Green Steel Production Plant Setup, Feasibility Study, ROI Analysis and Business Plan Consultant

A Detailed DPR Covering CapEx, OpEx, H2-DRI-EAF Process, ROI Analysis, and the Global Opportunity in Hydrogen-Based, Low-Carbon and Net-Zero Steel Manufacturing

Green Steel Production

BROOKLYN, NY, UNITED STATES, May 19, 2026 /EINPresswire.com/ -- Setting up a green steel production plant puts you at the entry point of one of the largest market transformations in industrial history. Conventional blast furnace steel generates approximately 2 tonnes of CO_2 per tonne of steel - making the steel industry responsible for 7–9% of global emissions. The EU's Carbon Border Adjustment Mechanism (CBAM) entered its compliance phase on January 1, 2026, imposing a carbon tariff on every tonne of carbon-intensive steel exported to Europe. For India, which sends approximately USD 5.5 billion of steel to the EU annually, this creates an immediate commercial imperative: produce low-carbon steel or pay a tariff that makes conventional steel uncompetitive.

IMARC Group's [Green Steel Production Plant Project Report is a complete DPR] and green steel manufacturing feasibility study for steel producers, investors, and project developers. It covers the full hydrogen steel plant setup and green steel manufacturing plant cost structure - from renewable energy and green hydrogen production through H2-DRI reduction, electric arc furnace melting, continuous casting, and rolling - with complete green steel plant CapEx and OpEx modelling and 10-year financial projections.

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Three forces are converging to make green steel investment commercially urgent rather than aspirational:

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A green steel plant setup can be configured across several low-carbon production routes, each with different capital intensity, feedstock requirements, and CO_2 reduction potential:

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• □□□□-□□□□□□□□□□□ □□-□□□□: Carbon capture added to existing blast furnace. Reduces CO_2 by 60–80%. Relevant for brownfield upgrades where full H2-DRI transition is not feasible.

• □□□□□□□ □2 □□□□□□□□□□ □□□□□ □□□□: Partial hydrogen blending into existing DRI operations for near-term emission reductions while green hydrogen supply scales up.

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The H2-DRI-EAF route is the most technologically mature path to near-zero emission primary steel production. Each stage is energy-intensive and requires tight integration with renewable energy supply:

• [illegible]: Solar, wind, or nuclear electricity powers the plant. Energy cost and reliability are the primary determinants of green steel manufacturing unit cost. A captive renewable plant or competitive PPA is a financial viability prerequisite

• [illegible] ([illegible]): Renewable electricity powers a PEM or alkaline electrolyser to produce hydrogen. Electrolyser efficiency (typically 50–55 kWh/kg H[illegible]) and hydrogen storage capacity directly affect cost

• [illegible]: High-grade iron ore (>67% Fe) is pelletised to DRI specification. India's lower-grade domestic ore may require beneficiation or imported high-grade pellets

• [illegible]2-[illegible]: Hydrogen reduces iron ore pellets to metallic DRI at 800–950°C. Off-gas is recovered and recycled. DRI metallisation rate and carbon content determine EAF performance

• [illegible] ([illegible]) [illegible]: DRI and scrap are melted using graphite electrodes at 1,550–1,650°C. EAF electricity consumption is the main driver of the 20–25% utility cost share

• [illegible]: Ladle refining and vacuum degassing remove dissolved gases and adjust composition to target grade specification

• [illegible]: Liquid steel is cast into slabs, blooms, or billets. Casting speed and cooling rate determine product quality and yield

• [illegible]: Hot-rolled flat products (HRC, plate) or long products (rebar, wire rod). Cold rolling, galvanising, and coating for value-added grades. Final inspection and dispatch

[illegible]

[illegible]:

• The proposed production facility is designed with an annual production capacity ranging between 1–1.5 million MT, enabling economies of scale while maintaining operational flexibility

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• Gross Profit: 25–35%

• Net Profit: 12–20% after financing costs, depreciation, and taxes

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• Raw Materials (iron ore, pellets, alloys): 60–70% of total OpEx

• Utilities: 20–25% of OpEx - green hydrogen production and EAF operation are the primary energy cost drivers

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• □□□□□□□□□□□□ □□□□□: PEM or alkaline electrolyser stacks, power electronics, hydrogen compression and storage - the largest single CapEx item in a fully integrated H2-DRI-EAF plant

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• □□□□□□□ □□□□: hot rolling mill, coiling and finishing equipment (or purchase from existing adjacent rolling capacity)

• □□□-□□□□□□□□□ □□□□□: technology licence, engineering, commissioning, regulatory approvals, and initial working capital

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The global green steel market is growing rapidly, driven by net-zero commitments, carbon border tariffs, and the accelerating shift away from coal-based steelmaking. Asia Pacific leads global investment, supported by large-scale renewable energy capacity and strong industrial decarbonisation momentum.

□□□□□: India is the world’s second-largest crude steel producer with 149 million tonnes of output in 2024, planning expansion to 300 million tonnes by 2030–31. With EU CBAM now in compliance phase, India’s USD 5.5 billion annual steel exports to Europe depend on transitioning to low-carbon production. JSW Energy commissioned India’s first commercial-scale green hydrogen plant supplying 3,800 tpa to JSW Steel’s Vijayanagar DRI facility under the SIGHT programme (2025). SAIL partnered with Primetals Technologies for hydrogen injection at the Bokaro blast furnace (December 2025). India’s green hydrogen cost of USD 3/kg by 2030 and solar electricity advantage make it a potential global leader in H2-DRI green steel production.

□□□□□□: The most advanced deployment region. HYBRIT (Sweden), SALCOS (Germany), and H2 Green Steel are operational. EU ETS and CBAM together create a regulatory floor for green steel demand. ArcelorMittal signed an 18-year low-carbon electricity agreement with EDF effective January 2026.

□□□□□□ □□□□□□: IRA tax credits support green steel investment. Hyundai Steel is planning a DRI plant in Louisiana alongside a South Korea H2 pilot for 2027. Defense and infrastructure procurement preferences for domestic low-carbon materials create institutional demand.

□□□□□□ □□□□: Oman, Saudi Arabia, and the UAE are developing green hydrogen capacity and positioning for DRI export. Meranti Green Steel signed an MOU for green hydrogen supply for its 2.5 mtpa DRI/HBI project in Oman’s Al Duqm industrial zone (December 2025), with FID scheduled for mid-2026. Low-cost renewable energy and iron ore proximity make the region a future major green steel producer.

□□□□□ □□□ □□□□□ □□□□□: Both have large conventional steel industries facing net-zero compliance deadlines. Hyundai Steel’s pilot DRI facility at Dangjin and Nippon Steel’s partnership with ArcelorMittal at AM/NS India’s Hazira steelworks (1 GW renewables announced December 2025) reflect active transition investment.

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Location decisions for a green steel production plant setup are primarily determined by renewable energy access and iron ore supply:

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• □□□□ □□□ □□□ □□□□□□□ □□□□□□□: India’s Odisha and Jharkhand hold the largest iron ore reserves. H2-DRI requires high-grade pellets (>67% Fe) - higher than typical Indian ore grades. Co-location with pellet plant or secured offtake from high-grade pellet producers reduces this supply chain risk. Alternatively, imported DRI-grade pellets from Australia, Brazil, or Oman can supplement domestic ore

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• □□□□□□□ □□□□□□□□□□: Green steel targeting EU export markets requires access to ports with flat-product handling capability. Hazira (Gujarat), Vizag (Andhra Pradesh), and Paradip (Odisha) are the primary export ports for Indian flat steel products. CBAM documentation and embedded emission tracking from day one is a compliance requirement for EU market access

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IMARC Group’s Green Steel Plant Project Report is a complete green steel manufacturing business plan and technical reference:

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• 10-□□□□ □□□□ □□□□□□□□□□□□: green steel plant OpEx covering iron ore, green hydrogen cost trajectory, electricity, labour, and maintenance over 10 years

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• □□□□□□□□□□□ □□□□□□□□□□: H2-DRI versus gas-DRI hydrogen-ready versus scrap-EAF - CapEx, timeline, and emissions comparison for a low carbon steel production plant

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The report is built for steel producers evaluating a green steel plant investment, infrastructure funds seeking long-duration industrial decarbonisation exposure, export-oriented steelmakers facing CBAM compliance, and banks requiring a bankable green steel manufacturing feasibility study for project financing.

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IMARC Group is a global market research and management consulting firm. Its plant setup and DPR practice serves investors, developers, government agencies, and banks across 50+ countries, delivering reports used for loan documentation, investment approvals, and engineering planning.

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