

# Is Green Steel Within Reach in India?

## Green DRI Economics, Policy Drivers and Site Feasibility in Andhra Pradesh

Summary of the report by Transition Asia and TERI, October 2026.

India's next wave of steel capacity is being planned now. This report prices one real decision inside it: the route for Phase 2 of ArcelorMittal Nippon Steel's greenfield complex at Rajayyapeta, Andhra Pradesh, 9.6 Mtpa to be decided around 2030 and commissioned in 2033. A plant-level model on the site's ore, power and policy position compares three direct reduced iron (DRI) routes, a shaft furnace on pellet and a fluidised bed and a rotary kiln on low-grade fines, with the coal-based BF-BOF, from natural gas to 100% green hydrogen.

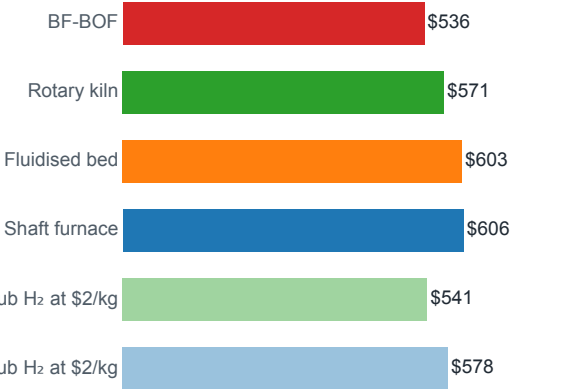


### Key findings

- The green premium is modest and the routes have converged.**  
At 100% hydrogen green steel costs \$571–606/tcs against \$536 for the BF-BOF. The routes sit within \$35 of one another, so the reactor is chosen on iron feed, maturity and emissions.
- The domestic carbon market works through the pace of its targets.**  
A greenfield plant earns no CCTS credit in its first years; its gain is the certificate cost placed on the BF-BOF fleet, \$10–45/tcs by 2035 (\$24/tCO<sub>2</sub> with targets tightening 2% a year, to \$50 with 5%). A common emission-intensity threshold would reward it directly.
- The EU border helps on exported tonnes only.**  
CBAM lands hydrogen-based steel \$179–209/tcs below Indian BF-BOF steel in 2033; India exports 3–5% of its steel.
- Hydrogen is the plan; natural gas is only a fallback.**  
Hydrogen beats gas in the same reactor at \$1.70–2.11/kg. A gas start costs \$531–553/tcs but emits 0.8–1.2 tCO<sub>2</sub>/tcs on imported LNG.
- Procurement matters more than technology.**  
The power contract rests on two concessions, the group-captive surcharge exemption (\$81–94/tcs) and utility banking (\$50–57). Only the base case with both clears a 1.3 times debt-service covenant.
- Hub hydrogen is the largest lever in the plant's own hands.**  
Buying at \$2/kg takes \$1.2 billion of electrolyser capital off the balance sheet and lifts debt cover from 1.65 to 1.93 times.

### Cost of steel at 100% hydrogen, \$/tcs

dark: hydrogen made on site light: bought from the hub



Emissions fall from 2.6 tCO<sub>2</sub>/tcs for the BF-BOF to 0.3–0.6 for the DRI routes on hydrogen.

### Three conditions outside the plant fence decide the outcome

| CCTS targets and carbon price                                                      | Energy-banking envelope                                                                    | Hydrogen hub delivery                                                                                      |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Worth \$10–45/tcs by 2035, depending on the price and on how fast targets tighten. | The plant needs 470–1,555 MW of banked load against a state-wide envelope of about 700 MW. | Pudimadaka near \$2/kg by 2032, with offtake secured; the rotary kiln then lands within \$5 of the BF-BOF. |

### What to do

|                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                |
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| <b>AM/NS India</b><br>Commit Phase 2 to fuel-flexible DRI designed for hydrogen from the start. Report Phase 2 as a separate CBAM installation. Lock in group-captive power and utility banking before the final investment decision. Buy hub hydrogen if it delivers. | <b>Policymakers</b><br>Publish a long-dated path for CCTS reduction targets and signal how the scheme will treat new low-emission capacity. Turn the Green Steel Taxonomy into demand. Expand the banking envelope or support storage. Deliver the hub near \$2/kg. | <b>Financiers</b><br>Underwrite on debt coverage rather than headline cost. The steel price that holds 1.3 times cover is \$590/tcs with hub hydrogen, \$611 making it on site, \$662 for the self-build and \$692 on third-party open access. |
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Costs are the levelised cost of steel in 2025 USD per tonne of crude steel (tcs), 2030 decision year, against a greenfield BF-BOF at \$536/tcs and 2.6 tCO<sub>2</sub>/tcs. CCTS: India's Carbon Credit Trading Scheme; CBAM: the EU's Carbon Border Adjustment Mechanism.  
Transition Asia and The Energy and Resources Institute (TERI), 2026. Model, inputs and results: [repository link]