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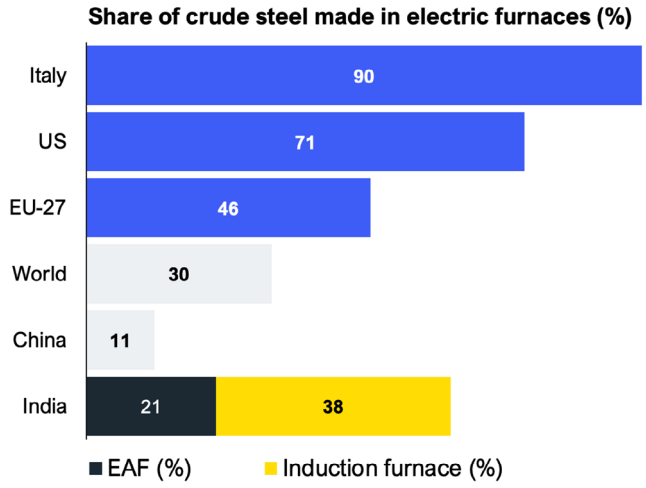
Fact sheet

Steel quality from recycled scrap: A fact check

Why steel quality depends on inputs and refining, not the furnace route

There is a perception in India that steel made from recycled scrap in electric arc furnaces (EAFs) is of inherently lower quality than steel produced through the blast furnace-basic oxygen furnace (BF-BOF) route. This perception matters: 66% of India's planned steel capacity pipeline is linked to the coal-intensive blast furnace route, potentially locking in coking-coal dependence and emissions. Yet, the Bureau of Indian Standards (BIS) does not prescribe a furnace type. The IS 1786 (reinforcement steel) and IS 2062 (structural steel) both leave the production process "at the discretion of the manufacturer."

India already makes most of its steel in electric furnaces, but nearly two-thirds of that comes from small induction furnaces with limited refining capabilities.





The US manufactures 71% of its steel in EAFs and Italy 90%, including automotive and speciality grades. In India, nearly 64% of electric steel comes from around 1,100 small induction furnaces. These furnaces rely mainly on coal-based sponge iron (59% of iron inputs) rather than scrap (37%) and are less effective at removing impurities. Most of them also lack secondary refining and pre-melt scrap processing. **India's quality concerns, thus, relate to inputs and refining, not to scrap itself.**

Source: Italy, US, EU-27, World, China: Worldsteel Association, World Steel in Figures 2026 (2025 data). India: Ministry of Steel Annual Report 2025-26 (FY2025).

Fact checks

Claim #1

Scrap-based EAF steel is inherently inferior and unsuitable for construction

Fact check:

Buildings and infrastructure account for 52% of global steel use and around 69% in India. Scrap-based EAF steel can meet the required standards for most long products and construction steel used in these sectors. These applications are generally less sensitive to scrap-related impurities. Quality should be assessed against the applicable BIS standards, such as IS 1786 for rebar, not the use of scrap alone.

Claim #2

High-grade automotive steel requires the BF-BOF route

Fact check:

The EAF route is also capable of producing high-performance automotive steel with demanding quality standards. In fact, Nucor, a major EAF-based steelmaker, produces automotive steels ranging from conventional high-strength low-alloy (HSLA) grades to Advanced High-Strength Steel (AHSS), including dual-phase steel used in automotives.

Claim #3

Scrap-based steelmaking cannot control chemistry precisely enough

Fact check:

Tramp elements such as copper and tin can be difficult to remove once they enter the melt, making scrap quality and sorting critical. However, careful scrap selection and blending with high-grade, low-residual ore-based metallics, such as direct reduced iron (DRI), hot briquetted iron (HBI), and pig iron, can dilute tramp elements and improve chemistry control. Midrex Technologies highlights DRI's consistently low residual content as a key advantage for producing higher-quality steel.

Growing evidence to support EAF steel quality

While obsolete scrap alone may not meet the requirements of some automotive and specialised grades, producers are closing this gap using pre-melt scrap processing and ore-based metallics. Even Nippon Steel, a long-time BF-BOF steelmaker, is now converting capacity to large EAFs designed to make high-grade steel. The examples below show global EAF producers already making, or are investing to make, automotive and high-grade steel at commercial scale.

The global experience: Scrap-EAF steel usage in demanding applications

Producer	Route	Application
Nucor (US)	Scrap-EAF (with some DRI)	AHSS and exposed body panels; supplier to GM, Honda, Nissan, and Volkswagen
Tokyo Steel (Japan)	100% scrap-EAF	Hot-rolled pickled sheet for vehicle production; used by Toyota since 2025
JFE Steel (Japan)	Large EAF (scrap+low-carbon reduced iron)	Two million tonnes per annum (MTPA) EAF at Kurashiki plant targeting electrical steel and high-tensile sheet; expected to start in 2028
Nippon Steel (Japan)	Large EAFs (scrap+ore-based metallics)	High-grade electrical steel sheet manufactured by Hirohata EAF since 2022; Nippon Steel to invest JPY868.7 billion to shift around 2.9MTPA to EAFs by 2029

India's EAF transition

Producer	Status
Tata Steel, Ludhiana	Tata Steel's first scrap-based EAF in India (0.75MTPA, inaugurated March 2026) runs on 100% scrap and approximately 50% renewable power, producing Tata Tiscon rebar at designed emissions intensity below 0.3 tonnes of carbon dioxide per tonne
JSW Steel, Rayalaseema	Construction began in July 2026 on a 2MTPA EAF project in Andhra Pradesh using scrap and high-grade DRI, targeting production in FY2028-29

Note: Both currently target construction and structural steel. Moving into flat and automotive grades will need better scrap and investment in downstream processing.

Policy implications: Four priorities for India



1. Review route-based procurement criteria

Some specifications restrict eligibility to "primary steel producers having integrated plant," going beyond what BIS standards require. These should be revised so compliant scrap-EAF steel is not excluded.



2. Enforce quality standards consistently across all routes

Apply testing, certification, and quality enforcement across all production routes. Quality failures are compliance issues to be addressed through process control and testing, not evidence of an inferior route.



3. Build a stronger scrap collection and processing ecosystem

Accelerate investment in scrap collection, dismantling, shredding, and grading, particularly for end-of-life vehicles and industrial scrap. Better-quality domestic scrap will support the expansion of scrap-based EAF steelmaking.



4. Create demand for lower-emission steel

Support market development for high-quality, lower-emission steel through green public procurement, product-level emission disclosure, and credible certification. This can create demand for EAF-based steel while keeping product quality and performance requirements unchanged.

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