:

- Tata Steel UK utilizes an environmental product declaration (EPD) program and a sustainability assessment tool in its new product development process to transparently disclose the environmental impacts of its products and assess sustainability performance.
- The company has implemented a sustainability policy and responsible procurement policy to promote eco-friendly materials and engage suppliers in reducing Scope 3 emissions, while transitioning to EAF technology to utilize domestic scrap steel.
- Recent partnerships, including a £500 million grant from the UK government for EAF installation at Port Talbot, aim to enhance sustainability and increase the use of locally sourced scrap steel, reducing reliance on imported materials.
- Tata Steel UK targets a 30% reduction in CO2 emissions by 2030 and net-zero emissions by 2045, with a focus on innovation, collaboration within the supply chain, and the development of skills to maintain competitiveness while achieving sustainability goals.

The following is an edited transcript of the conversation.

S&P Global Mobility: How does Tata Steel UK assess the environmental impact of its products, and what metrics are used to measure sustainability performance in your recent initiatives?

Tata Steel UK operates an [EPD] program and has published over 100 third-party verified EPDs and environmental profiles, which disclose the environmental impacts of its products, including carbon footprint, in accordance with international standards. We have also issued a third-party verified statement on recycled content.

As part of our new product development (NPD) process, we apply a sustainability assessment tool at key stages to identify both positive sustainability aspects and areas of potential concern. The assessment considers a range of sustainability issues, such as resource efficiency, product longevity and water usage.

Both the EPD program and the NPD sustainability assessment tool have received recognition through recent World Steel Association Steelie awards.

What specific actions has Tata Steel UK taken in the past year to promote sustainability throughout its supply chain, particularly in sourcing eco-friendly materials?

Tata Steel UK has adopted a sustainability policy that outlines our commitment to sustainability and our contribution to sustainable development through our products, services and activities. Our responsible procurement policy, based on OECD guidelines, informs our approach to sustainability across the supply chain, incorporating principles of health and safety, environmental protection, human rights, fair business practices and local community development.

We engage with our suppliers to explore options for reducing Scope 3 emissions, which are associated with purchased materials. This includes inputs to the steelmaking process (e.g., ferro-alloys), coatings like zinc used on our products, renewable electricity and biodiesel derived from hydrogenated vegetable oil. Our work focuses on defining achievable Scope 3 reduction impacts and assessing the quality of carbon footprint data and certification for these products.

As we transition to steelmaking using [EAF] technology, scrap steel will become our primary input. With the UK generating over 10 million tonnes of scrap steel annually, we aim to utilize this domestic resource to support a low-carbon, circular supply chain.

What recent partnerships has Tata Steel UK formed to enhance sustainability, and how have these collaborations advanced your initiatives?

In September 2024, Tata Steel UK announced the signing of a £500 million grant funding agreement with the UK government, enabling the project to install an EAF at the Port Talbot steelworks in Wales. Along with our own investment of £750 million, this represents a significant investment in the UK steel industry. With planning permission now approved by local authorities, the project is progressing. EAF production is expected to gradually ramp up from 2028, and we are collaborating with automotive customers to define their transition roadmaps, ensuring a smooth transition of our order books in the coming years.

We have also signed a memorandum of understanding with customers such as JCB for the supply of low-emission steel, marking an important step in our sustainability efforts.

The EAF will facilitate greater use of UK-sourced scrap steel, reducing our reliance on imported raw materials. Currently, about 10% of our inputs are sourced domestically, and the EAF setup aims to increase this to approximately 75%. This change will contribute to a more stable, locally anchored, and lower-carbon supply chain for automotive components and body panels.

What long-term sustainability goals has Tata Steel UK set regarding fossil fuels and carbon emissions, and how do you plan to achieve these while maintaining competitiveness?

In line with the broader Tata Group commitment, Tata Steel UK aims to achieve a 30% reduction in CO2 emissions by 2030 and to reach net-zero emissions (Scope 1 and 2) by 2045. Replacing our blast furnaces with [EAF] technology by 2028 is expected to contribute to a 50% reduction in the CO2 footprint of our EAF steel products. Meeting these emissions targets will require strong partnerships within the supply chain and clear policy frameworks, particularly regarding steel scrap, energy policy, public procurement and product environmental standards. Additionally, innovation in process and product development, along with the development of skills and capabilities, will be important for achieving our sustainability goals while remaining competitive.

Can you detail the research and development challenges Tata Steel UK faced when

embarking on more sustainable practices, and how were these challenges addressed?

Electric arc furnace steelmaking is a well-established process used for manufacturing steel products, including those for aerospace and engineering applications, for many years. In the past 30 years, there has been increased focus on the production of strip steel products, such as coil products used in automotive and domestic appliance manufacturing.

Tata Steel UK is engaging with vehicle original equipment manufacturers to examine the benefits and challenges of using more sustainable scrap-based steel products. The main difference between conventional "primary" steelmaking, which primarily uses new pure iron, and EAF steelmaking is the inclusion of higher levels of scrap steel. Scrap steel comes from previous uses and typically has a chemistry suited for its initial application, but it may require adjustments for its new application. Additionally, scrap may not always be well-separated from other metals (e.g., copper, stainless steel) and non-metals (e.g., glass, plastic).

After pollutants (such as oil) are removed, an end-of-life vehicle is generally crushed and shredded, resulting in a mixture of steel, glass, plastics and non-ferrous metals. While modern separation techniques are employed to segregate these components, research efforts are focused on improving the separation of ferrous scrap from other materials, which also aids in the reuse of the other components. For example, glass manufacturers prefer to avoid steel contamination in windscreen glass. Enhanced scrap separation and sorting are important for maximizing the potential of end-of-life scrap in EAF steelmaking.

Tata Steel UK is also working with automotive OEMs to optimize the recycling of (pre-consumer) manufacturing scrap from their press shops. This source of well-defined scrap is available in relatively large quantities and can be used to manufacture new automotive steels. Discussions are also exploring options for low-carbon transportation of scrap from assembly plants back to Tata Steel to minimize environmental impact.

What testing and validation processes do your products undergo to ensure safety and performance, and how have these processes evolved in the past year, taking sustainability into consideration?

The introduction and approval of new steels in the automotive sector is a collaborative process involving both steelmakers and original equipment manufacturers and requires careful planning. New steel introductions are typically aligned with model starts of production, with product assessment and evaluation generally beginning at least 18 months before adoption.

Tata Steel UK has developed a new product approval process that has been piloted and implemented with OEMs over the past year. Our core product development teams create supporting evidence packs, and our customer technical field engineers assist with press-shop trials.

Through this process and customer engagement, we are exploring ways to streamline the introduction of more sustainable steels while ensuring that safety and performance criteria are met.

The new product introduction process continues beyond initial approval. Our technical support engineers and R&D teams can assist in optimizing press shop performance through adjustments to blank design and press setup. Our teams also provide value engineering support to explore cost optimization for body-in-white, reduce weight and improve overall performance.

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