

# Forging Ahead

Pathways to Green Steel for India



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## Executive Summary

India aims to become a global leader in green steel production and consumption through the adoption of clean energy and advanced technologies and by promoting a circular economy to achieve net-zero emissions by 2070.

To achieve this, the country's steel sector must move beyond ambition and into an era of accountability.

The sector is among the most structurally difficult to abate because a significant proportion of its emissions are embedded in the chemistry of ironmaking and coal-linked production routes. At the same time, rapid demand growth and capacity additions driven by India's burgeoning economy risk locking in high-emissions assets for decades to come.

As a result, the critical question is not whether companies have net-zero targets, it is now whether their choices of pathway, capital expenditure strategies, and operational "proof points" can deliver sustained reductions in emissions intensity while maintaining cost competitiveness,

and whether these are supported by credible near-term actions rather than just long-dated ambitions.

Policy and market initiatives are creating stiffer tests of corporate credibility. India's Green Steel Taxonomy introduces a measurable basis for classifying and differentiating products by emissions intensity, shifting the market away from generic "green" claims towards auditable performance. In parallel, the EU's Carbon Border Adjustment Mechanism (CBAM) raises the bar for product-level emissions accounting and verification for exporters and their supply chains.

Together, these frameworks increase the value of robust measurement, reporting and verification (MRV), strengthen the premium on lower-emissions routes, and elevate the commercial importance of clean power procurement, scrap strategy, and credible transition capex. They also reinforce a broader message running through this report, that Indian steel companies are being pushed to take green steel more seriously not only by their

**“While demand remains nascent, early growth is most likely to come from public procurement, infrastructure, buildings, and other policy-linked buyers. This means India’s green steel transition will be driven by both supply-side ambition and market creation.”**

own net-zero commitments, but also by a tightening policy, regulatory, and market environment.

India’s production mix explains why transition pathways diverge across firms. A significant share of domestic steel is still produced via coal-linked, ore-based routes. Scrap-based electric steelmaking and Direct Reduced Iron-electric pathways can reduce emissions materially, but scaling is constrained by scrap availability and quality, ore beneficiation requirements, and the pace and cost of power decarbonisation.

This is particularly important in the Indian context. As steel demand continues to grow strongly, domestic scrap availability remains limited compared with more mature, scrap-rich markets, logically constraining how quickly scrap-led decarbonisation can scale. Hydrogen-based reduction and carbon capture offer deep-abatement potential but remain dependent on enabling infrastructure, policy support, and reductions in cost, making near-term execution discipline and intermediate milestones central to credibility. The deeper companies go into the decarbonisation journey, the greater the capex requirement tends to become. Lower-cost efficiency and power measures can improve emissions intensity in the near term, but deeper route shifts require materially larger capital commitments and stronger enabling systems.

Domestic demand for green steel is also likely to matter more as time goes on. While demand remains nascent, early growth is most likely to come from public procurement, infrastructure, buildings, and other policy-linked buyers. This

means India’s green steel transition will be driven by both supply-side ambition and market creation. A natural next step for regulators would be to use the taxonomy and associated standards to support preferential procurement, pilot minimum-use requirements, or phased purchasing standards for selected public assets such as new government buildings and infrastructure projects.

Against this backdrop, the four companies assessed in this report sit at different points on the transition curve:

### **Tata Steel**

Combines a relatively clear route-shift strategy in Europe, anchored in electric arc furnace (EAF) deployment and DRI-EAF transition planning, with a large integrated footprint in India that continues to expand. The transition narrative is strongest where route conversion is explicit and time-bound, but delivery depends on power infrastructure readiness, access to competitively priced clean electricity, scrap availability, and policy support in Europe. The near-term test is execution of route-shift milestones alongside disciplined capital allocation in India. Tata Steel’s exposure to both domestic and international markets also means that it faces a more immediate need to align decarbonisation strategy with external policy and buyer requirements.

### **JSW Steel**

Pairs an operational net-neutral ambition with a capex programme that remains heavily weighted towards integrated capacity expansion. The company is investing in renewables and storage, which can improve emissions intensity and reduce Scope 2 exposure, but the

scale of growth increases the need for credible deep-abatement levers over time. Constraints around scrap availability and ore quality complicate rapid scaling of electric routes. The key credibility question is whether the balance of capex shifts from predominantly growth-oriented integrated additions toward demonstrable route and fuel transitions, supported by MRV readiness for CBAM-facing supply chains. Ambition is visible but the capex profile still opens questions on how quickly deeper decarbonisation levers will be funded and scaled.

### Jindal Steel

Has an ambitious long-term target while remaining heavily exposed to blast furnace-linked production. Ongoing expansion and ramp-up priorities strengthen near-term competitiveness and scale but raise the challenge of decarbonising a larger integrated base. The most plausible near-term pathway is continued intensity reduction through operational efficiency, renewable power procurement, and disciplined execution, while building credible options for deep abatement. Long-term credibility will require clearer sequencing for low-carbon ironmaking inputs, scalable carbon management, and stronger product- and plant-level MRV. The gap lies less in stated intent and more in clearer evidence of sequencing, capital allocation, and the practical route from intensity reduction to deeper structural decarbonisation.

### Jindal Stainless

Starts from a structurally advantaged position because its stainless production route is EAF-based and scrap-linked, making decarbonisation more directly responsive to electricity decarbonisation and renewable procurement. The

company's reported progress on increasing renewable power and its capex alignment provide clearer near-term milestones. Its pathway therefore appears more credible in the near term, though not insulated from upstream input and verification constraints.

Overall, India's steel transition is crystallising into a contest over bankable delivery – which companies can convert targets into measurable emissions-intensity improvements, align capex with route-shift pathways, secure clean electricity and inputs at scale, and build MRV systems that stand up to external scrutiny. Execution across several key pillars – route exposure, capex alignment, enabling-system dependence, and disclosure maturity – will likely determine which firms lead on credible green steel delivery and which face growing commercial and policy risk over time.

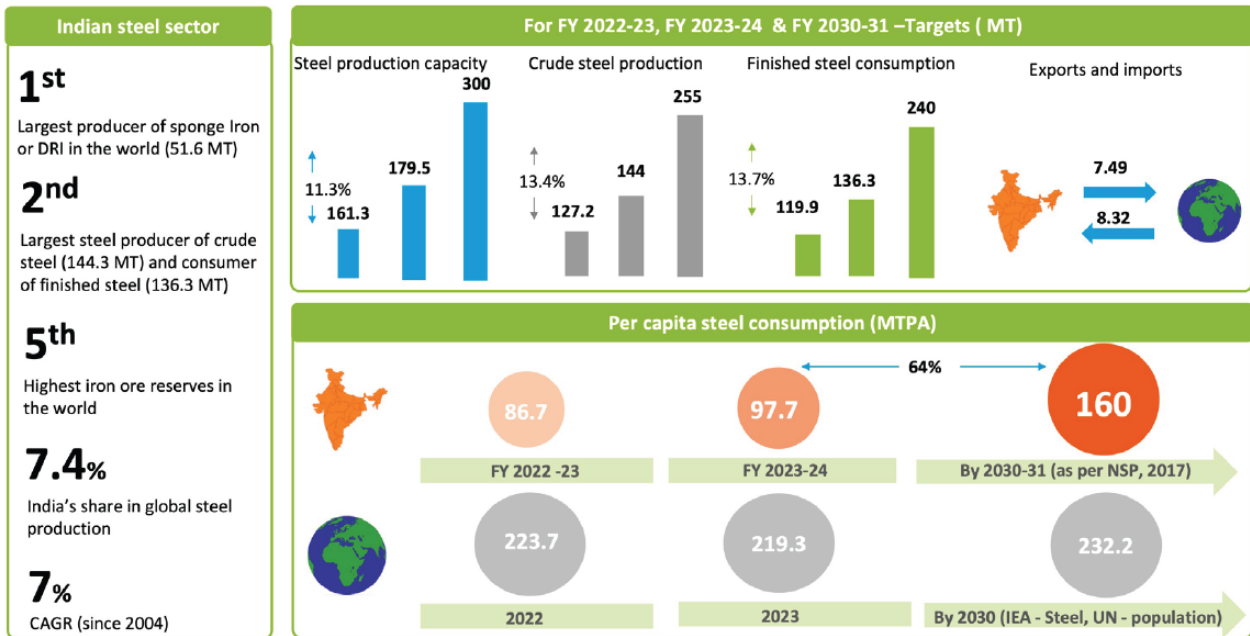
**For companies,** the priority is to move beyond broad commitments and disclose plant-level pathways, interim milestones, and transition capex with greater clarity.

**For regulators,** the next step is to move from taxonomy-setting to market creation by linking standards and certification to procurement, demand creation, and clearer implementation signals.

**For buyers,** especially public and infrastructure-linked buyers, early demand signals will be important to support scale-up and improve the commercial viability of greener steel production in India.

*Note: All currency conversions & market-cap figures in this report are as of 29 April 2026, when USD1=INR94.8.*

**Figure 1: Overview of the Indian Steel Sector**



Source: Ministry of Steel

# 1. Where Steel Sits in India's Net Zero Story

Steel is central to India's growth story, a critical ingredient in the development of transport, housing, power networks, renewables, manufacturing, and urban infrastructure.

As the country's economy accelerates, steel capacity is expanding in lockstep. From 179.5 million tonnes in 2023-24, India's policymakers are targeting 300 million tonnes of crude steel capacity by 2030-31,<sup>1</sup> according to the 2017 National Steel Policy. This would entail an estimated investment of INR10 lakh crore (USD105.5 billion).<sup>2</sup>

This makes transition risk a structural issue. Steel plants are capital-intensive, long-lived assets, so choices made today could lock in emissions and operating costs for decades to come. Steel is therefore a critical factor that will determine whether

India can decarbonise while continuing to industrialise.

## India's steel emissions: a large and high-intensity footprint

India's steel industry emitted 297 million tonnes of CO<sub>2</sub> in 2021-22 while producing 120.3 million tonnes of crude steel. That equates to an average emissions intensity of 2.36 tCO<sub>2</sub> per tonne of crude steel, compared with the global average of 1.85 tCO<sub>2</sub> per tonne.<sup>3</sup> Without a technology shift, emissions could rise further as production scales.

## Why steel is hard to abate – and efficiency alone is not enough

India's steel decarbonisation challenge is two-pronged. The first is an absolute emissions challenge; as steel production expands, sectoral emissions are likely to rise unless process emissions from

## Steelmaking Technicals

### A) Blast Furnace–Basic Oxygen Furnace (BF–BOF)

**What it is:** The classic “integrated” route. Iron ore is reduced to hot metal in a blast furnace using coke/coal as the reducing agent and heat source. Hot metal is then refined to steel in a basic oxygen furnace.

**Why it emits:** The chemistry of the process involves using carbon to strip oxygen from iron ore, which generates large “process emissions” (not just from fuel combustion). This route is typically the highest-emitting pathway per tonne, especially where coal is carbon-intensive and grids are still fossil-heavy.

**Decarbonisation options:** (i) efficiency + waste-heat recovery, (ii) fuel switching and biomass/biochar substitution, (iii) top-gas recovery and improved gas utilisation, (iv) eventually carbon capture, utilisation and storage (CCUS), and (v) partial hydrogen injection to reduce coke rate (currently at the pilot stage).

### B) Direct Reduced Iron (DRI)

**What it is:** Solid state iron ore is reduced to Direct Reduced Iron using a reducing gas, which is traditionally derived from natural gas (lower-carbon than coal) or from coal gasification/syngas, depending on local economics and resource availability.

**Why it matters:** DRI is a key “bridge route” because of the possibility of transitioning from fossil-based to hydrogen-based reducing gas over time.

**Decarbonisation options:** (i) shift from coal-based DRI to gas-based DRI where feasible, (ii) blend and then switch to green hydrogen as the reductant (the deep decarbonisation version), (iii) pair with clean electricity for downstream melting.

### C) Electric Arc Furnace (EAF)

**What it is:** Steel is produced by melting scrap (and/or DRI) using electricity in an EAF.

**Why it can be low-carbon:** Emissions depend heavily on (i) how much of the charge is scrap vs. virgin iron and (ii) how clean the electricity is. In a decarbonising grid with dedicated renewable procurement, EAF becomes one of the most scalable low-carbon routes, providing scrap and quality constraints are managed.

**Key constraint:** Even if EAF is an attractive option, scrap availability and quality (and alloying/contaminant control) could limit how quickly India effects a shift.

conventional routes are avoided, substituted or captured at scale.

The second is an emissions intensity challenge: each tonne of steel must be produced with a lower-carbon footprint through cleaner power, more circular inputs, route shifts, and technologies that offer deeper abatement.

Credible transition strategies need to address both of these challenges simultaneously. A pathway that lowers intensity but leaves total emissions rising sharply is incomplete; equally, a pathway that targets future absolute reductions without visible progress on per-tonne emissions lacks near-term credibility.

Efficiency and operational upgrades can lower emissions per tonne, but they do not eliminate the core carbon base for many plants.

Deep decarbonisation requires changing the reductant (away from fossil and towards hydrogen), changing routes (towards electric steelmaking, where feasible), and/or capturing remaining emissions (CCUS), supported by enabling infrastructure and clean power.

### A credible transition pathway

A realistic pathway entails different stages of action across three time horizons, each with distinct levers, costs, and implementation constraints.

**Near term (now to 2030):** reduce emissions intensity with scalable measures. In the near term, companies can implement measures with existing assets that do not require a full route rebuild.

These typically include:

- **energy and material efficiency measures**, including process optimisation, yield improvements, waste-heat recovery, improved fuel and gas management;
- **increased electrification** (where feasible) and improved power quality;
- **renewable electricity procurement** and captive renewable additions (where regulations and grid conditions allow);
- **improved scrap sorting** and scrap blending strategies (particularly relevant for EAF and secondary producers).

These measures can be executed within existing capex cycles and improve emissions intensity relatively quickly, even when the “end state” route remains unchanged.

**Medium term (2030 to mid-2030s):** shift routes and inputs, build enabling systems.

Medium-term decarbonisation depends on

shifts in route and input, which requires greater coordination:

- **expand electric steelmaking and increase scrap-based charging**, where product specs allow (subject to scrap availability and quality);
- **grow DRI–electric pathways**, which can serve as a bridge toward hydrogen-based reduction over time;
- **build an enabling ecosystem:** high-quality iron ore beneficiation, reliable low-cost clean electricity, and hydrogen supply chains.

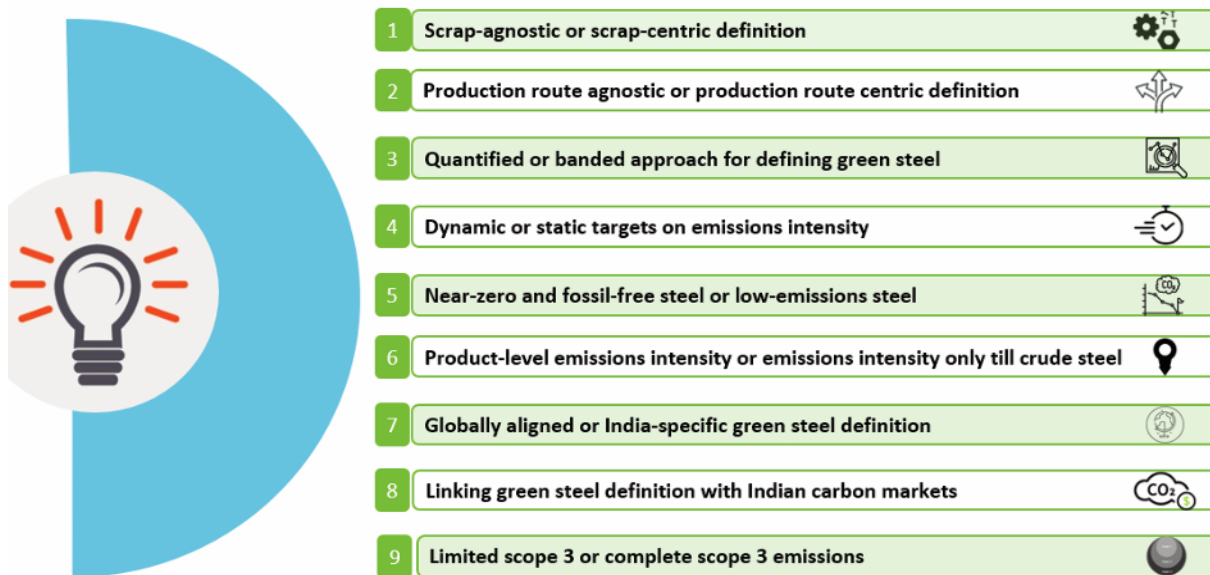
**Long term (beyond 2035):** deliver deep abatement through hydrogen and carbon management.

Deep decarbonisation relies on:

- **hydrogen-based reduction at scale** (and the ability to supply hydrogen at competitive cost and sufficient volume); and
- **carbon capture, utilisation and storage (CCUS)** for residual emissions, particularly for legacy assets where route changes prove unfeasible or uneconomic.

The Council on Energy, Environment, and Water (CEEW) explicitly emphasises CCUS as a critical lever for the sector, reinforcing the view that India will need a residual emissions management strategy.

**Figure 2: Design Considerations for Defining Green Steel in India**



Source: Ministry of Steel

## 2. Policy & Market Environment

### Why policy, regulation, and market signals are pushing green steel up the corporate agenda

India’s steel decarbonisation pathway is shaped by the policy environment of multiple government ministries, the most relevant of which are outlined below. “Green steel” is not governed by a single law or regulator, and it is important to note that green steel is not only a governance issue.

A broader set of forces is aligning to push Indian steel companies to take green steel more seriously. These include companies’ own net-zero ambitions, a tightening domestic policy framework, the creation of a formal Green Steel Taxonomy, and a trade environment in which product-level emissions accounting is becoming commercially material.

These pressures are emerging within a large and growing market. India’s finished

steel consumption rose from 136.3 million tonnes in FY24 to 152.1 million tonnes in FY25, while crude steel production reached 152.18 million tonnes and installed crude steel capacity stood at 200.3 million tonnes.<sup>4</sup> Against that backdrop, the strategic question is whether steelmakers’ route choices, data systems, and capex plans are aligned with a more demanding policy and market environment.

### The regulatory bodies

Multiple ministries are shaping the green steel policy environment:

#### Ministry of Steel (MoS): sector strategy, standards direction, and green steel architecture

The MoS is the primary body that sets strategic policy direction, hosts sector programmes, and acts as the issuing authority for India’s green steel architecture. The anchor strategy document is the National Steel Policy

2017, which sets out demand, capacity, raw-material, logistics, R&D, and energy efficiency objectives. The policy targets 300 million tonnes of crude steel capacity by 2030–31 and 255 million tonnes of production, explicitly linking scale to competitiveness, raw material security, and efficiency.<sup>5</sup>

MoS also issued the Steel Scrap Recycling Policy<sup>6</sup> in 2019 to formalise scrap collection and processing as well as promote a more circular steel system to accelerate electric and scrap-based routes. This is important for India's transition pathway. As steel demand continues to grow strongly, domestic scrap availability remains more constrained than in more mature, scrap-rich markets, limiting how quickly scrap-led electric steelmaking can scale.

**“In practice, the steel transition will need to begin with lower-cost and more immediately scalable actions...”**

#### **Ministry of Power and Bureau of Energy Efficiency: energy efficiency obligations and carbon market design**

Steel is regulated as an energy-intensive industry under India's energy efficiency framework, which was established by the 2001 Energy Conservation Act. Under this framework, the Bureau of Energy Efficiency runs the Perform, Achieve, and Trade (PAT) scheme, a regulatory instrument that targets Specific Energy Consumption reductions in energy-intensive sectors, explicitly including Iron & Steel.

In parallel, the architecture for an Indian Carbon Market has been set up through the Carbon Credit Trading Scheme (CCTS) 2023, which sets out how Carbon Credit Certificates can be issued, verified, and traded through approved exchanges and systems. Government communications in February 2026 reiterated that the CCTS

has been notified with the objective of pricing emissions through certificates trading.<sup>7</sup>

Together, these mechanisms increase the likelihood that energy and emissions performance become more visible, more comparable, and more financially relevant over time.

#### **Ministry of New and Renewable Energy (MNRE): enabling fuel switching via green hydrogen**

Green hydrogen is one of the few plausible long-term deep-abatement levers for ore-based steel routes. The Government of India's National Green Hydrogen Mission has established the mechanism to build supply chains and scale production and use of green hydrogen across sectors.

The MNRE is responsible for overall coordination and implementation of the mission architecture and supporting ecosystem development. However, hydrogen should be understood as a deeper-stage decarbonisation lever.

In practice, the steel transition will need to begin with lower-cost and more immediately scalable actions, with hydrogen becoming more important further along the decarbonisation curve.

#### **What this means for company strategy**

For steel decarbonisation, “policy risk” is not just about one directive. It is a combination of:

1. **MoS strategy and standards** (including green steel definitions);
2. **Energy efficiency obligations (PAT) and emerging carbon market signals (CCTS);**
3. **Enabling infrastructure policies** (renewables and hydrogen) that determine whether route changes can be financed and executed.

Together, these are beginning to change the operating environment for steelmakers. The question is now whether companies

can demonstrate credible transition pathways through better data, cleaner power, route-specific decarbonisation levers, and visible capex alignment.

This is the broader context in which the taxonomy and the EU's Carbon Border Adjustment Mechanism (CBAM) become important. They do not create the transition on their own, but they make weak claims, weak data, and weak execution harder to sustain.

### India's Green Steel Taxonomy is evolving

The Ministry of Steel has formally notified a Green Steel Taxonomy that defines "green steel" using a product-level emissions-intensity threshold and a star-rating ladder.

The threshold definition is:

**Green steel = steel produced with carbon dioxide equivalent (CO<sub>2</sub>e) emissions intensity < 2.2 tonnes<sup>8</sup> CO<sub>2</sub>e per tonne of finished steel (tCO<sub>2</sub>e/tfs).**

The taxonomy introduces a green-rated (star) classification based on how far a plant's emissions intensity falls below the 2.2 tCO<sub>2</sub>e/tfs threshold, with the thresholds to be reviewed every three years.

#### Star rating bands:

- **5-star:** < 1.6 tCO<sub>2</sub>e/tfs
- **4-star:** 1.6–2.0 tCO<sub>2</sub>e/tfs
- **3-star:** 2.0–2.2 tCO<sub>2</sub>e/tfs

### Scope coverage of taxonomy: what emissions are included

The taxonomy is primarily built around:

- **Scope 1 emissions** – direct emissions at the plant, such as coal/coke used in a blast furnace, and
- **Scope 2 emissions** – indirect emissions from purchased electricity.

The taxonomy includes limited Scope 3 coverage up to the finished-steel production stage, capturing embedded emissions in materials and intermediate products but excluding broader upstream

mining, downstream use-phase emissions, and transport emissions outside the defined boundary.

Measurement, reporting, and verification (MRV) is critical. The MoS designates the National Institute of Secondary Steel Technology (NISST) as the nodal agency to manage these three responsibilities and issue certificates and star ratings.

### Why the taxonomy is strategically important

The taxonomy matters for three reasons, each of which directly affect the credibility of corporate transitions:

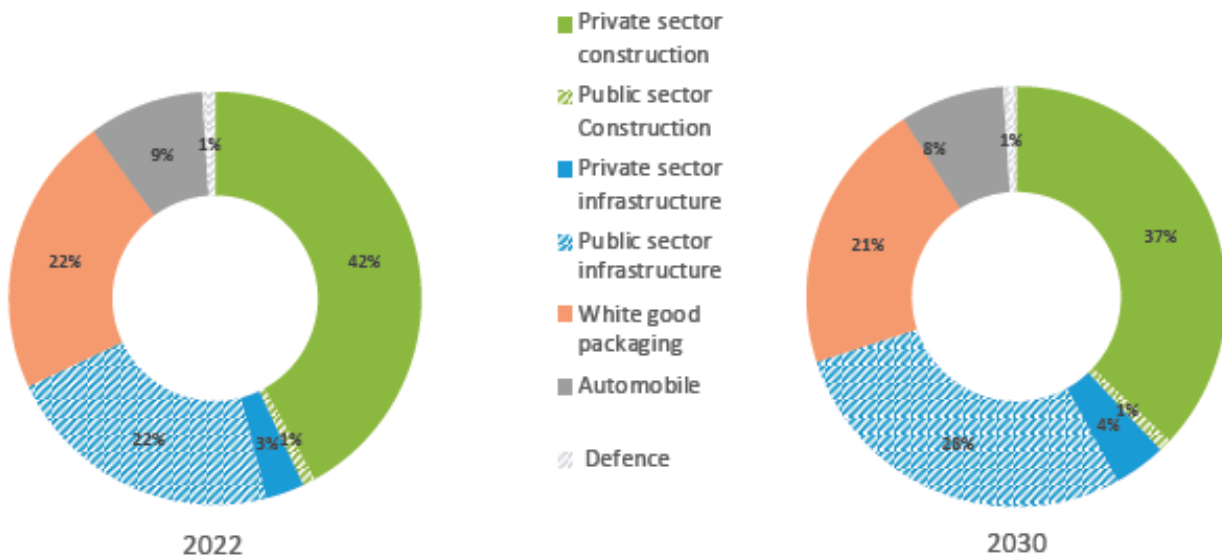
1. **It creates a common MRV language.** Companies can no longer rely on generic "green steel" claims. The taxonomy demands quantified intensity and a rating outcome, making performance comparable.
2. **It is a domestic bridge to demand creation.** A benchmark definition enables green procurement requirements, labelled product lines, and finance frameworks that can reference a government standard.
3. **It strengthens export defensibility.** A robust domestic MRV framework improves industry preparedness to supply jurisdictions and buyers that demand embedded emissions accounting (such as the EU's CBAM) and value chains that require consistent documentation.

The taxonomy is therefore significant in that it begins to create a domestic language for differentiation, procurement, and market creation, helping to shift green steel away from being part of a broad but undefined sustainability narrative and toward becoming an auditable and commercially relevant product category.

### Domestic demand is in its early growth stage

Domestic demand for green steel remains nascent, but likely pools of early adoption are already visible.

**Figure 3: Steel Consumption by Sector 2022-2030 (projected)**



Source: Ministry of Steel

Steel demand in India is being driven primarily by construction and infrastructure, alongside the capital goods and automotive sectors.<sup>9</sup>

Construction/infrastructure, automotive, engineering, and defence are among the major steel-consuming sectors, so the first credible domestic demand for green steel is likely to come not from a fully formed consumer premium market, but from policy-linked and specification-driven buyers.

This is where regulators are likely to play an increasingly important role. India already has a domestic-preference procurement framework for iron and steel products, under the Domestically Manufactured Iron and Steel Products (DMI&SP) policy.<sup>10</sup> Separately, India’s Long-Term Low Emission Development Strategy (LT-LEDS) notes that green procurement policies could help establish green steel demand.<sup>11</sup> A logical next step would therefore be to use the taxonomy and certification system to pilot a green-steel preference framework, and eventually a phased minimum-use standard, in selected public procurement categories, such as central government buildings and infrastructure projects, for which MRV and certification are more straightforward.

### Carbon Border Adjustment Mechanism is driving global demand

The EU’s CBAM moves carbon accounting from voluntary disclosure to mandatory trade-linked compliance requirement for certain goods, including steel. The practical consequence for exporters is that buyers will increasingly require plant- and product-level emissions documentation that can withstand audit and verification. Since six of the 10 largest importers of Indian steel are EU countries,<sup>12</sup> CBAM is a strategically important factor influencing decarbonisation, MRV, and route decisions by Indian steelmakers.

CBAM is designed to mirror the EU Emissions Trading System (EU ETS) cost of carbon, so that imported goods face a carbon cost comparable with goods produced inside the EU. EU operators surrender EU ETS allowances for emissions; EU importers surrender CBAM certificates that “closely reflect the situation of the EU ETS” in both MRV rules and pricing.

### Core operational steps for the steel industry:

1. **An EU importer (or its customs representative) becomes an “authorised CBAM declarant”.** The

EU's guidance explains authorisation requirements and the CBAM registry account structure.

2. **The declarant reports embedded emissions for imported goods.** For iron and steel, the guidance specifies how quantities are reported and how embedded emissions must be calculated and linked to the producing installation.
3. **In the compliance phase, the declarant surrenders CBAM certificates** corresponding to the emissions embedded in the imports (after adjustments allowed by the CBAM rules). Certificate pricing is linked to EU ETS allowance prices, which is based on the EU ETS auction price (quarterly average in 2026; weekly average from 2027<sup>13</sup>).

**“EU buyers will increasingly prefer suppliers who can provide auditable emissions data and offer lower embedded emissions.”**

4. **Data quality becomes critical.** Even where the EU importer bears the formal obligation, steelmakers effectively become responsible for producing credible emissions data because buyers will require it to manage their own CBAM compliance risk.

### **Why steel is impacted more than many other products**

Steel has high direct emissions per tonne for coal-linked routes and a complex product chain. EU guidance explicitly distinguishes system boundaries for precursors and finished products and recognises multiple production routes in the iron and steel sector. For India's producers, this complexity increases the measurement burden and the risk of data errors, both of which can potentially translate into commercial penalties or loss of preferred supplier status.

CBAM creates three intersecting impact layers for Indian steel exporters.

### **A. Strategic impacts**

#### **Market access and customer selection**

**risk:** EU buyers will increasingly prefer suppliers who can provide auditable emissions data and offer lower embedded emissions (or a credible decarbonisation path that reduces future CBAM cost). This will help propagate a shift away from a competitive landscape based on “price + product spec” to one determined by “price + product spec + carbon performance + audit readiness”.

#### **Portfolio and route signalling:**

Producers with higher exposure to coal-linked BF-BOF emissions intensities face steeper competitive hurdles than firms that can scale electric routes or lower-carbon DRI pathways over time. CBAM therefore reinforces the importance of route exposure in corporate strategy.

### **B. Economic impacts**

#### **Carbon-cost pass-through and margin**

**risk:** CBAM links costs to embedded emissions and EU ETS allowance prices. Because certificate prices track EU ETS, CBAM introduces a volatile cost component that can compress margins unless the exporter can either (i) reduce embedded emissions, (ii) negotiate pass-through, or (iii) reposition to markets with lower carbon compliance burdens.

**Price discrimination risk:** Even if the EU importer is the paying entity, commercial practice often reallocates the burden across the supply chain through contract terms, discounts, or supplier preference decisions. Over time, this could create a two-tier market for Indian steel: lower-carbon, data-ready supply chains that defend margins versus higher-emissions supply that competes mainly on price and faces higher volatility.

### **C. Operational impacts**

#### **MRV and traceability as operational**

**capability, not ESG reporting:** CBAM effectively requires plant-level emissions

accounting that's tied to specific goods and installations. The EU guidance sets out reporting requirements and boundaries for the iron and steel sector, including the expectation that embedded emissions be reported per tonne of goods and linked to the relevant installation.

This forces operational changes in:

- **emissions measurement systems and internal controls;**
- **product-to-plant traceability;**
- **data governance and verification practices;**
- **customer-facing documentation readiness.**

**Counterparty risk and lead-time risk:**

EU buyers and importers may require longer lead times for documentation, periodic updates, and verification cycles.

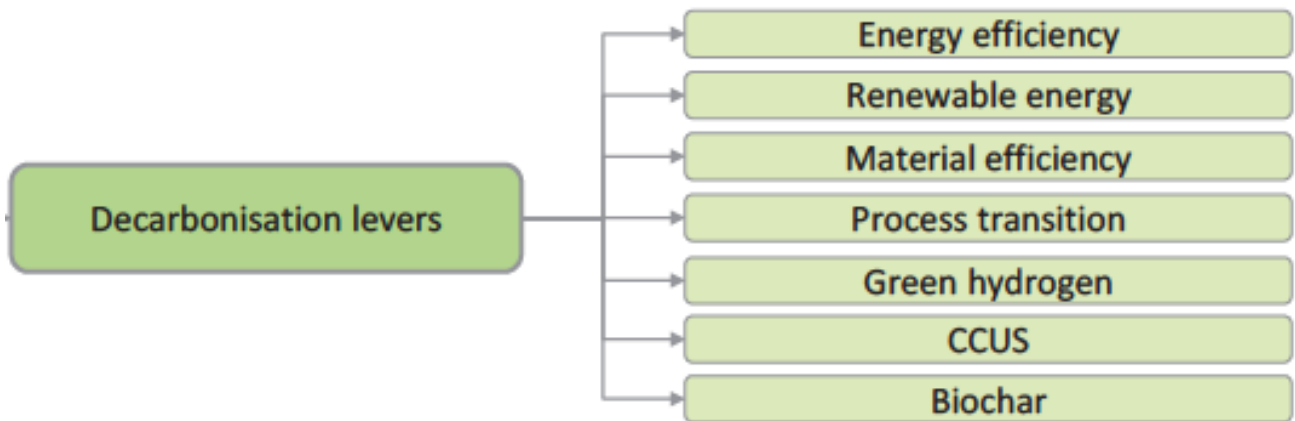
Any mismatch between shipments and compliant documentation can delay customs processes or trigger contract disputes.

CBAM does not present Indian steel with a niche compliance problem but with a core competitiveness constraint for a major export market, with meaningful trade value and broad (though not universal) product coverage.

Together, these forces help explain why the narrative around green steel is evolving into a strategic business imperative.

The next question is how the government expects the sector to decarbonise in practice, and how capital requirements will rise as companies move from incremental improvement to deeper route change.

**Figure 4: Decarbonisation Levers Identified by the Ministry of Steel**



Source: Ministry of Steel

### 3. The Decarbonisation of Steel

#### Roadmap signals, pilots, and the emerging policy toolset

India’s crude steel capacity was reported at 200.33 million tonnes in 2024–25, of which secondary steel plants (including MSMEs) accounted for 94.42 million tonnes, or 47% of total capacity.<sup>14</sup>

India’s plans for global green steel leadership could be accomplished by setting incremental industry decarbonisation targets, implementing policy interventions for a smooth transition, creating enabling conditions, and ensuring just transitions.

At present, India’s broad production mix is a defining structural feature:

- A large integrated segment (BF-BOF) plus a substantial secondary segment (EAF/IF + DRI), with coal playing a central role in both.
- Crude steel pathway shares are roughly 43% via BF-BOF, 22% via

EAF, and 35% via EIF/IF, reflecting India’s dual structure of integrated and secondary steelmaking.<sup>15</sup>

The Ministry of Steel report “Greening the Steel Sector in India: Roadmap and Action Plan” sets out a series of industry decarbonisation levers covering energy efficiency, renewable energy, material efficiency, process transition, green hydrogen, carbon capture, utilisation and storage (CCUS), and biochar.

This roadmap implies a sequencing logic for both policy and capital allocation. Companies can begin with lower-cost, lower-risk measures that reduce emissions intensity within the existing asset base, but deeper decarbonisation requires progressively more planning, enabling infrastructure, and greater capex. In that sense, the government roadmap offers a practical guide to the likely flow of sector transition capex over time.<sup>16</sup>

## A Roadmap to Green Steel

### Stage 1 – Energy Efficiency and Renewable Energy

The first stage of the pathway comprises relatively near-term levers that can be seen as “low-hanging fruit”, such as energy efficiency measures and renewable energy procurement. The government’s own broader low-carbon strategy for industry places energy efficiency first, including the promotion of low-carbon technologies, process optimisation, and market-based mechanisms, while the Ministry of Steel explicitly identifies energy efficiency and renewable energy as core green-transition levers for steel. These measures are important because they can often be implemented within existing operational and investment cycles, and deliver measurable reductions in emissions intensity without requiring a full change in process route. They are therefore the most immediate test of whether a company is moving from target-setting to execution.

### Stage 2 – Material Efficiency and Process Transition

The next stage is more structural, requiring stronger medium-term planning in areas such as material efficiency and process transition. Material efficiency includes improving yields, increasing recycling and scrap use, and reducing avoidable material losses across the value chain. This is particularly relevant in India because the government’s Steel Scrap Recycling Policy recognises that quality scrap is a critical input for electric steelmaking and that India’s scrap requirement could more than double by 2030 as steel demand expands.

Process transition refers to deeper changes in the production route itself, including the shift from coal-based direct reduced iron (DRI) to natural-gas-based DRI, greater electrification, and the move toward lower-emissions steelmaking. These are not merely operational efficiency measures but require companies to make forward-looking decisions on plant configuration, feedstock strategy, raw-material quality, and power sourcing.

### Stage 3 – Green Hydrogen

Green hydrogen sits further along the decarbonisation curve. The Ministry of Steel identifies it as a key lever and is already supporting pilot projects, while acknowledging that hydrogen-based green steel production is not yet commercially viable in India. The government’s current pilots are therefore focused on transitional applications such as partial substitution of natural gas with hydrogen in vertical shaft-based DRI and hydrogen injection into existing blast furnaces to reduce coal and coke consumption. This is why hydrogen should not be treated as the only lens through which steel-company transition credibility is judged today. It is a critical deep-abatement option, but one that depends on cheaper electrolysers, abundant low-cost renewable electricity, hydrogen transport and storage infrastructure, and sustained policy support. In practical terms, it belongs to a later and more capital-intensive phase of the roadmap.

### Stage 4 – CCUS and Biochar

CCUS and biochar sit even deeper in the transition journey. CCUS is particularly relevant for residual emissions from integrated, coal-linked routes that cannot be fully eliminated through efficiency, fuel switching or electrification alone. However, India’s LT-LEDS notes that the economic and technical feasibility of CCUS remains uncertain, with high capital costs, safety and logistics challenges, and high auxiliary power use. It describes CCUS in India as being at the demonstration-project stage rather than ready for large-scale deployment.

Similarly, the Ministry identifies biochar as a potential lever that should be viewed as part of a broader mix of supplementary fuel and reductant substitution options rather than a standalone decarbonisation solution. Both levers belong at the far end of the transition curve. They may be important for deep decarbonisation, but they require more technology development, more policy support, and longer-term capex planning.

## How this roadmap fits into corporate transition journeys

Seen sequentially, these levers point to a clear capex ladder. Energy efficiency and renewable power are the most immediate and generally the least capital-intensive steps. Material efficiency, scrap systems, electrification, and process transition require a more deliberate medium-term reallocation of capital and stronger enabling conditions.

Hydrogen, CCUS, and other frontier technologies sit at the highest end of the capex spectrum and depend on infrastructure, cost reductions, demonstration, and supportive policy.

This staged pattern is also reflected in India's broader long-term low-emissions development strategy. The deeper the decarbonisation objective, the greater the need for long-term capex planning and clearer disclosure.

For this reason, corporate net zero strategies in the steel sector should broadly follow the same roadmap. This is also why capex disclosures are critical. The government has already signalled that steel decarbonisation will proceed through multiple levers, yet most company disclosures still do not clearly distinguish between capex for near-term efficiency

and renewable measures, capex for route shifts and process transition, and capex that remains contingent on longer-term technologies such as hydrogen or CCUS.

Without that distinction, it is difficult to judge whether a company's transition plan is genuinely progressing along the prescribed roadmap, or whether it remains concentrated in incremental improvements and defers deeper structural change.

The Ministry of Steel's roadmap becomes most meaningful when viewed through the companies that will determine whether the sector can actually decarbonise at scale. As Figure 5 shows, a significant share of India's steel capacity is concentrated in a relatively small number of large players, whose actions carry disproportionate significance for the credibility and pace of the country's green steel transition.

The table on the next page maps company actions against these Ministry-defined levers. It shows that the four companies covered in this report have begun to engage with parts of the decarbonisation agenda, but with varying depth, pace, and disclosure quality. In Section 4, we assess how credible each company's transition pathway appears today when measured against route exposure, capex alignment, near-term execution, and MRV readiness.

**Figure 5: Capacity of Integrated Steel Plants, by Company**

Sr No.	Integrated Steel Plants	Capacity 2023 (MT)	States
1	JSW Steel Ltd	28.08	Karnataka/Chhattisgarh/Maharashtra/Odisha/Tamil Nadu
2	Tata Steel	21.5	Jharkhand/Odisha
3	SAIL	20.63	Karnataka/Chhattisgarh/Jharkhand/Odisha/Tamil Nadu/West Bengal
4	AM/NS	9.6	Gujarat
5	JSPL	9.6	Chhattisgarh/Odisha
6	RINL	7.3	Andhra Pradesh
7	NMDC Steel	3	Chhattisgarh
	<b>Total</b>	<b>99.71</b>	

Source: Ministry of Steel

<b>Decarbonisation lever (Ministry/ taxonomy)</b>	<b>Tata Steel</b>	<b>JSW Steel</b>	<b>Jindal Steel</b>	<b>Jindal Stainless</b>
<b>MRV / Green steel certification readiness</b> (taxonomy definition + certification)	<b>Under development</b> (transition plan + reporting alignment)	<b>Under development</b> (green steel positioning in investor material)	<b>Under development</b> (hydrogen-in-DRI framed for low-emissions steel)	<b>Under development</b> (Net Zero roadmap + RE/ hydrogen actions documented)
<b>Energy efficiency &amp; process optimisation</b> (GSI Roadmap "near-term" pillar)	<b>Scaling</b> (continuous efficiency measures; integrated reporting)	<b>Scaling</b> (efficiency + "green steel" pathway in corporate materials)	<b>Not disclosed</b> (in cited sources for this specific lever)	<b>Under development</b> (decarbonisation programme described; efficiency actions referenced)
<b>Renewable electricity procurement / clean power</b> (Scope 2 lever)	<b>Under development</b> (379MW captive RE agreement)	<b>Scaling</b> (~1GW commissioned + ~1.5 GW approved stated on ESG page; green power focus)	<b>Planned / Under development</b> (renewables + hydrogen package for Angul described)	<b>Under development</b> (300MW wind-solar hybrid contract; net zero framing)
<b>Scrap / circularity (increase scrap in charge mix)</b>	<b>Under development</b> (scrap-based EAF plant MoU; recycling push)	<b>Under development</b> (scrap-based EAF route + EAF expansion explicitly in investor deck)	<b>Not disclosed</b> (in cited sources)	<b>Scaling</b> (stainless typically higher scrap role; decarb plan includes circularity; limited specifics in cited sources)
<b>Route shift to Electric Arc Furnace</b> (Electric Arc Furnace (EAF) for scrap/DRI-based steel)	<b>Under development</b> (0.75 MnTPA scrap-based EAF MoU— Punjab)	<b>Under development</b> ("Expansion of EAF at Kadapa" in Oct'25 deck; "Greenfield EAF at Kadapa" in earlier deck)	<b>Not disclosed</b> (route change not explicit in cited sources)	<b>Not disclosed</b> (EAF expansion not explicit in cited sources)
<b>Direct Reduced Iron pathway</b> (Direct Reduced Iron (DRI), incl. hydrogen-ready DRI)	<b>Exploring / Under development</b> (transition pathway references; pilots)	<b>Under development</b> (green hydrogen supply to DRI unit via group commissioning)	<b>Under development</b> (renewable hydrogen integration into DRI at Angul)	<b>Pilot / Under development</b> (green hydrogen plant + integration signals; decarb plan documents this)
<b>Green hydrogen as reductant / fuel switching</b> (Green hydrogen (GH <sub>2</sub> ) pilots are a key Ministry lever)	<b>Pilot</b> (hydrogen injection trial in blast furnace; hydrogen pathway work)	<b>Commissioned</b> (green hydrogen plant commissioned adjacent to JSW Steel; offtake to DRI)	<b>Under development</b> (Phase 1 up to 4,500 tpa renewable hydrogen by Dec 2025; DRI integration)	<b>Commissioned</b> (electrolyser commissioned; ~90 Nm <sup>3</sup> /hr green hydrogen supply stated: used as decarb lever)
<b>Hydrogen injection in Blast Furnace</b> (Blast Furnace (BF) decarb lever for integrated players)	<b>Pilot</b> (record-high H <sub>2</sub> injection trial at Jamshedpur BF)	<b>Not disclosed</b> (BF hydrogen injection not explicit in cited sources)	<b>Not disclosed</b>	<b>Not disclosed</b>
<b>Carbon Capture, Utilisation and Storage (CCUS) / CCU)</b>	<b>Pilot</b> (CO <sub>2</sub> capture from BF gas - ~5 tCO <sub>2</sub> /day demo plant)	<b>Pilot / Exploring</b> (CCUS partnerships + hub study participation)	<b>Not disclosed</b>	<b>Not disclosed</b>
<b>Biomass / alternate reductants</b> (biochar/ biomass etc.)	<b>Not disclosed</b> (in cited sources)	<b>Exploring</b> (alternate fuels referenced historically; not the headline lever in recent decarb docs)	<b>Not disclosed</b>	<b>Not disclosed</b>
<b>Enablers: R&amp;D / partnerships / cluster approach</b>	<b>Scaling</b> (multiple pilots + reporting; CCU + H <sub>2</sub> trials)	<b>Scaling</b> (CCUS consortium + technology roadmap; green steel capex pipeline)	<b>Under development</b> (renewables + hydrogen package; DRI integration)	<b>Under development</b> (partners + contracts for RE/hydrogen pathways)



## 4. Corporate Assessments

This section summarises how credible each major company's transition pathway looks today, based on (i) stated net-zero ambition and interim commitments, (ii) current route exposure, (iii) capex allocation signals from the most recent earnings calls, and (iv) the maturity of disclosures and MRV readiness.

Where targets extend to 2045–2050, the assessment focuses on trajectory credibility and near-term proof points, rather than a binary “will/won’t” conclusion.

### Assessment framework

We judge the “likelihood of meeting stated goals” through five lenses:

1. **Route reality** – how much of today's production remains BF-BOF / coal-linked versus EAF / DRI-electric.
2. **Capex alignment** – whether capex is shifting the asset base towards lower-emissions routes, or primarily

expanding integrated capacity.

3. **Near-term execution plan** – concrete milestones within the next two to five years (EAF build, renewable procurement, scrap ecosystem, pilots).
4. **Enabler dependence** – exposure to constraints outside company control (scrap availability, clean power pricing, hydrogen economics, CCUS infrastructure, policy support).
5. **Disclosure & MRV maturity** – ability to evidence plant/product emissions and provide auditable documentation (relevant for CBAM-facing supply chains).

The table on the next page provides a directional assessment of where each company stands at the time of writing. Ratings are qualitative and reflect our assessment of current pathway credibility. A lower rating does not imply lack of ambition but a larger gap between stated ambition and funded, verifiable delivery.

Assessment lens	Tata Steel	JSW Steel	Jindal Steel	Jindal Stainless
<b>Stated ambition (public)</b>	<b>Net zero by 2045 at group level; ambition supported by explicit route-shift language, especially in Europe.</b>	<b>Net-neutral by 2050 with interim intensity targets and stated decarbonisation levers, but ambition is still more visible than route-shift specificity.</b>	<b>Net zero by 2047 with interim reduction ambition; direction is clear, but pathway detail is still less mature than the headline target.</b>	<b>Net zero by 2050 with 2035 carbon-intensity reduction target; ambition supported by a structurally favourable production route.</b>
<b>Route reality</b>	<b>Medium</b> Clearest route-shift logic among peers, with EAF transition underway in the UK and early EAF progress in India, but group exposure remains materially tied to integrated steelmaking.	<b>Medium-Low</b> Still fundamentally integrated and expansion-led; EAF and alternative-route narrative exists, but current route exposure remains coal-linked at scale.	<b>Low to Medium-Low</b> BF-heavy route exposure remains central; DRI is meaningful but does not yet alter the overall integrated character of the asset base.	<b>High</b> EAF- and scrap-based stainless route gives a structurally better starting point than BF-BOF peers.
<b>Capex alignment</b>	<b>Medium</b> Transition capex is visible, but broader India capex still includes major expansion and legacy-asset spend; route-shift capex is not yet fully separated from wider growth capex.	<b>Medium-Low</b> Capital deployment is substantial, but much of it still appears associated with integrated expansion rather than clearly ring-fenced transition capex.	<b>Medium-Low</b> Capital spend is large, but the current cycle still appears more expansion- and ramp-up-led than route-transition-led.	<b>Medium</b> Capex remains active and supportive, but still needs clearer separation between growth, maintenance, and transition-linked capex.
<b>Near-term execution</b>	<b>Medium-High</b> Concrete milestones exist, including Port Talbot EAF, Ludhiana scrap-based EAF, and renewable-power tie-ups.	<b>Medium</b> Renewables, storage, certification, and process-efficiency actions are meaningful; near-term decarbonisation execution is clearer than deeper route transition.	<b>Medium</b> Hydrogen, CCUS, renewable-energy, and efficiency signals are visible; useful building blocks, but still limited relative to the scale of the asset base.	<b>High</b> Renewable-power penetration, CBAM preparation, and structural route advantage provide strong near-term proof points.
<b>Enabler dependence</b>	<b>Medium-Low</b> Pathway still depends materially on scrap availability, clean power and, in Europe, policy and infrastructure support for DRI-EAF.	<b>Low to Medium-Low</b> Scrap constraints, high-grade DRI dependence, and EAF/hydrogen economics remain material external constraints.	<b>Low</b> Deep-abatement pathway depends heavily on hydrogen economics, CCUS scaling, renewable-power availability, and future policy support.	<b>Medium</b> Still depends materially on clean power availability, upstream alloy-input emissions, and export-side verification architecture.
<b>Disclosure / MRV maturity</b>	<b>High</b> Strongest on disclosure quality, public decarbonisation articulation, and reporting maturity.	<b>Medium-High</b> ResponsibleSteel certification and stronger ESG communication improve credibility.	<b>Medium</b> Sustainability disclosure is improving, but plant-level transition sequencing remains less developed.	<b>Medium-High</b> Stronger on MRV preparedness and export-linked disclosure than most peers, though upstream traceability remains a live issue.
<b>Overall transition credibility today</b>	<b>Medium to Medium-High</b> Strongest on explicit pathway design, but still mixed at group level because Indian expansion remains integrated-heavy.	<b>Medium-Low</b> Credible on efficiency and renewable preparation, but weaker on evidence of structural route transition at current scale.	<b>Medium-Low</b> Credible for incremental intensity reduction; less credible today on a fully articulated route to deep decarbonisation.	<b>Medium-High to High</b> Strongest current positioning in the group, especially for near-term delivery, though not fully insulated from external constraints.

### Net-zero goal

Tata Steel has set a 2045 net zero emissions target.<sup>17</sup> In its FY2024–25 integrated reporting, the company positions the transition as a shift to low-emission steelmaking through a combination of (i) decarbonising existing blast furnace operations and (ii) building new capacity based on EAF routes.

According to FY2024–25 reporting, the following transitions are in plan:

- **United Kingdom:** transition to a 3.2 MTPA electric arc furnace-based steelmaking route at Port Talbot after decommissioning heavy-end assets.
- **Netherlands:** “Green Steel Plan” proposes replacing one blast furnace with a DRI–EAF by 2030 (with a second phase thereafter), subject to policy and financial support.
- **India:** building its first low-emission steel plant using a 0.75 MTPA<sup>18</sup>



Upcoming EAF route based plant in Ludhiana  
Source: Tata Steel • Map data: © OSM • Created with Datawrapper

scrap-based EAF in Ludhiana, Punjab, alongside scrap-system development to support higher scrap use.

## Route Reality

### Transition Credibility Ranking: Medium

Tata Steel remains predominantly an integrated (blast furnace) producer today, with large-scale integrated assets in India and the Netherlands, and EAF capacity largely in the transition / build phase.

#### Route and technology pathway

- **Scrap-based EAF:** Company is building a scrap-based EAF facility in Ludhiana, Punjab, signalling a shift toward higher circularity and electrification.
- **Renewable electricity procurement:** Company announced an agreement to source 379 megawatts<sup>19</sup> of renewable power for its India operations via Tata Power Renewable Energy arrangements, framed as a decarbonisation lever for Scope 2 emissions.
- **Carbon capture pilots:** Company commissioned a pilot 5 tonne/day<sup>20</sup> carbon capture & utilisation (CCU) unit at Jamshedpur, using CO<sub>2</sub> from blast furnace gas for water treatment.
- **Hydrogen in BF:** Conducted a “first-in-the-world” trial of hydrogen injection in a blast furnace at Jamshedpur (large-scale continuous injection trial).
- **DRI as the long-term pivot:** Identifies DRI capable of switching reductants (natural gas/ syngas/hydrogen) as a scalable long-term route, with green hydrogen as the end goal.

Tata has adopted an “optionality” stance; keeping integrated assets competitive while building the EAF + scrap wedge and piloting hydrogen/CCUS to stay credible on deep decarbonisation.

This footprint matters because Tata Steel’s decarbonisation pathway must manage (i) the carbon intensity and coal dependency of BF-BOF assets, while (ii) building out scrap/EAF and DRI-EAF options fast enough to avoid locking in high-emissions capacity for decades.

## Where capex is going

### Transition Credibility Ranking: Medium

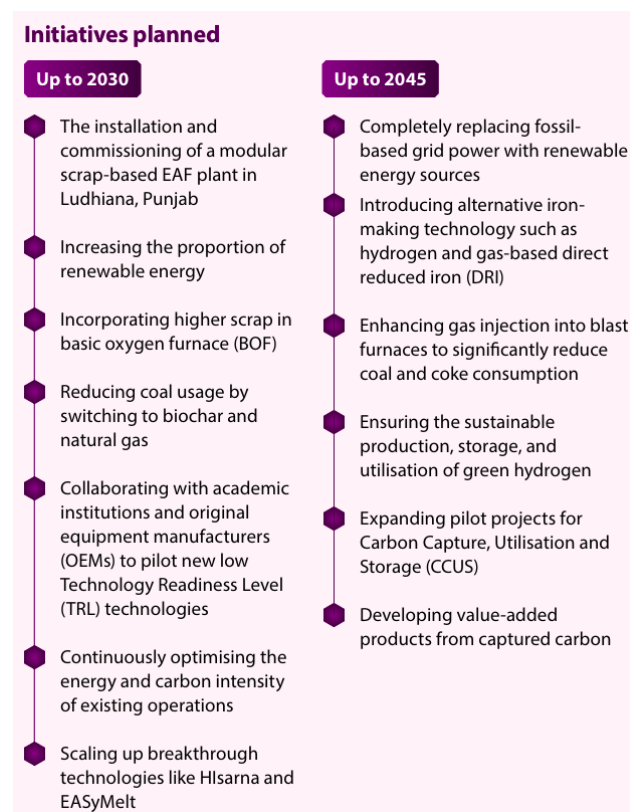
Tata's credibility picture becomes more nuanced when we look at its capex. In FY25, Tata Steel spent INR15,671 crore (USD1.65 billion) in capex. The Ludhiana EAF has now been commissioned with an investment of about INR3,290 crore<sup>21</sup> (USD347 million).

Tata is also tying decarbonisation to power procurement. Its annual report notes a 965.8MW renewable hybrid captive project with Tata Power Renewable Energy that is expected to deliver 379MW to Tata Steel at a 68.6% PLF, supplying more than 2.8 lakh MWh to Jamshedpur and 4.2 lakh MWh to Kalinganagar in FY26.

However, in FY2024–25 disclosures, Tata Steel also notes the completed commissioning of India's largest blast furnace at Kalinganagar as part of the expansion from 3 MTPA to 8 MTPA, with an investment of INR27,000 crore<sup>22</sup> (USD2.85 billion).

For FY26, it guided INR15,000 crore (USD1.58 billion), with around 75% of that targeted toward India operations. This is significant because it shows that even as the group pursues a visible low-emissions transition in Europe and a first scrap-based EAF in India, the bulk of near-term capital allocation is still flowing into the Indian system, where expansion and legacy

Figure 6: Tata Steel Planned Initiatives



Source: Tata Steel

integrated assets remain important.

The capex signal is therefore mixed but credible. Tata is clearly spending on transition assets but it is not yet disclosing its India transition capex with enough granularity to provide a clear separation between spending on route shifting and expenditure on broader growth and maintenance.

## Near-term plan

### Transition Credibility Ranking: Medium-high

In the company's 3Q26 quarterly analyst discussion, management framed near-term execution around:

- India growth plus downstream ramp-up (higher value-added mix via new downstream facilities and approvals), while maintaining cost competitiveness through a structured cost transformation programme.
- Europe restructuring and transition readiness, including progressing the EAF pathway in the UK, where access to high-power electricity and grid infrastructure is a gating factor.
- Sequencing major India brownfield expansions, with the company signalling NINL first, then Meramandali, then Maharashtra/Kalinganagar as the pipeline matures.

## Enabler dependence

### Transition Credibility Ranking: Medium - Low

This remains a real constraint. Tata's own disclosures make clear that the UK transition depends on access to high-power electricity infrastructure, while the Netherlands pathway still depends on Dutch government support and a supportive European policy environment. In India, the Ludhiana route is structurally advantaged, but its scalability still depends on reliable scrap flows and clean power. This means Tata's decarbonisation pathway is more advanced than peers, but still materially dependent on factors outside its direct control. This lens is therefore medium-low.

## Disclosure/MRV maturity

### Transition Credibility Ranking: High

Tata's disclosure quality is among the strongest in the group. Its annual reporting is aligned with Global Reporting Initiative, CDP, and Task Force on Climate-related Financial Disclosures/International Financial Reporting Standards S2-style climate reporting, and it has undertaken third-party climate-risk assessment across key sites. On the operational side, Tata says its Jamshedpur, Kalinganagar, and Meramandali sites are ResponsibleSteel certified. A March 2026 company press release on the Ludhiana project says that more than 90% of Tata Steel India production now comes from ResponsibleSteel certified sites. The company also discloses India/outside-India revenue and export shares, which helps clarify its domestic and international exposure. This is a clear high on the disclosure/MRV lens.

### Challenges and constraints

#### 1. Electricity availability and pricing for EAFs (especially UK/EU):

management explicitly flagged high-power electricity access and grid works as critical to commissioning the UK EAF.

#### 2. Scrap availability and quality:

shifting meaningfully to EAF routes requires reliable scrap systems (collection, processing, quality). Tata's reporting links scrap ecosystem development to its EAF pathway.

**3. Policy dependency in Europe:** the Netherlands DRI-EAF pathway is tied to ongoing discussions on financial/policy support.

**4. Running a "dual system" during transition:** Tata Steel must keep legacy assets viable while funding the capex to transition, raising execution and balance-sheet discipline requirements.

### Domestic and International Footprint

Tata Steel is the most international of the companies analysed in this report, which makes its transition strategy more immediately sensitive to export-facing standards and customer requirements.

In FY25, Tata disclosed consolidated revenue of INR2,18,542.51 crore (USD23.05 billion), of which INR1,26,360.05 crore (USD13.33 billion) came from India and INR92,182.46 crore (USD 9.72 billion) internationally. At the standalone India entity level, export revenue was INR7,700.45 crore (USD812 million), or 6% of revenue. Tata therefore faces both domestic transition pressure and a more immediate need to align with international market requirements, such as lower-emissions steel demand and auditable carbon performance.

## Our analysis

We rate Tata Steel's transition credibility as medium to medium-high. Tata's strongest advantage is that it has moved beyond generic green-steel language into visible route design. The UK EAF project, the Dutch DRI-EAF pathway and the commissioned Ludhiana EAF give Tata clearer structural markers than most peers.

It also has stronger proof points on implementation. Ludhiana is now operational, Port Talbot in the UK has funding and approvals in place, and renewable power integration in India is more concrete than for many peers. On disclosure and MRV, Tata is also clearly ahead of the field.

Where the rating stops short of "strong" is the interaction between capital allocation and asset base. Tata is still growing through an integrated Indian platform that remains the core of earnings and volumes. India delivered 21.7 MT of crude steel and 20.9 MT of deliveries in FY25, and the company's India capex remains substantial.

In other words, Tata is funding both transition and expansion. That does not make the pathway non-credible, but it does mean the group must still prove that India's future growth will progressively move down the decarbonisation ladder rather than simply scale the existing configuration.

The biggest gap is therefore not ambition or action, but the need for clearer India-specific transition sequencing and capex disclosure.

## Suggested Next Steps

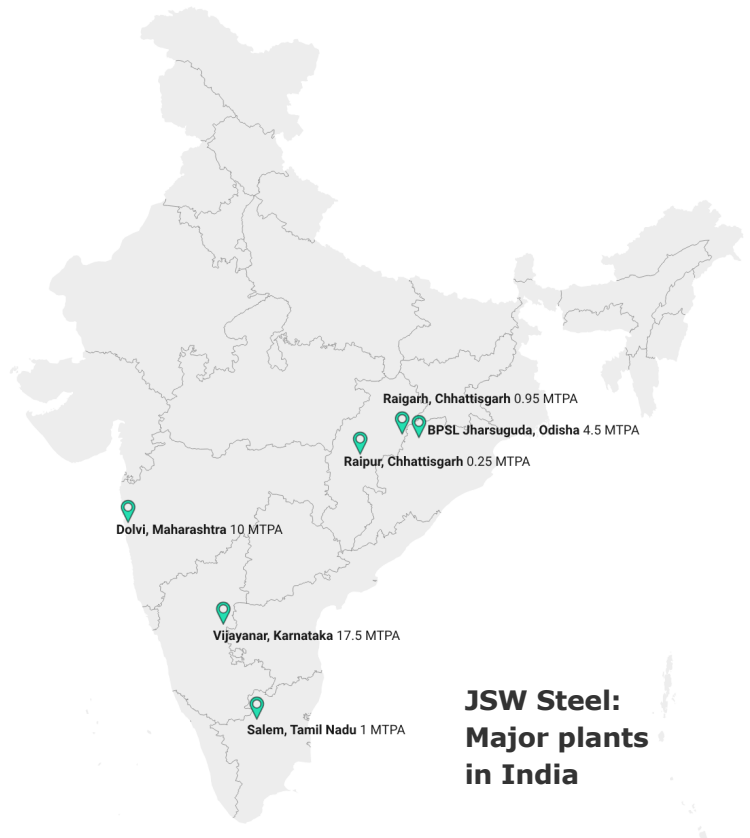
Tata Steel should now make its India transition story as explicit as its European strategy. The company should:

- **Separate transition capex** from generic growth and maintenance capex in its public disclosures.
- **Publish plant-level India milestones** to 2030/2035, especially for scrap use, renewable power share, blast-furnace decarbonisation measures, and any future DRI-EAF or equivalent route-shift options.
- **Explain more clearly** how Ludhiana fits into the wider India pathway: whether it is a pilot-scale circularity asset, the start of a larger scrap-based platform, or one element in a broader India route transition.
- **Given its international footprint,** Tata is well placed to lead on product-level MRV and low-emissions steel disclosure, and should use that advantage to link its transition narrative more directly to product mix, customer strategy and future green-steel positioning.

# JSW Steel

## Net-Zero Goal

JSW Steel has committed to net neutral carbon emissions for operations under its direct control by 2050.<sup>23</sup> Management positions decarbonisation as a combination of (i) energy transition (renewables, storage), (ii) incremental efficiency in blast furnace assets, and (iii) selective low-emission steel routes (EAF + gas/DRI + renewable electricity).



## Route Reality

### Transition Credibility Ranking: Medium-Low

JSW's capacity base is heavily skewed to integrated steelmaking, with the company simultaneously advancing EAF-linked options (Kadapa; Salav low-emission concept) to meet future market requirements.

JSW describes a staged pathway:

- **Near-term:** increase renewable energy share, improve raw-material quality, energy and process efficiency, and increase scrap usage.
- **Medium-to-longer term:** adoption of green hydrogen, transition to more scrap-based EAF capacity, deployment of CCUS.

Its disclosed levers are tightly aligned with the government:

- **Phased approach and levers:** process efficiency, renewable power, beneficiation, biomass, increased scrap use, plus breakthrough technologies.
- **Green hydrogen:** JSW has disclosed a green hydrogen project for steelmaking at Vijayanagar, with an annual capacity of 3,800 tonnes,<sup>24</sup> powered by 25MW<sup>21</sup> of

renewable energy.

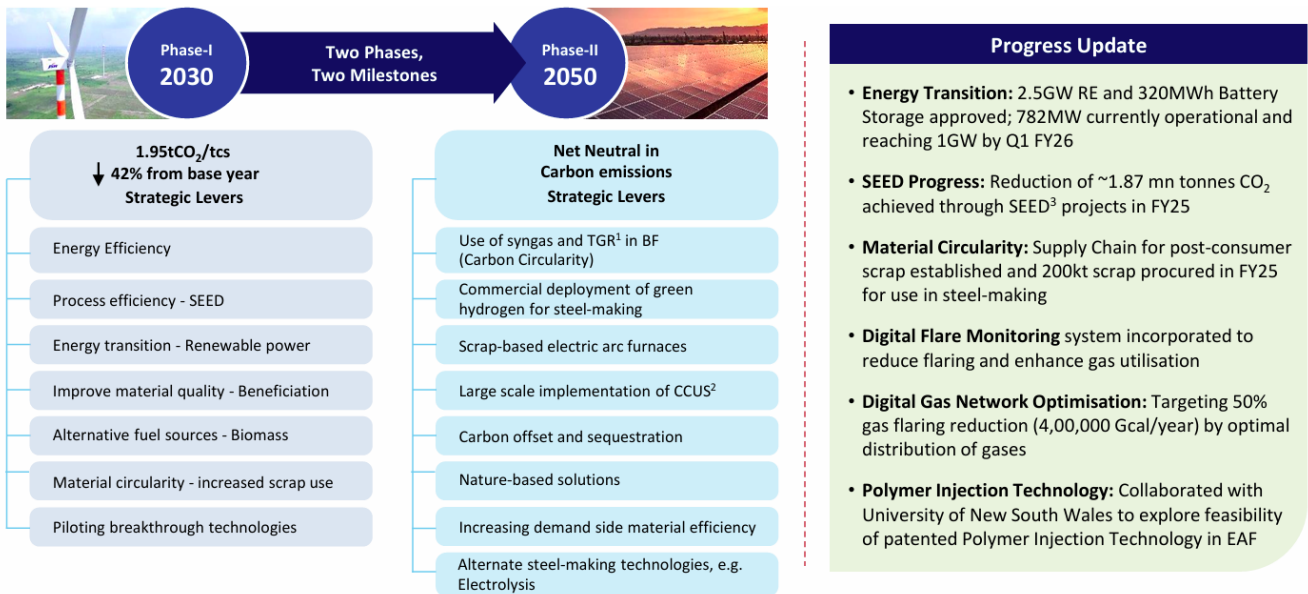
- **Clean electricity + storage:** management reported 1GW of renewable capacity commissioned, and approvals for 2.5GW of generation and 320MWh of battery storage, which are in various stages of construction.<sup>25</sup>
- **CCUS collaboration:** references an industry consortium and CCUS hub study to accelerate decarbonisation.
- **Route shift signals:** mentions scrap-based EAFs and "green steel" growth plans.

JSW is explicitly keeping multiple decarbonisation options open (renewables + scrap + hydrogen + CCUS). The credibility test will be whether the planned EAF and low-carbon initiatives translate into certified low-carbon production under India's taxonomy.

Route signals from management disclosures:

- Management discussed EAF projects (including a 1 MTPA EAF referenced in the latest earnings call) and noted constraints; India lacks sufficient scrap, so EAF economics depend on scrap/high-grade DRI availability.

**Figure 7: JSW Steel Phase Wise Net Zero Approach**



Source: JSW Steel

**Where capex is going**  
**Transition Credibility Ranking:**  
**Medium-Low**

Capex alignment is where JSW’s transition story becomes more mixed. On one hand, the company is visibly spending on energy transition and selected lower-emissions assets. Management said in its Q3<sup>26</sup> earnings call on 23 January 2026 that JSW has already commissioned 1GW of renewable capacity, has approvals for 2.5GW of generation and 320MWh of battery storage, and is advancing multiple projects connected to decarbonisation and operational efficiency.

At the same time, near-term capital allocation remains very large and strongly growth-oriented: JSW Steel guided FY26 capex in the range of INR15,000–16,000 crore<sup>27</sup> (USD1.58–1.69 billion). In the same call, management referenced:

- A new Odisha plant capex of INR31,600 crore (USD3.33 billion) (Phase I).
- A broader forward capex signal: INR100,000 crore (USD10.55 billion) over the next four to five years (as discussed with analysts).

In Q3 of 2026, JSW announced that the Odisha project would operate under

subsidiary JSW Utkal Ltd, with Phase I of 5 MTPA, expandable to 13.2 MTPA, with commissioning targeted by FY30.

The project configuration includes a 5 MTPA blast furnace, 6 MTPA steel melting shop and 6 MTPA hot strip mill. That is a significant strategic growth project, but it is not a transition-first investment; it is still anchored in integrated capacity addition.

This is the key reason the company’s capex lens does not score higher despite its visible renewable and battery investments. JSW is also beginning to signal more specific lower-emissions route options. The Q326 call notes technical and commercial discussions are underway for a 1-million-tonne EAF and structural mill at Kadapa, while management also referred to a green steel / low-emission steel asset at Salav based on an EAF, natural gas, and RE route to serve low-emissions demand, including for Europe-facing customers.

These are important markers because they show that the company is exploring differentiated lower-emissions assets. But at current scale, these remain smaller and less central than the integrated growth programme.

## Near-term plan

### Transition Credibility Ranking: Medium

Based on the Q326 earnings call, JSW's near-term priorities include:<sup>28</sup>

- **Capacity growth with raw-material-linked logistics:** Board-approved 5 MTPA integrated plant at Jagatsinghpur, Odisha, with Phase-I capex of INR31,600 crore (USD3.33 billion) and commissioning by FY30 (expandable to 13.2 MTPA<sup>29</sup>).
- **Energy transition:** management reported 1GW renewable capacity commissioned, approvals for 2.5GW generation and 320MWh battery storage in various construction stages.
- **Preparing for "low-emission steel" demand (Europe-facing):** management reiterated work on EAF / gas / renewable energy routes for low-emission steel (including a specific reference to Salav).

Execution is a strong point for JSW Steel. Along with its renewables projects, the company launched GreenEdge as a low-emission steel brand, backed by more than 1 million tonnes of CO<sub>2</sub> savings certified by Bureau Veritas, and secured ResponsibleSteel certification for four plants covering about 80% of primary steel production. These are not distant promises but visible delivery markers. For this reason, JSW ranks medium to medium-high on near-term execution, especially on efficiency, renewables, branding and market-readiness.

## Enabler dependence

### Transition Credibility Ranking: Medium Low

JSW is explicit about the constraints it faces. In the Q326 call, management stated that large-scale EAFs in India lack adequate scrap, and that EAF economics depend on scrap or high-grade DRI, which in turn relies on imported or blended higher-grade iron ore.

Management also said the quality of domestic iron ore is deteriorating and that imports are being used partly for blending in larger blast furnaces.

That means the deeper-abatement pathway depends materially on factors outside the company's direct control: scrap availability, input quality, gas economics, renewable power and future hydrogen economics. This lens is therefore low to medium-low.

## Disclosure

### Transition Credibility Ranking: Medium High-High

JSW Steel highlights multiple third-party ESG markers, including:

- ResponsibleSteel certification for four plants covering about 80% of primary steel production, and
- Ranking and index inclusion statements (S&P Global CSA, DJSI), plus CDP Supplier Engagement Assessment A-list.

That combination gives it a medium-high to high score on disclosure and MRV maturity, even though plant-level transition sequencing is still not as explicit as it could be.

## Challenges and constraints

**1. Scrap constraint for EAF scaling in India:** management cited limited scrap availability and the dependence of EAFs on scrap or high-grade DRI.

**2. Raw material quality (iron ore grade):** management flagged grade availability concerns and the need to blend with higher-grade imports.

**3. CBAM-facing requirements and MRV readiness:** management stated CBAM is assessed at plant level, with emissions verification work underway and timing dependent on process clarity.

**4. Balancing rapid growth with leverage discipline:** management repeatedly stresses prudence coupled with expansion.

## Domestic and International Footprint

JSW Steel is still predominantly a domestic production and sales story, even though it is more internationally diversified than most Indian peers.

In FY25, its Indian operations sold 25.67 million tonnes, compared with 0.78 million tonnes from Ohio operations in the US. In Q326, Indian operations accounted for 7.42 million tonnes of sales compared with 0.22 million tonnes in Ohio, and the company's own volume split shows Indian operations were 89% domestic / 11% export.

For FY25, the Indian operations sales mix was 92% domestic / 8% export. So while JSW has export exposure and overseas assets, its centre of gravity remains India.

That means CBAM and low-emissions export demand matter, but they are still acting mainly as strategic and product-positioning pressures rather than as the main determinant of volumes.

## Our analysis

**We see JSW Steel's transition credibility as medium-low, though its near-term delivery on efficiency, renewables, and market positioning is stronger than that headline rating suggests.**

**It has a clear long-term ambition, a quantified interim intensity target, visible renewable and storage deployment, better disclosure and MRV readiness than many peers, and a more developed commercial narrative around low-emissions steel through GreenEdge and ResponsibleSteel certification. The company is also building supply-side enablers, product positioning, and some route alternatives, such as Kadapa and Salav.**

**Where the company's credibility weakens is in the interaction between asset base and capital allocation. JSW is expanding from 35.7 MTPA toward 51.5 MTPA by FY31, and the clearest large capex signals still point to integrated growth, especially the INR31,600 crore (USD3.33 billion) Odisha project. JSW is building a stronger decarbonisation platform, but not yet reorienting its capital programme decisively enough for route shifting to dominate its growth outlook. That is why it looks credible on incremental emissions-intensity improvement and low-emissions preparedness, but less convincing on decarbonisation at group scale.**

## Suggested Next Steps

JSW Steel now needs to make three things clearer:

- **Separate transition capex from broader growth capex**, so stakeholders can see how much of the next INR100,000 crore (USD10.55 billion) capital cycle is actually tied to lower-emissions steelmaking rather than generic expansion.
- **Explain more explicitly** how assets such as Kadapa and Salav fit into the wider portfolio. Are they pilot-scale options, niche low-emissions export platforms, or the beginning of a larger route transition?
- **Boost disclosure** on the expected mix of scrap, DRI, natural gas, renewables, and certified low-emissions steel within future tonnage, especially if GreenEdge is to evolve from a branded product into a material strategic platform. That would make the pathway easier to assess against the five lenses used in this report.

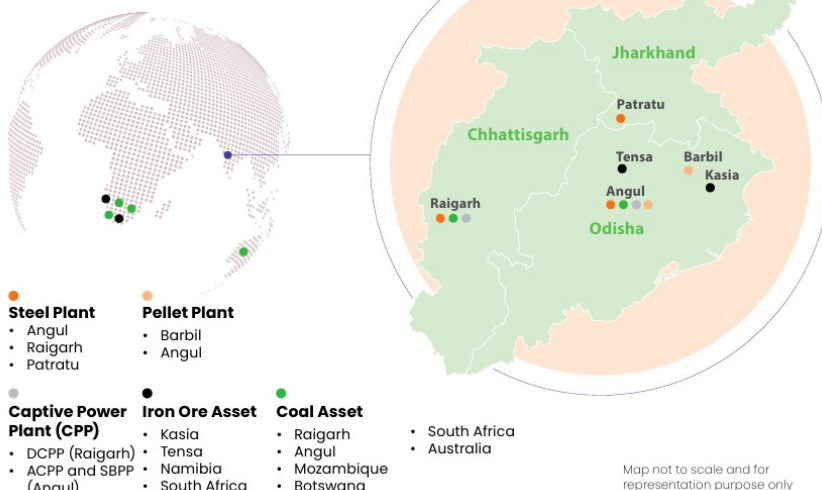
## Net-Zero Goal

Jindal Steel’s FY2024–25 sustainability reporting describes a net-zero 2047 ambition, with an interim commitment to reduce CO<sub>2</sub> emission intensity 30% by 2030 from a 2005 baseline.<sup>30</sup>

The same reporting highlights concrete initiatives already underway, including:

- **Renewables:** targeting 50% consumption by 2030, and
- **CCUS:** reporting 3,600 TPD CO<sub>2</sub> captured at Angul.

### Domestic and global operations



## Route Reality

### Transition Credibility Ranking: Medium-Low

Jindal Steel’s disclosed asset build shows material reliance on integrated routes, with meaningful DRI capacity as part of the iron unit mix.

From its Q226 earnings presentation on 28 October 2025,<sup>31</sup> the company reported the following (existing and expansion capacities, in MTPA):

- **DRI:** currently at 3.12, to be expanded to 5.12
- **Blast furnace (BF) iron making:** currently at 7.3, to be expanded to 11.9
- **Finished steel capacity:** currently at 9.6, to be expanded to 15.6

Total current iron units stand at 10.42 MTPA (DRI share 29.94%; BF share 70.06%).

**Route-relevant signal:** Renewable hydrogen into DRI.

In September, 2024 Jindal Steel had disclosed plans to integrate green hydrogen into its DRI units at Angul. In

the first phase, it targets green hydrogen generation capacity of up to 4,500 tonnes per annum, with commencement targeted by December 2025<sup>32</sup>. However, the commissioning date was pushed to Q4 of 2025-26. Since then there have been no public disclosures to confirm the commissioning of the project.

### Why this is strategically important

- **Green hydrogen into DRI:** Hydrogen substitution into DRI is one of the clearest bridges toward hydrogen-based DRI (and eventually hydrogen-DRI feeding Electric Arc Furnaces), because it can start as blending/substitution rather than requiring a full plant redesign.
- **It is also directly relevant** to export competitiveness and documentation requirements (CBAM).

Jindal Steel is positioned to be a “hydrogen-to-DRI” early mover if execution keeps pace and renewable power and hydrogen economics remain supportive.

## Where capex is going

### Transition Credibility Ranking: Medium

#### Low

The company is investing heavily but the current capital cycle is still led by expansion and ramp-up. In its Q326 earnings call on 31 January 2026,<sup>33</sup> management said Jindal Steel invested INR2,076 crore (USD219 million) in capex during the quarter, taking the cumulative total under its current expansion programme to INR32,925 crore (USD3.47 billion) as of 31 December 2025, against a total announced programme of INR47,043 crore (USD4.96 billion).

The investor presentation for that quarter separately stated that Jindal intends to continue investing in steel and ancillary businesses “with green-tech primarily in India,” while indicating an annual capex

run-rate of INR7,500–10,000 crore (USD0.79–1.05 billion).

The problem is not that transition-linked spending is absent but that it is being deployed within a much larger expansion cycle dominated by scale-up. Jindal’s current capex programme includes ongoing commissioning at Angul, new steelmaking and rolling capacities, captive power, and mining infrastructure. That can coexist with a decarbonisation agenda, but it does mean that the company still needs to show more clearly which portion of future capex is genuinely route-transition-linked and which remains expansion-led.

On the capex lens, therefore, Jindal Steel looks more credible on incremental improvement than on an already-funded route shift.

## Near-term plan

### Transition Credibility Ranking: Medium

In its Q326 earnings call,<sup>34</sup> management prioritised:

- **Completing Phase-1 expansion** and ramp-up at Angul (BF/BOF ramp-up, BOF3 commissioning trajectory), and
- **Scaling productivity/throughput improvements** (including AI-led operational systems), while maintaining capex discipline within the announced programme. They also highlighted external recognition and feasibility work linked to decarbonisation (including an India–Sweden Industry Transition Partnership feasibility project for a CO<sub>2</sub>-neutral steel production facility).

Jindal Steel does have visible transition building blocks, and these are important. Its FY25 sustainability report says the company has published four Environmental Product Declarations (EPDs), is progressing toward 3-star and 4-star green steel certifications for value-added products, and has produced India’s first ultra-low-carbon steel with EPD certification. It also signed an MoU with Jindal Renewables to launch a major green hydrogen initiative in steelmaking and planned the commissioning of 12 TPD alkaline electrolyzers for green hydrogen injection in DRI. It also highlights a 3,600 TPD CO<sub>2</sub> capture initiative at Angul and describes renewable-energy integration and green-hydrogen preparedness as core parts of the roadmap.

These are not insignificant actions. They show that Jindal Steel is moving across multiple Ministry-aligned decarbonisation levers rather than treating hydrogen as a standalone talking point. But they are still better described as transition building blocks than as evidence of route transformation at scale. The company’s near-term pathway looks strongest on intensity reduction, cleaner power, early hydrogen and CCUS readiness, and product-level MRV. It looks less developed on the question of how those elements will reshape the underlying BF-heavy asset base over time.

## Enabler dependence

### Transition Credibility Ranking: Low

Jindal Steel's deeper-abatement pathway depends materially on factors beyond its direct control. Hydrogen deployment depends on low-cost renewable power, electrolyzers, and infrastructure. CCUS depends on offtake, logistics, economics, and policy support, and the company's own disclosures acknowledge that tightening regulation and export-market penalties could affect realised value if decarbonisation is delayed. This makes enabler dependence a significant issue. On this lens, Jindal Steel is low.

## Disclosure status

### Transition Credibility Ranking: Medium

Jindal Steel is showing meaningful improvement. Its FY25 sustainability report is more explicit than earlier disclosures on climate targets, product-level documentation, EPDs, green steel certification readiness, and transition-risk framing. It also states that the company joined SBTi in FY25 and links decarbonisation to both domestic and export-facing regulatory pressures. That is enough to support a medium rating on disclosure/MRV maturity, though the company still needs more plant-level sequencing and clearer disclosure of transition capex.

### Challenges and constraints

- 1. Coal and coke cost/availability risks during ramp-up:** management described higher-cost bought-out coke and operating costs during BF ramp-up phases.
- 2. Execution risk at scale:** moving from commissioning to stable utilisation is pivotal; the company has to convert new assets into durable EBITDA and cash generation to keep leverage within target ranges.
- 3. Technology and MRV readiness for net-zero 2047:** the company's disclosures point to CCUS and renewables, but its integrated exposure means it must still solve the "hard" issues (deep decarbonisation of BF-linked production) within the next capex cycles.

### Domestic and International Footprint

Jindal Steel is best described as a primarily domestic production story with export exposure, rather than as a genuinely international steel producer in the same sense as Tata Steel.

Its steel plants and most of its productive base are in India, and the company describes itself as serving India and more than 35 international markets. But its own FY25 results release says that exports accounted for 6% of sales in FY25, down from 9% in FY24.

The Q326 earnings discussion also referred to export share having fallen to around 6%.<sup>35</sup> So while international market exposure matters, the company's centre of gravity remains India.

## Our analysis

We view Jindal Steel's transition credibility as medium-low. On one hand, the company has genuine transition building blocks in the form of a net-zero target, interim carbon-intensity reduction target, renewable-energy ambition, hydrogen-linked DRI activity, CCUS at Angul, green product documentation, and improving MRV. Those are meaningful positives, and they show that Jindal Steel is not standing still.

On the other hand, the weaker part of the story is how those building blocks connect to the underlying asset base and capital cycle. Route exposure remains BF-heavy, and current capex still appears to be led more by expansion and ramp-up than route transition.

In other words, Jindal Steel looks capable of delivering incremental emissions intensity improvement, better product-level documentation, and stronger transition readiness over the next few years. But the public evidence is still less convincing on the bigger question of how the company gets from pilots, certifications, and partial abatement tools to a structurally lower-emission production system at scale. That is why the rating currently reflects a pathway with credible elements, but an underdeveloped bridge from ambition to full route transition.

## Suggested Next Steps

Jindal Steel should now make four things clearer:

- **Distinguish transition capex** from generic expansion capex, especially within the remaining Angul investment cycle.
- **Publish a more explicit plant-level** sequencing plan showing how DRI, hydrogen, renewable power, CCUS, and any future EAF/syngas-DRI pathways will alter the emissions profile of its largest assets.
- **Clarify whether its current** hydrogen and CCUS initiatives are expected to remain pilots, become partial-abatement tools, or form the backbone of a deeper route transition.
- **Given its progress on EPDs** and green product positioning, the company should link that product-level work more clearly to future tonnes, export strategy, and taxonomy-aligned green-steel outcomes.

# Jindal Stainless

## Net-Zero Goal

Jindal Stainless has a Net Zero 2050 target alongside a mid-term aim to reduce carbon emissions by 50% well before 2035.

The company has also announced a formal commitment to develop SBTi-aligned near-term and net zero targets (listed as “Committed” on the SBTi platform, per its disclosure).<sup>36</sup>



Map data: © OSM • Created with Datawrapper

## Route Reality

### Transition Credibility Ranking: High

Jindal Stainless’ disclosed manufacturing route is explicitly EAF-based, making route reality its biggest advantage:

- It uses stainless steel scrap, iron, nickel, and chromium as raw materials.
- It melts in an EAF and then refines through Argon Oxygen Decarburisation (AOD), with further treatment such as vacuum oxygen decarburisation for high alloy grades.

This is important because it means JSL does not have to solve the same blast-furnace decarbonisation problem as the other three companies in this report. Its transition challenge is therefore less about replacing a highly coal-linked route and more about decarbonising electricity, inputs, and supporting systems around an already more favourable route.

At the same time, this advantage should not be overstated. JSL is still expanding. The company said FY25 annual turnover was INR40,182 crore (USD4.24 billion) and that it is ramping up its facilities to reach 4.2 million tonnes of annual melt capacity by FY27,<sup>37</sup> which means it needs to show that it will preserve its route advantage. So while JSL is starting from the strongest production-route position in the peer group, it still needs to translate that structural advantage into a clearly evidenced transition pathway.

### Technology and procurement pathway

Stainless steel production has a different scrap/ recycling dynamic: stainless is highly recyclable and typically features a higher scrap role.

- **Renewables procurement:** Jindal Stainless signed a contract with ReNew Power to develop a 300MW<sup>38</sup> wind-solar hybrid captive renewable energy project to supply power to its Jajpur facility.
- **Hybrid renewable contract:** the wind-solar hybrid structure is designed to provide higher annual generation per unit of contractual capacity through a combination of wind and solar profiles, supporting around-the-clock industrial demand.
- **Green hydrogen pilot signal:** company communications cite a green hydrogen plant (capacity described in Nm<sup>3</sup>/hr) as part of its emissions reduction toolkit.

The near-term play is clean electricity + efficiency + recycling; hydrogen is positioned more as an additional lever than a full route reinvention.

Jindal Stainless differs in product and process specifics, but the decarbonisation logic still rhymes: reduce Scope 2 through renewables, reduce Scope 1 through process optimisation and fuel switching, and build a credible MRV basis for low-carbon product claims.

**Figure 8: Jindal Stainless Decarbonisation Roadmap**



Source: Jindal Stainless

## Where capex is going

### Transition Credibility Ranking: Medium

Jindal Stainless' capex story is more balanced than those of its integrated peers.

The company has committed resources to decarbonisation; its climate-related disclosures refer to a INR700 crore (USD73.8 million) investment in

decarbonisation initiatives, including renewable energy, green hydrogen and carbon capture technologies.<sup>39</sup>

The company has also said it plans to generate more than 1.9 billion units of clean electricity annually, with potential to reduce carbon emissions by 1.35 million tonnes per annum,<sup>40</sup> supported by round-the-clock renewable projects, floating solar,

and rooftop solar. These are meaningful transition-oriented signals under the capex lens.

On the other hand, the company's overall capital cycle is not purely transition-led. In FY25,<sup>41</sup> management said the company spent about INR4,570 crore (USD482.1 million) on acquisition and capex, while keeping net debt at INR4,005 crore (USD422.5 million).

For FY26, management guided about

INR2,700 crore (USD248.8 million) of capex, with INR2,200 crore (USD232.1 million) already spent in the first nine months.<sup>42</sup>

This indicates JSL is investing actively, but not all of that spend is necessarily decarbonisation-specific. Part of it is tied to acquisitions, spillovers, and broader business growth.

This is why the capex-alignment lens is solid but not unequivocally strong.

## Near-term plan

### Transition Credibility Ranking: High

Based on the Q326 earnings call transcript,<sup>43</sup> management emphasised:

- **Increasing renewable electricity penetration:** renewable power utilisation at Jajpur and Hisar reached 56% of total imported power in Q326.
- **Building CBAM readiness and limiting downside** through inherently lower-emission positioning (scrap-based operations, renewable power, green hydrogen).
- **Continuing project execution** (including an Indonesia SMS project and downstream expansion in India).

JSL's earlier climate disclosures also point to a broader enabling platform: round-the-clock renewable arrangements, floating solar, rooftop solar, and green hydrogen-linked investments. While not all of these are large-scale commercial decarbonisation outcomes yet, they do show that the company is acting across several of the same levers that appear in the Ministry of Steel roadmap. That supports a stronger rating on near-term execution than most peers.

## Enabler dependence

### Transition Credibility Ranking: Medium

Even with a favourable route, JSL still depends materially on external factors: clean power availability at scale, upstream alloy-input emissions, raw-material security, and export-side verification architecture. Management has also highlighted raw-material security as a strategic issue, including overseas nickel-linked exposure and the importance of supply assurance.

## Disclosure status

### Transition Credibility Ranking: Medium High

Jindal Stainless reported:

- An S&P Global Corporate Sustainability Assessment score of 78/100, placing it among the top 5%<sup>44</sup> in the steel sector and 4th globally (as per management remarks).
- Public commitment to SBTi target-setting for near-term and net zero targets, and joining broader net zero campaigns as described in its press release.

## Challenges and constraints

### 1. CBAM uncertainty and verification mechanics:

management stated the EU has issued methodologies and thresholds, but clarity on verification methodology and authorised verifiers remains a key gap affecting compliance certainty.

### 2. Electricity decarbonisation dependency:

the company's trajectory relies on increasing renewable penetration to protect its EAF route advantage in carbon terms.

### 3. Import pressure and trade protections:

management discussed persistent import intensity and ongoing work on trade remedies (anti-dumping investigations) and quality control enforcement.

## Domestic and International Footprint

Jindal Stainless is a primarily domestic production story with meaningful but minority export exposure.

The cleanest entity-level disclosure comes from the FY25 BRSR: JSL reports four plants in India and zero international plants for the reporting entity, while serving 49 countries and deriving about 11.69% of FY25 turnover from exports.<sup>45</sup>

More recent operating data reinforces the same point. In Q326, the company's total sales mix was 94.6% domestic and 5.4% export.<sup>46</sup>

So while JSL has international customers and overseas commercial presence, the core manufacturing base remains domestic.

## Our analysis

**We see Jindal Stainless' transition credibility as medium-high to high. JSL's strongest advantage is structural. It starts from an EAF- and scrap-based route, so the decarbonisation challenge is materially easier than for blast-furnace-heavy peers.**

**On top of that, it is showing credible near-term proof points: a rising renewable-power share, public EPDs, clear emissions-reduction targets, and a visible decarbonisation investment narrative. In other words, JSL has already begun building the systems that support a lower-emissions stainless steel story.**

**Where the rating stops short of a "high" is that the company still depends on external enablers and clearer capex disclosure. Renewable-power integration must continue to deepen, upstream alloy and raw-material emissions remain outside direct control, and the company still has to show more clearly how much of future capex is truly transition-linked versus general growth or acquisition-related.**

**JSL is the best-positioned company in this group for near-term green-steel credibility, but it still needs to convert route advantage into a more fully articulated long-term disclosure framework.**

## Suggested Next Steps

Jindal Stainless should now do three things to strengthen an already favourable position:

- **Separate transition capex** from broader growth and acquisition-linked capex, so that the market can better judge how much spending is actually supporting decarbonisation.
- **Publish more product-level** and plant-level emissions information, building on the EPD work and renewable-power disclosures.
- **Explain more explicitly** how it will manage upstream alloy-input emissions, raw-material security and export-facing verification requirements as it scales toward 4.2 million tonnes of annual melt capacity by FY27. That would make its transition pathway not only favourable in structure, but also clearer in execution logic.

# Conclusion

Transition credibility for Indian Steel companies will be determined less by headline net-zero commitments and more by the quality of route choice, capex alignment and near-term execution.

All four companies in scope have now moved beyond generic sustainability language and are engaging, in different ways, with the same broad decarbonisation levers identified by the Government of India: efficiency, renewable power, material efficiency, route transition, hydrogen, carbon management, and stronger MRV. But the degree to which these levers are embedded in current business strategy still varies sharply across companies.

**Tata Steel** currently shows the clearest explicit route-shift logic, particularly through the Port Talbot EAF transition, the Netherlands DRI-EAF plan and the commissioning of its Ludhiana scrap-based EAF. That gives it stronger pathway visibility than its peers.

**JSW Steel** has built a more developed enabling platform through renewable power, storage, certification, and a lower-emissions product narrative, but its capital cycle is still dominated by large integrated expansion.

**Jindal Steel** has credible building blocks in green hydrogen, CCUS, renewable energy, and product-level documentation, yet its underlying asset base and current capex cycle remain more expansion-led than route-transition-led.

**Jindal Stainless** is the strongest positioned in the near term because its scrap-based EAF route already gives it a structural advantage, and that advantage is being reinforced by renewable integration and better MRV readiness.

These comparisons suggest that the most credible steel transition pathway in India is likely to be sequenced rather than abrupt.

**“The main focus should not be on which company has made the boldest long-term promise, but on which are most convincingly translating a decarbonisation roadmap into funded, phased, and verifiable action.”**

The likely leaders will be those that can show visible progress on lower-cost, near-term levers now, while also disclosing how capex will progressively move toward route transition, cleaner inputs, and deeper-abatement technologies over time.

This is why the distinction between ambition and delivery matters so much. A company may have a long-dated net-zero target, but unless it can show how that target maps onto current route exposure, plant-level milestones, transition capex and external dependencies, the pathway remains only partially credible.

The main focus should not be on which company has made the boldest long-term promise, but on which companies are most convincingly translating the government-aligned decarbonisation roadmap into funded, phased, and verifiable action.

In that sense, green steel leadership in India will not be defined by rhetoric alone. It will be defined by whether companies can align capital allocation, production-route decisions, disclosure systems, and near-term implementation with a pathway that is commercially realistic and increasingly shaped by policy, procurement and trade-linked carbon accountability.

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