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Bharat Steel 2026 Summit: Green Steel, Hydrogen, and the Self-Reliance Agenda

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Bharat Steel 2026 Summit: Green Steel, Hydrogen, and the Self-Reliance Agenda

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WHY IN NEWS

The **Bharat Steel 2026 Summit** opens on **April 16-17, 2026** at **Bharat Mandapam, Pragati Maidan, New Delhi**. Ministry of Steel announcements on **April 15** previewed a two-day gathering of **700+ delegates, 100+ speakers, and 200+ exhibitors** — themed around **green/low-emission steel, hydrogen integration, next-generation stainless steel, and self-reliant technology**. It marks India's push to convert its **world No. 2 steel producer** status into a strategic, climate-aligned manufacturing advantage.

INDIA'S STEEL SECTOR — THE NUMBERS

METRIC	VALUE (2024-25)
Crude steel production	**~145 million tonnes (MT)**
World ranking	**2nd (after China)**
Per capita consumption	**~95 kg** (vs global average 220 kg; China 670 kg)
Steel sector's share of Indian GDP	~2%
Employment (direct + indirect)	~25 lakh (2.5 million)
Steel export (2024-25)	~5.8 MT
Steel import dependence (specialty grades)	Still significant in electrical steel, specialty alloys

India's steel output has nearly doubled over the past decade — from ~82 MT (2014) to ~145 MT (2024) — driven by infrastructure spending, automotive demand, and Make in India push.

THE NATIONAL STEEL POLICY 2017 — THE ROADMAP

Adopted by Ministry of Steel, the **National Steel Policy 2017** sets quantitative targets for 2030-31:

TARGET	2030-31 GOAL
Crude steel capacity	300 MT
Crude steel production	255 MT
Finished steel consumption	230 MT
Per capita consumption	160 kg
Exports	24 MT
Investment required	~₹10 lakh crore

At current trajectory (145 MT in 2024-25), meeting 255 MT by 2030 requires **5.5%+ annual growth** sustained over 6 years — challenging but not impossible given pipeline investments.

THE GREEN STEEL IMPERATIVE

Why Steel Decarbonisation Matters

- **Steel is ~7% of global CO_2 emissions**
- India's steel sector alone emits ~2.6 tonnes CO_2 per tonne of steel (vs global avg 1.85; EU 1.3)
- **Coal-based blast furnace (BF-BOF)** route produces 85% of Indian steel — highest-emitting method

Green Steel — What It Is

"**Green steel**" typically refers to steel produced with substantially lower CO_2 emissions via:

1. **Hydrogen-based direct reduction (H-DRI)** — replaces coking coal with hydrogen as the reducing agent; produces iron with water as by-product instead of CO_2
2. **Electric Arc Furnace (EAF)** powered by renewable electricity — melts scrap steel rather than smelting iron ore
3. **CCUS (Carbon Capture, Utilisation & Storage)** — captures emissions from conventional blast furnaces
4. **Bioenergy** — charcoal from sustainable biomass in place of coking coal (Brazil's Aço Verde model)

India's Green Steel Framework (2024-25)

- **Green Steel Taxonomy** (Feb 2025) — defines thresholds for 1-star to 5-star green steel certification based on emissions intensity
- **National Mission on Green Hydrogen (2023)** — ₹19,744 crore — targets 5 MMT annual green H_2 by 2030; ~20% earmarked for steel sector

- **PLI for Specialty Steel (2021)** — ₹6,322 crore — incentivises high-end and electrical steel production

HYDROGEN STEEL — THE TECHNOLOGY LAYER

The Chemistry

Conventional steelmaking: $$ \text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2 $$

Hydrogen-based steelmaking: $$ \text{Fe}_2\text{O}_3 + 3\text{H}_2 \rightarrow 2\text{Fe} + 3\text{H}_2\text{O} $$

The CO_2 by-product is replaced by water. If the hydrogen is **green** (produced from renewable-powered electrolysis), the steel's lifecycle emissions drop by ~80-90%.

Global Green Steel Leaders

COMPANY / COUNTRY	STATUS (2026)
HYBRIT (SSAB, LKAB, Vattenfall — Sweden)	First fossil-free steel delivered 2021; commercial plant 2026-27
Hydnum Steel (Spain)	Under construction; 2.6 MT capacity target
H2 Green Steel (Stegra — Sweden)	5 MT capacity; operational 2026
ArcelorMittal (EU, Gijon & Dunkirk)	Multiple DRI-EAF conversions
POSCO (South Korea)	HyREX (Hydrogen Reduction) pilot
Tata Steel (India / UK)	UK Port Talbot EAF conversion; India DRI pilots
JSW Steel (India)	Hydrogen DRI pilots; Vijayanagar green steel announcement

India's firms are investing but lag Europe in commercial scale — the Summit aims to accelerate this.

INDIA'S STEEL GEOGRAPHY

Major Steel-Producing States

STATE	SHARE OF PRODUCTION	KEY PLANTS
Odisha	~30%	Kalinganagar (Tata), Angul (JSPL), Paradip, Dhenkanal
Jharkhand	~15%	Bokaro (SAIL), Jamshedpur (Tata)
Chhattisgarh	~10-12%	Bhilai (SAIL), Raigarh (JSPL)
Maharashtra	~8-10%	Dolvi (JSW)
Karnataka	~8-10%	Vijayanagar (JSW), Ballari
Telangana / AP	~5-8%	Vizag Steel (RINL), Hyderabad
West Bengal	~5%	Durgapur (SAIL), Burnpur

Key Public & Private Players

- **SAIL** (Steel Authority of India Ltd) — Public; ~20% of Indian production
- **Tata Steel** — Private; ~22% of Indian production; ~30 MT global capacity
- **JSW Steel** — Private; ~27 MT domestic capacity
- **JSPL (Jindal Steel & Power)** — Private; ~10 MT capacity
- **RINL (Vizag Steel)** — Public; under financial stress; strategic divestment on table

STAINLESS STEEL — THE SUMMIT'S SECOND THEME

India is the **world's 2nd-largest producer of stainless steel** (after China) with ~4.5 MT annual production.

Growth Drivers (2026+)

- **Railways** — Vande Bharat, Namo Bharat RRTS coaches use more stainless steel
- **Renewables** — Solar module mounting structures, wind turbine components
- **Automotive** — EV-specific stainless steel grades (lithium-battery casings)
- **Architecture** — Airport terminals, metro stations (stainless is increasingly specified for durability + aesthetics)

Import Dependence Concern

- India imports specialty electrical steel (for transformers) from Japan, South Korea, and Europe

- Duty protections + PLI have reduced this, but gap remains for high-grade CRGO (Cold-Rolled Grain-Oriented) steel

STRATEGIC CONTEXT — STEEL & GEOPOLITICS

India's Global Trade Position

- Surge in Chinese steel exports (2024) pushed Indian domestic prices down; India imposed safeguard duties
- **Carbon Border Adjustment Mechanism (CBAM)** from the EU (effective 2026) — levies carbon tariffs on imported high-emission steel
    - Indian steel exports to EU will face CBAM hit unless certified low-emission
    - **1 tonne of Indian steel** (2.6 t CO_2) pays **much more** CBAM than **1 tonne of EU steel** (1.3 t CO_2)
- **Global Arrangement on Sustainable Steel and Aluminium** (US-EU negotiation ongoing) — could shape future trade architecture

India's green steel push is therefore strategic on **two fronts**:

1. **Domestic**: Decarbonisation commitments (Net Zero by 2070 for India)
2. **Export**: Maintaining access to EU and other climate-sensitive markets

RAW MATERIAL SECURITY

Iron Ore

- **India holds ~8 billion tonnes** of hematite + magnetite reserves (5th globally)
- Self-sufficient in iron ore; actually a net exporter
- **Coking coal** however is **~85% imported** (mainly from Australia) — the Bhushan Steel fire (Feb 2026) and the Australian export flux have shown this vulnerability

Metallurgical Coal — The Gap

- India produces only ~15% of its coking coal needs domestically
- Import bill: ~$12-15 billion/year
- Substitutes: biochar, blue hydrogen (from natural gas + CCUS) — partial; green H_2-DRI is the long-term answer

THE ROLE OF MSMES

- **~70% of Indian steel demand** is served by secondary steelmaking (EAFs, rolling mills) — largely MSME-scale
- Green steel transition at the primary producer level (SAIL, Tata, JSW) is one thing; MSME-scale conversion to EAF + renewable power is harder
- **PLI for Specialty Steel** includes MSME slots but uptake has been modest

SUMMIT THEMES — WHAT TO WATCH

The Bharat Steel 2026 Summit (Bharat Mandapam, April 16-17, 2026) will focus on:

1. **Green Steel Commercialisation Pathways** — roadmap from pilot to 10+ MT
2. **Hydrogen Integration** — how the National Green Hydrogen Mission aligns with Steel Policy 2017 revisions
3. **Stainless Steel Demand Forecast** — architecture, railways, automotive, renewables
4. **Technology Partnerships** — likely signing of JVs with European (HYBRIT, Stegra) and Japanese (NSSMC) technology holders
5. **Raw Material Security** — coking coal alternatives, iron ore export policy review
6. **Finance & Green Bonds** — blended finance for steel decarbonisation
7. **Labour & Skill** — retraining coal-based workforce for hydrogen/EAF operations

UPSC RELEVANCE

PAPER	ANGLE
GS2 — IR	CBAM; Global Steel Arrangement; US-EU trade; India-Japan/Korea technology transfer
GS3 — Economy	National Steel Policy 2017; PLI for Specialty Steel; self-reliance; MSMEs
GS3 — Environment	Steel emissions; green steel taxonomy; Net Zero 2070 alignment
GS3 — S&T	Hydrogen chemistry; DRI vs BF-BOF; CCUS; EAF economics
Prelims	India's crude steel production 2024-25: **~145 MT** (2nd globally) · **National Steel Policy 2017**: 300 MT capacity by 2030-31 target · **Green Steel Taxonomy (Feb 2025)** · **PLI for Specialty Steel (₹6,322 cr, 2021)** · **National Green Hydrogen Mission (₹19,744 cr, 2023)** · CBAM (EU, effective 2026)
Interview	"Can India's green steel transition be commercially viable before 2035 without significant state subsidy, or will the CBAM-driven EU market access pressure force domestic decarbonisation even without subsidy?"

Dates: **April 16-17, 2026** · *Venue:* **Bharat Mandapam, Pragati Maidan, New Delhi** · *700+ delegates; 100+ speakers; 200+ exhibitors · Themes: green steel, hydrogen, stainless steel, self-reliance.*

Crude steel production **~145 MT (2024-25)** · **2nd globally** *after China · Per capita consumption ~95 kg (global avg 220, China 670)* · **National Steel Policy 2017** *target:* **300 MT capacity by 2030-31**.

Green Steel Taxonomy (Feb 2025) · **National Green Hydrogen Mission (2023, ₹19,744 cr)** · **PLI Specialty Steel (2021, ₹6,322 cr)**.

BF-BOF (conventional, coking coal) · DRI-EAF (direct reduced iron + electric arc) · H-DRI (hydrogen-based) · CCUS · Global green steel leaders: **HYBRIT, Stegra, ArcelorMittal**.

EU CBAM (effective 2026) *taxes high-emission steel imports · India's steel at ~2.6 tCO_2/t must become cleaner to retain EU market.*

Iron ore — India self-sufficient (8 BT reserves, 5th globally) · Coking coal **~85% imported** *(mainly Australia) · GS3: Economy + Environment + S&T.*

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