# ISA Coking Coal Summit

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06 November, 2023
The LaLiT, New Delhi

## India's Growing Dominance in

# GLOBAL COKING COAL TRADE >>>>>>>

***"THE JOURNEY TO AMRIT KAAL"***

ORGANISED BY

IndianSteel ASSOCIATION

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# Brief about ISA

The Indian Steel Association (ISA) is the voice of the Indian Steel Industry, in both domestic and global fora. It is at the forefront of all deliberations pertaining to matters of public and regulatory policy, raw materials, international trade, logistics, environmental concerns, technology and other aspects of steelmaking.

The Indian steel industry looks at ISA to further its critical agenda of sustained growth, both in steel production and in generating domestic demand.

ISA was formed in 2014 and represents around 65 % of domestic crude steel capacity. It currently has 7 Executive and 7 Affiliate Members as well as 2 Associate Members. The list of Executive Members includes JSW Steel Limited, Tata Steel Limited, Steel Authority of India Limited (SAIL), ArcelorMittal Nippon Steel India, Jindal Steel and Power, Rastriya Ispat Nigam Limited (RINL) and JSW Bhushan Power and Steel Limited.

Affiliate members are Jindal Stainless Limited, JSW Ispat Special Products Limited, Tata Steel Long Products Limited, ESL Steel Limited, Arjas Steel Private Limited, Orissa Metaliks Private Limited (Rashmi Group) and Rungta Mines Limited,

Associate members include Institute for Steel Development and Growth (INSDAG) and Karnataka Iron and Steel Manufacturers Association (KISMA).

ISA is an affiliate member of World Steel Association (WSA) and is a part of their various technical committees and interacts with them on behalf of the domestic steel industry. It regularly collaborates with WSA in organising events/meetings, and takes part in key meetings with global partners on WSA's platform.

ISA has also entered into MoUs with KOSA, JISF, SEAISI/AISC, NISC, CISA and WCA at the global level and GeM at the domestic level.

# Acknowledgment

We would like to express our profound gratitude to Indian Steel Association (ISA) for engaging and supporting us in preparing this Knowledge Paper for ISA's maiden Coking Coal Summit on 6th November 2023.

This Knowledge Paper presents an overview of global coking coal demand-supply dynamics, the emergence of India as a dominant force in the seaborne market, and how low-carbon transition of the manufacturing sector is likely to redraw the contours of the global met coal market.

During the preparation of this Knowledge Paper, we have received valuable and unconditional support from senior ISA officials and members including technical experts from Tata Steel, JSW Steel, JSPL, and SAIL, and CIL subsidiary BCCL.

# Methodology

This Knowledge Paper is based on a methodology involving the assimilation and collation of data from primary market sources. Primary research apart, CoalMint has accessed macro-level market statistics, for example data on steel production, metallurgical coal demand and imports/exports, etc. from reports and projections prepared by governments and industry bodies. Notably, metallurgical coal has been taken to include PCI coals, too. Similarly, micro or mill-level data have been gathered following one-to-one company-specific interviews and correspondences.

Projections and targets related to production, demand and supply, etc. have been collected from company-specific sources and forecasts have been prepared based on industry averages and widely accepted benchmarks. Significantly, the data sample size is expansive, covering an overwhelming segment of the market under review and is, therefore, highly representative.

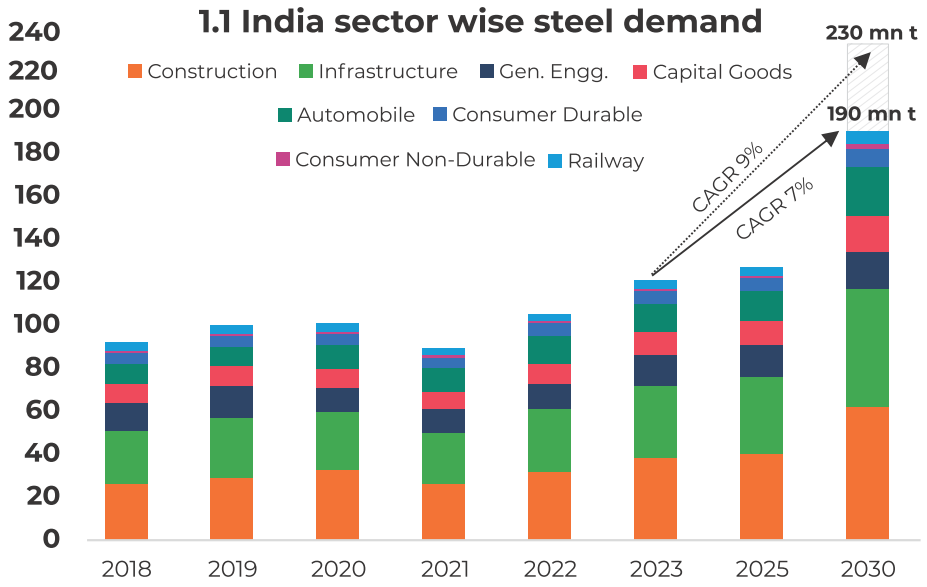
It deserves mention that in specific cases CoalMint has diverged from data points forecasted by the government or government sources and has instead based its analysis on own alternative data generated from primary sources. A case in point is India's crude steel production capacity in 2030. In such instances, divergence from government data has been deemed necessary in order to facilitate realistic approximations and forecasts of the market.

# Index


- **India's steel demand to grow at 7% CAGR till 2030** 4
  - 1.1 India sector wise steel demand
- **India's steel production to grow over 45% in 2030** 5
  - 2.1 Global steel production (in mn t)
- **World shifting to EAFs but India, SE Asia to witness trend reversal** 6
  - 3.1 Global routewise crude steel production
  - 3.2 Race to net zero : Carbon neutral goals by country
- **India's steel capacity & production – outlook to 2030** 7
  - 4.1 Crude steel capacity & production
  - 4.2 BF-BOF share will increase to 55%
  - 4.3 India Crude steel capacity state-wise
- **Raw material demand scenario & metallic mix –2030** 8
  - 5.1 India's raw material requirement for steel production
  - 5.2 India: Crude steel metallic mix
- **Synopsis of global met coal market** 9
  - 6.1 Met coal market at a glance
  - 6.2 Global metallurgical coal production
- **Seaborne metallurgical coal supply-demand overview** 10
  - 7.1 Seaborne metallurgical coal supply
  - 7.2 Metallurgical coal consumers
- **Shifting dynamics of global met coal demand** 11
  - 8.1 Countrywise met coal demand
- **India's metallurgical coal demand projected to grow 60% from 2022-2030** 12
  - 9.1 India's metallurgical coal demand
- **Can India increase blend of domestic coking coal?** 13-14
  - 10.1 Landscape of domestic coking coal
  - 10.2 Increasing coking coal production from existing mines
  - 10.3 Coking coal washeries in India
- **Recent and upcoming auctioned commercial coking coal mines** 15-17
  - 11.1 Coking coal blocks sold under commercial mining auctions
  - 11.2 Future coking coal blocks allocation
- **Outlook** 18-22
  - 12.1 Global Met Coal demand
  - 12.2 Met Coal Seaborne trade
  - 12.3 Percentage share of different technologies in steel production by 2070
  - 12.4 Comparing India's share of metallurgical coal on the global stage
  - 12.5 Demand supply gap of domestic raw coking coal
  - 12.6 Demand supply gap of coking coal washing capacity
- **Abbreviations** 23

# India's steel demand to grow at 7% CAGR till 2030

In 2030, India's steel demand is projected to reach 190 million tonnes (mn t), largely fuelled by the construction and infrastructure sectors contributing 60-63% to the total demand, followed by auto and general engineering. Factors like population growth, urbanisation, and government housing initiatives will boost steel demand.




India to become world's third largest economy by 2030 per capita steel consumption expected to increase from the current level of around 85 kg to 160 kg.

Some key government initiatives driving steel demand are Bharatmala, Sagarmala, dedicated freight corridors, PMAY, PLI scheme for different sectors, etc.

SteelMint predicts steel demand at 190 million tonnes by 2030 based on 7% CAGR. In the best-case scenario with an 8-9% CAGR growth, the expectation is 230 million tonnes by 2030. The Covid-19 pandemic has pushed the target date 2-3 years ahead.

| Sector | Demand in 2023 (mn t) | % share in 2023 | Demand in 2030 (mn t) | % share in 2030 |
|---|---|---|---|---|
| **Construction** | 37 | 31% | 63 | 33% |
| **Infrastructure** | 34 | 28% | 55 | 29% |
| **Automobile** | 13 | 11% | 23 | 12% |
| **Gen. Engg.** | 14 | 12% | 17 | 9% |
| **Capital Goods** | 11 | 9% | 17 | 9% |
| **Consumer Durable** | 6 | 5% | 8 | 4% |
| **Railway** | 4 | 3% | 6 | 3% |
| **Consumer Non-Durable** | 1 | 1% | 2 | 1% |
| **Total** | **120** | **100%** | **190** | **100%** |

Quantity in mn t | Data in Financial year

Note- A Financial Year (FY) starts on 1st April and ends on 31st March. | Source: SteelMint, Ministry of Steel

# India’s steel production to grow over 45% in 2030

India, the second-largest steel producing country in the world today, is set to achieve a notable 46% growth in 2030, with production expected to reach 210 mn t at a CAGR of 7%. With significant investment and government support, India's steel sector will thrive, aligned with the 'Make in India' initiative to create world-class infrastructure. This vision positions India as a prominent steel player contrasting with China's efforts to reduce crude steel production.

## 2.1 Global steel production (in mn t)

| Country | 2022 | 2025 | 2030 | % Change Y-o-Y | Remark |
|---|---|---|---|---|---|
| **China** | 1,018 | 977 | 858 | ↓ 12 | China aims to reduce steel production as steel demand plateaus and aligned with its broad objective of low-carbon industrial transition |
| **JKT** | 176 | 195 | 190 | ↓ 3 | Declining population, slowing economic growth and carbon neutrality goals to weigh on steel production |
| **Americas** | 170 | 185 | 195 | ↑ 5 | Production growth attributed to population growth in the region |
| **EU 27** | 136 | 162 | 170 | ↑ 5 | Production expected to increase on government subsidies to build eco-friendly steel capacities |
| **India** | 125 | 145 | 210 | ↑ 45 | Demand will continue to increase on government spending on infrastructure. The 'Make in India' initiative will transform India into a global manufacturing hub |
| **MENA** | 102 | 118 | 130 | ↑ 10 | Rising domestic demand and access to natural gas will support steel production |
| **CIS** | 78 | 90 | 110 | ↑ 22 | Steel demand and production to be supported by post-war reconstruction activities |
| **Other Asia** | 63 | 74 | 97 | ↑ 31 | South east asian to see capacity expansion on Chinese investments. |
| **Total** | **1,868** | **1,948** | **1,966** | ↑ 1 | |

Quantity in mn t

JKT : Japan, Korea, Taiwan | Americas : North America, South America | MENA : Turkey, Africa, Middle East Countries

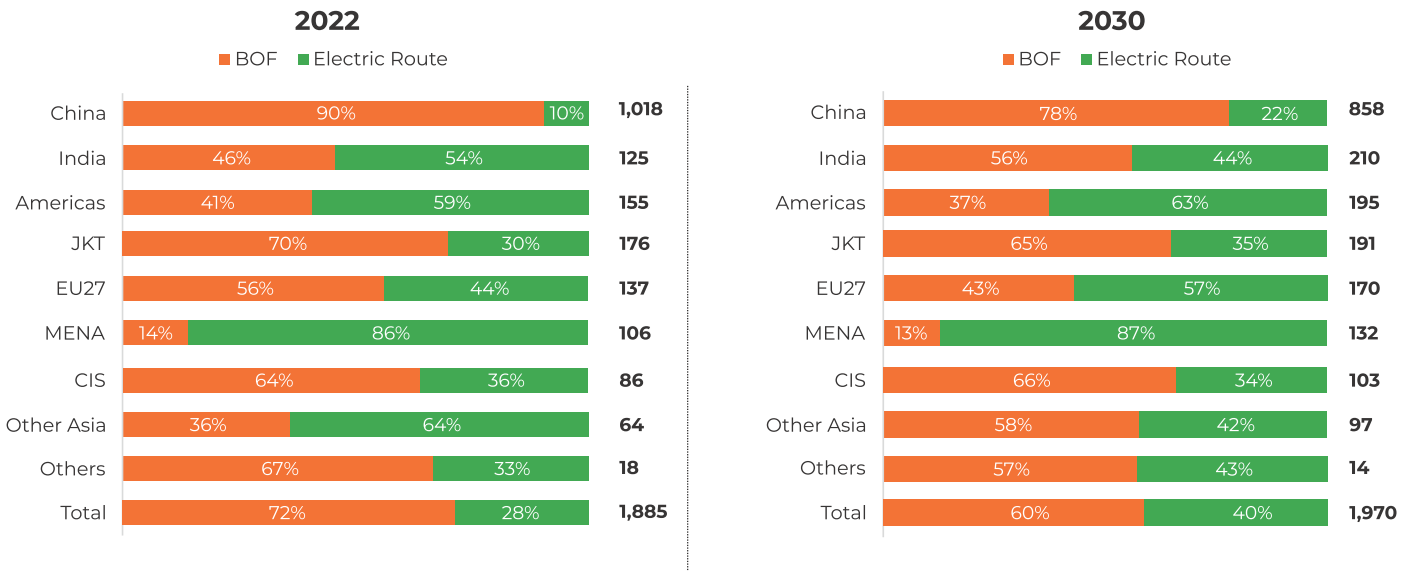
CIS : Russia, Ukraine, Others | Other Asia : South East Asia, Others

Source: SteelMint, IEA

# World shifting to EAFs but India, SE Asia to witness trend reversal

The global steel industry is gradually pivoting to electric-arc furnaces (EAFs), a cleaner alternative to the blast furnace (BF), in order to meet carbon neutrality goals. Globally, the ratio of BF-BOF: EAF is likely to change from 70:30 at present to 60:40 in 2030. For instance, China is expected to reduce BF-BOF steelmaking from 88% in 2022 to an estimated 78%, while increasing the EAF share from 12% to 22% by 2030.

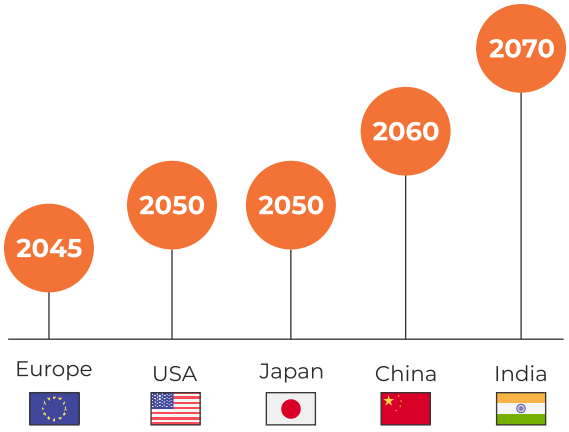
## 3.1 Global routewise crude steel production




With approximately 80 mn t of steel production capacity to be added in India by 2030, 66% will be through the BF-BOF route, with nearly 90% of it projected to be operational by 2030.

Currently, BOF and EAF contribute 46% and 54%, respectively, to steel production in India. However, by 2030, this ratio is expected to hange to 56% BOF and 43% EAF, resulting in 121 mn t produced by BOF and 95 mn t by EAF.

## 3.2 Race to net zero: Carbon neutral goals by country




Quantity in mn t | Electric route includes EAF and IF

JKT : Japan, Korea, Taiwan | Americas : United States, Mexico, Canada, Brazil | MENA : Turkey, Africa, Middle East Countries

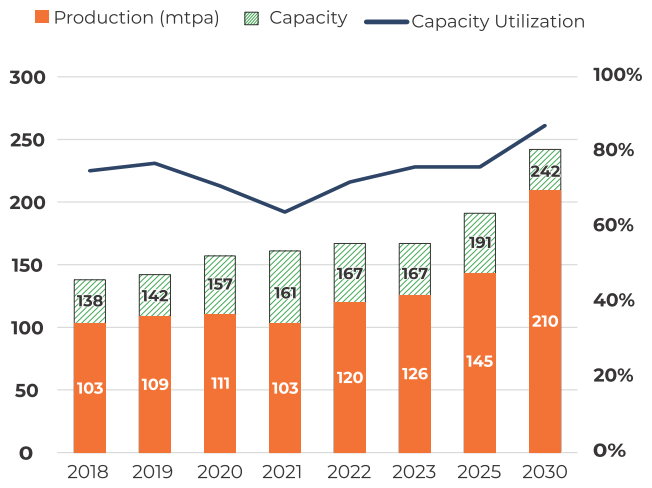
CIS : Russia, Ukraine, Others | Other Asia : South East Asia, Others

Source: SteelMint, WSA

# India's steel capacity & production – outlook to 2030

India aimed to achieve a steel capacity of 300 million tonnes by 2030-31 according to the National Steel Policy 2017. While the steel industry was making progress, the Covid-19 pandemic has set back the target date by 2-3 years.

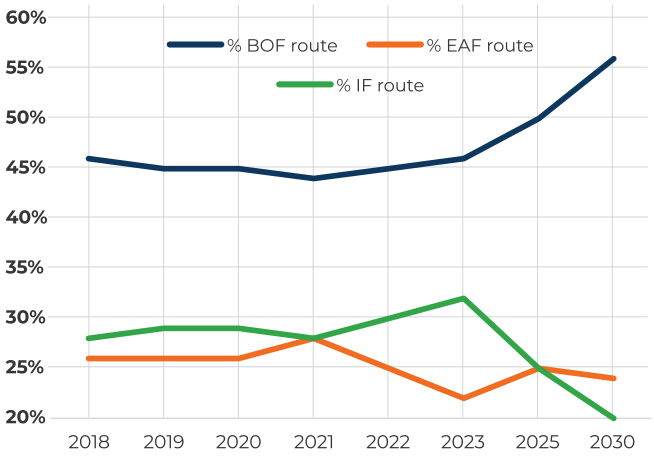
## 4.1 Crude steel capacity & production




*Quantity in mn t | Data in Financial year*

*Note- A Financial Year (FY) starts on 1st April and ends on 31st March.*

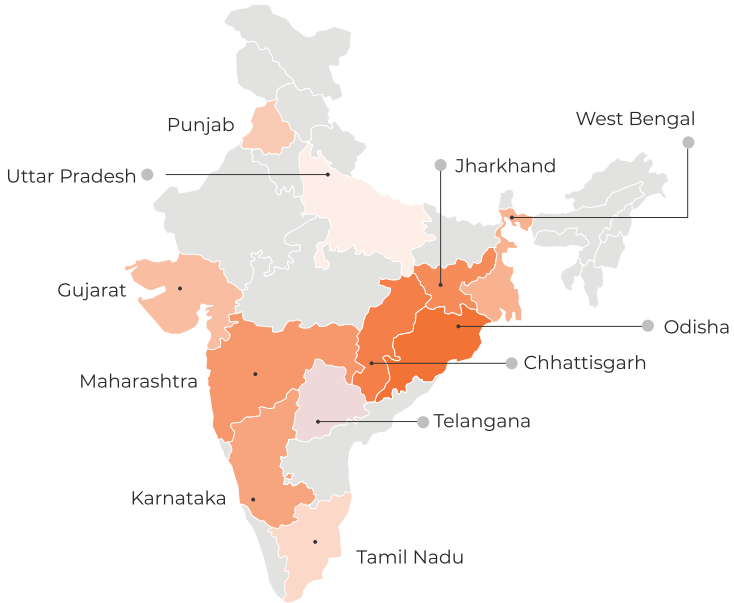
## 4.2 BF-BOF share will increase to 55%




*Quantity in mn t | Data in Financial year*

*Note- A Financial Year (FY) starts on 1st April and ends on 31st March.*

## 4.3 India Crude steel capacity state-wise




| State | 2023 | 2025 | 2030 |
|---|---|---|---|
| Odisha | 30 | 40 | 60 |
| Chhattisgarh | 25 | 29 | 36 |
| Jharkhand | 21 | 21 | 25 |
| Maharashtra | 19 | 20 | 21 |
| Karnataka | 17 | 23 | 24 |
| West Bengal | 15 | 16 | 19 |
| Gujarat | 14 | 14 | 21 |
| Punjab | 6 | 6 | 7 |
| Tamil Nadu | 4 | 5 | 6 |
| Telangana | 3 | 3 | 3 |
| Uttar Pradesh | 1 | 1 | 1 |
| Others | 12 | 13 | 18 |
| **Total** | **167** | **191** | **242** |

*Quantity in mn t | Data in Financial year*

*Note- A Financial Year (FY) starts on 1st April and ends on 31st March.*

*Source: SteelMint, Responsible Steel, KPMG*

# Raw material demand scenario & metallic mix –2030

India's steel production growth via the BOF route, aiming for 140 mn t of hot metal output in 2030, will require 116 mn t of metallurgical coal. The primary focus is on bolstering production through the BF route, while the steel scrap route is expected to witness slower growth on domestic availability concerns.

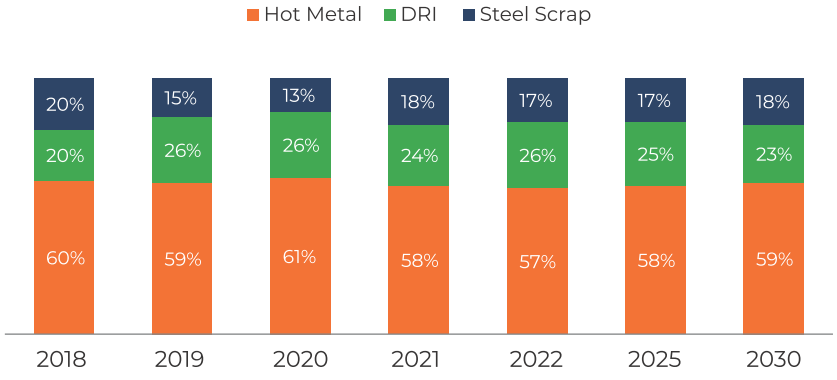
## 5.1 India's raw material requirement for steel production

| India: Raw Material Requirement | 2018 | 2019 | 2020 | 2021 | 2022 | 2025 | 2030 |
|---|---|---|---|---|---|---|---|
| **Crude Steel Production** | 105 | 111 | 100 | 118 | 125 | 145 | 210 |
| **Hot Metal** | 73 | 74 | 68 | 78 | 80 | 94 | 140 |
| **DRI** | 28 | 37 | 33 | 37 | 41 | 48 | 65 |
| **Steel Scrap** | 24 | 19 | 17 | 25 | 26 | 29 | 45 |
| **Met Coal** (incl. PCI) | 69 | 70 | 65 | 70 | 71 | 82 | 117 |
| **Non Coking Coal** | 28 | 38 | 33 | 38 | 40 | 46 | 67 |
| **Iron Ore** | 167 | 185 | 187 | 176 | 200 | 240 | 350 |

Quantity in mn t | Data in Financial year

Note- A Financial Year (FY) starts on 1st April and ends on 31st March.

## 5.2 India: Crude steel metallic mix




The metallic mix ratio for crude steel production will remain constant. The government is also working on policies for scrap generation even though the BF & DRI route will remain prominent.

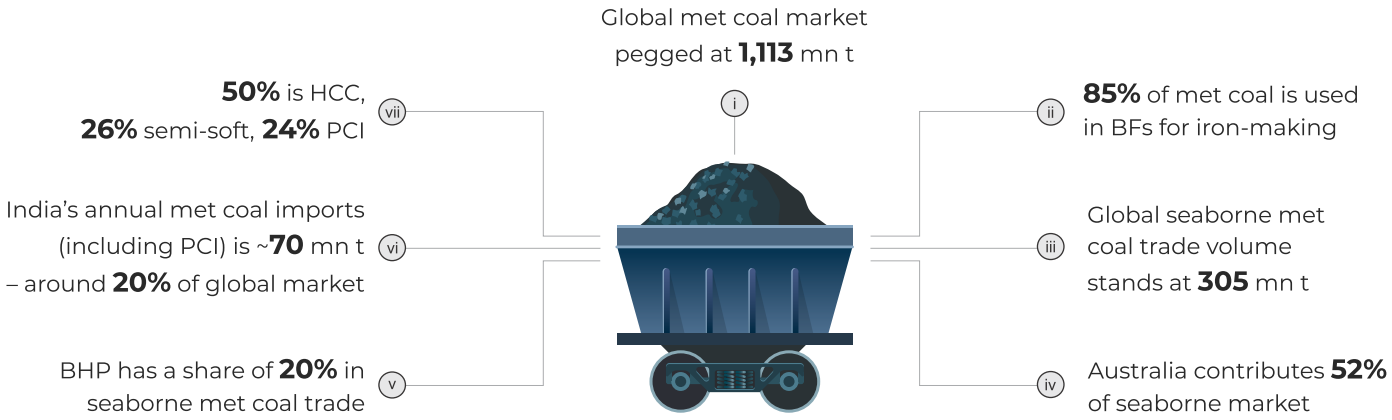
Quantity in mn t | Data in Financial year

Note- A Financial Year (FY) starts on 1st April and ends on 31st March.

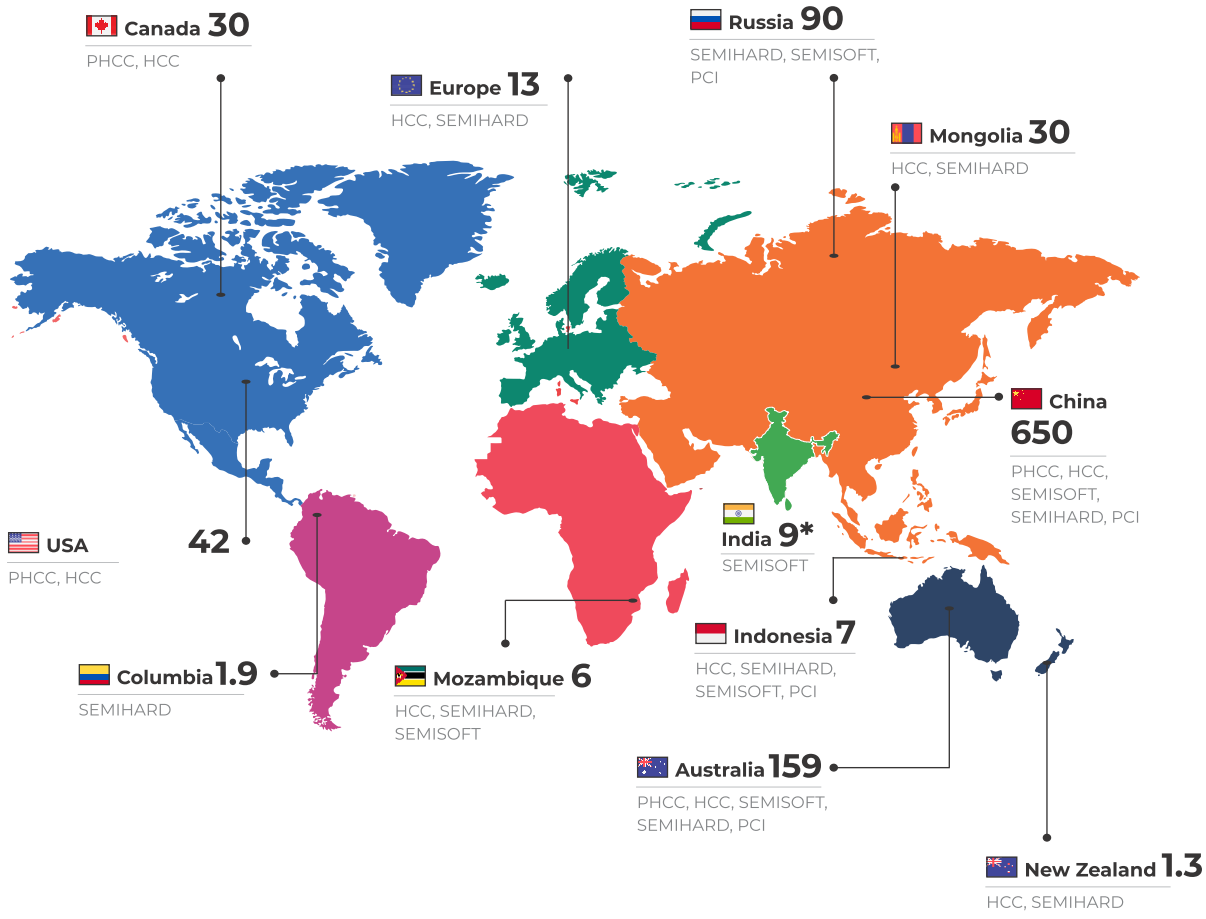
Source: SteelMint

# Synopsis of global met coal market

## 6.1 Met coal market at a glance




## 6.2 Global metallurgical coal production

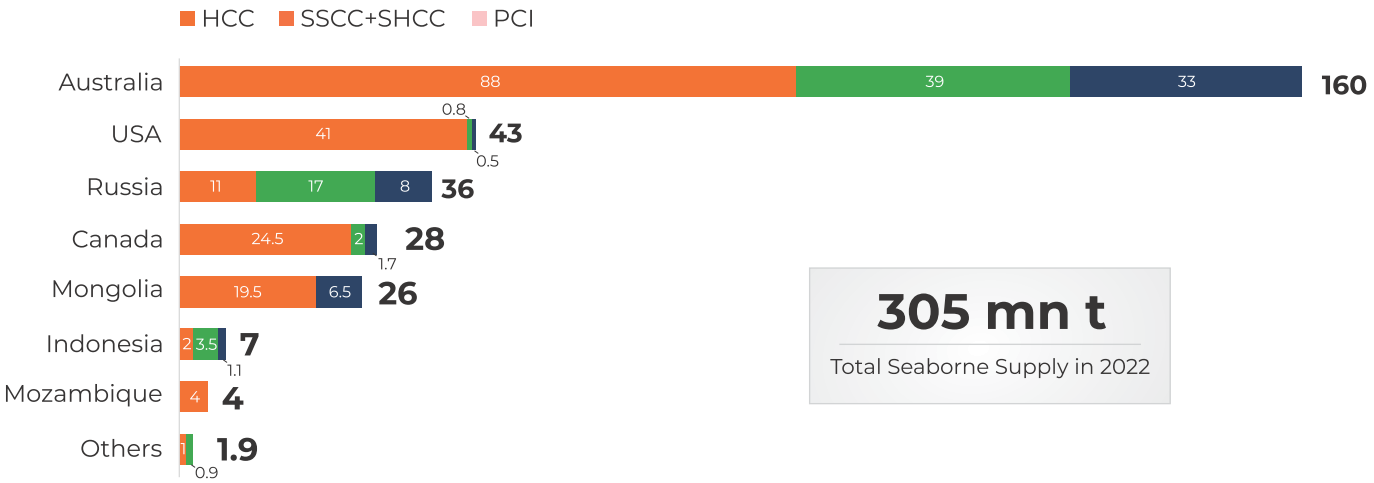



Qty in mn t | Source: CoalMint | *Raw coal feed to washeries

# Seaborne metallurgical coal supply-demand overview

## 7.1 Seaborne metallurgical coal supply

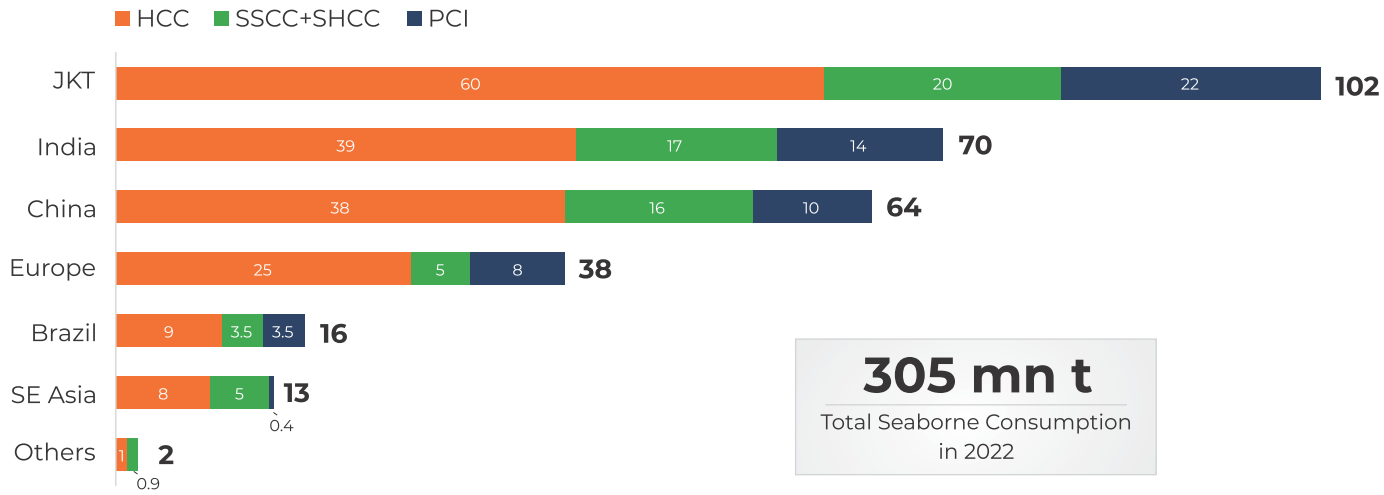
Worldwide seaborne supply of metallurgical coal stands at 305 mn t including 60% of hard coking coals (HCC), 26% of a mix of semi-soft coking coals (SCC) and SHCC, while 24% is the share of pulverised coal injection coals (PCI).




Qty in mn t | Source: CoalMint

## 7.2 Metallurgical coal consumers

Seaborne metallurgical coal trade accounts for 305 mn t comprising 69% of HCC, 16% of PCI, and 25% SSCC+SHCC grade supplies.




Qty in mn t | Source: CoalMint

JKT: Japan, South Korea & Taiwan | SE Asia: South East Asia

# Shifting dynamics of global met coal demand

China and India are major consumers of coking coal, with China using 738 mn t in 2022 and India 71 mn t. China plans to reduce coking coal usage by 20-25% by 2030 as part of its carbon neutrality efforts, thereby reducing demand to 516 mn t. In contrast, India's demand is expected to grow, reaching 116 mn t by 2030, supported by government initiatives to boost domestic steel production.

Other coking coal consumers are SE Asia, MENA, EU, CIS, JKT, and the Americas, which are expected to collectively consume 351 mn t by 2030. Global coking coal demand is projected to increase, led by India and other developing nations, while China transitions to cleaner energy sources.

## 8.1 Countrywise met coal demand

| Country | 2018 | 2019 | 2020 | 2021 | 2022 | 2025 | 2030 | Status |
|---|---|---|---|---|---|---|---|---|
| **China** | 655 | 728 | 773 | 742 | 738 | 649 | 516 | ↓ |
| **India** | 69 | 70 | 65 | 70 | 71 | 82 | 117 | ↑ |
| **SE Asia** | 11 | 15 | 18 | 22 | 20 | 30 | 42 | ↑ |
| **JKT** | 121 | 119 | 104 | 114 | 103 | 115 | 107 | ↓ |
| **EU 27** | 70 | 69 | 59 | 68 | 59 | 60 | 55 | ↓ |
| **MENA** | 18 | 17 | 16 | 17 | 16 | 19 | 20 | ↑ |
| **CIS** | 70 | 69 | 69 | 72 | 56 | 58 | 66 | ↑ |
| **Americas** | 54 | 49 | 41 | 50 | 51 | 59 | 61 | ↑ |
| **Total** | **1,067** | **1,137** | **1,144** | **1,155** | **1,114** | **1,072** | **983** | ↓ |

Quantity in mn t

JKT : Japan, Korea, Taiwan | Americas : United States, Mexico, Canada, Brazil | MENA : Turkey, Africa, Middle East Countries

CIS : Russia, Ukraine, Others | Other Asia : South East Asia, Others

Source: CoalMint

# India's metallurgical coal demand projected to grow 60% from 2022-2030

In India, the steel sector accounts for 80% of metallurgical coal demand, with the remaining 20% is used in the production of sinter, pellet, ferroalloys, and the casting/foundry industries. By 2030, the total metallurgical coal demand is projected to reach 117 million metric tonnes (mn t) of which coking coal is expected to constitute 88 mn t, while the remainder will be PCI.

## 9.1 India's metallurgical coal demand

| Steel Industry: Production (A) | Units | 2022 | 2025 | 2030 |
|---|---|---|---|---|
| **Hot Metal** | mn t | 80 | 94 | 140 |
| **Coke Rate** | t/thm | 0.41 | 0.41 | 0.38 |
| **PCI Rate** | t/thm | 0.16 | 0.16 | 0.17 |
| **Coke Demand** | mn t | 32.8 | 38.54 | 53.2 |
| **Coking Coal Demand** | Yield 75% | 44 | 51 | 71 |
| **PCI Demand** | mn t | 13 | 15 | 24 |
| **Met Coal Demand: (A)** | mn t | 57 | 66 | 95 |
| **Other Industries: Production (B)** | | | | |
| **Sinter** | mn t | 62 | 62 | 88 |
| **Pellet** | mn t | 83 | 110 | 160 |
| **Ferro Alloy** | mn t | 5 | 5.7 | 8.3 |
| **Casting/Foundry-Ferrous** | mn t | 10.5 | 11 | 12.5 |
| **Sinter: Coke Rate** | t/per ton | 0.075 | 0.075 | 0.075 |
| **Pellet: Coke Rate** | t/per ton | 0.02 | 0.02 | 0.02 |
| **Ferro Alloys: Coke Rate** | t/per ton | 0.7 | 0.7 | 0.7 |
| **Casting/Foundry: Coke Rate** | t/per ton | 0.1 | 0.1 | 0.1 |
| **Coke Demand- Other Ind** | mn t | 11 | 12 | 17 |
| **Met Coal Demand (B)** | Yield 75% | 14 | 16 | 22 |
| **Total Met Coal Demand (A+B)** | **mn t** | **71** | **82** | **117** |

Qty in mn t | Source: CoalMint | Data in calendar year

# Can India increase blend of domestic coking coal?

In 2022, India's coking coal production stood at 60 mn t but only 10-12% of this was washed and converted into coke, yielding about 4-5 mn t for use in steelmaking. Indian coal is high in ash content. So the bulk of the coking coal is imported, and there has been limited production of washed coal in the country. Importantly, 80-85% of India's coking coal demand is currently met through imports.

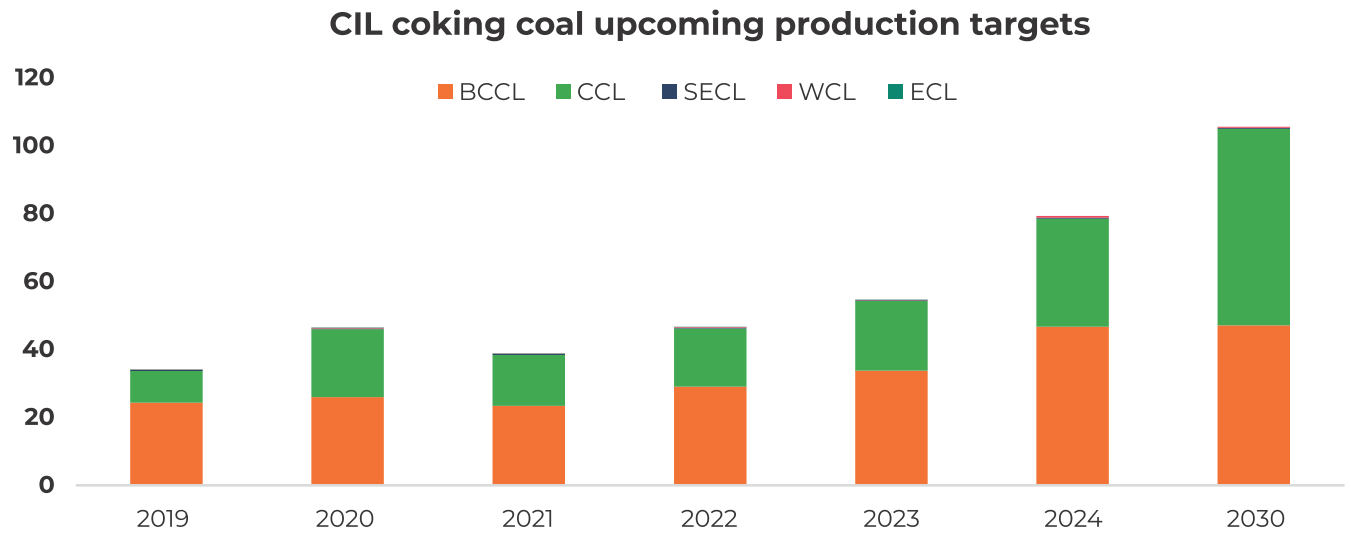
To reduce this dependency, the government has come up with **'Mission Coking Coal'** which envisages efforts to explore and mine domestic coking coal, set up coal washeries and allocate mines through auctions with the objective of achieving 140 mn t of raw coking coal production by 2030. These efforts are aligned with the 'Atma Nirbhar Bharat' initiative aimed at inculcating self-sufficiency. Currently, India uses domestic resources to meet only 10-12% of its coking coal requirement, but the government's plan aims to increase this supply by 30% through exploration, production, enhanced washing capacity, and coal mine auctions by 2030.

## 10.1 Landscape of domestic coking coal

| Domestic Supply: Best Scenario | Units | 2022 | 2025 | 2030 |
|---|---|---|---|---|
| **Coking Coal Demand (Excluding PCI)** | mn t | 58 | 67 | 93 |
| **Coking Coal Production** | mn t | 51.7 | 90 | 140 |
| **Washery Feed %** | In % | 20% | 25% | 40% |
| **Washery Input (a)** | mn t | 10.34 | 22.5 | 56 |
| **Washery Yield % (b)** | In % | 46% | 48% | 50% |
| **Domestic Supply (a*b)** | mn t | 4.8 | 10.8 | 28.0 |
| **Imported (Excluding PCI)** | mn t | 53.5 | 56.5 | 65.4 |
| **Domestic Supply: Best Scenario** | In % | 8% | 16% | 30% |
| **Domestic Supply: Base Scenario** | | | | |
| **Coking Coal Demand (Excluding PCI)** | mn t | 58 | 67 | 93 |
| **Coking Coal Production** | mn t | 52 | 65 | 100 |
| **Washery Feed %** | In % | 20% | 25% | 30% |
| **Washery Input (a)** | mn t | 10 | 16 | 30 |
| **Washery Yield % (b)** | In % | 46% | 46% | 48% |
| **Domestic Supply (a*b)** | mn t | 4.8 | 7.5 | 14.4 |
| **Imported (Excluding PCI)** | mn t | 53.5 | 59.8 | 79.0 |
| **Domestic Supply: Base Scenario** | In % | 8% | 11% | 15% |

Qty in mn t | Source: CoalMint | Data in calendar year

## 10.2 Increasing coking coal production from existing mines




Qty in mn t | Source: CoalMint | Data in financial year

Note- A Financial Year (FY) starts on 1st April and ends on 31st March

## 10.3 Coking coal washeries in India

Currently, most of the domestic raw coking coal goes to thermal power plants because it's not suitable for making steel. The government aims to increase coal washing capacity to provide more coking coal to the steel industry, reducing the need for imports. This would also create a by-product (high GCV middling) that can be used in the power sector. In India, CIL owns 90% of domestic coking coal washeries, about 27.58 million tons, while SAIL, Tata Steel, and others control the remaining 10%. However, steel production uses only a limited amount of coking coal due to quality concerns.

### Existing coal washeries

| Company | State | Capacity |
|---|---|---|
| **BCCL** | Jharkhand | 18.23 |
| **CCL** | Jharkhand | 9.35 |
| **TATA Steel** | Jharkhand | 10.5 |
| **WCL** | Madhya Pradesh | 1.2 |
| **SAIL** | Jharkhand | 2.04 |

### Upcoming coal washeries

| Company | State | Capacity |
|---|---|---|
| **BCCL** | Jharkhand | 7 |
| **CCL** | Jharkhand | 18 |
| **SAIL** | Jharkhand | 4 |
| **TATA Steel** | Jharkhand | 1.15 |
| **JSPL** | Odisha | 2 |

Qty in mn t | Source: Ministry of Coal, CIL, CoalMint

# Recent and upcoming auctioned commercial coking coal mines

## 11.1 Coking coal blocks sold under commercial mining auctions

| Name of Block | State | Geological Reserve (mn t) | Grade | Exploration Status | PRC | Winner |
|---|---|---|---|---|---|---|
| **Namchik Namphuk** | Arunachal Pradesh | 15 | Coking | E | 0.2 | Coal Pulz |
| **Brahmadiha** | Jharkhand | 5 | Coking | E | 0.2 | APMDC |
| **Jogeshwar & Khas Jogeshwar** | Jharkhand | 84 | Coking | PE | 0.6 | South West Pinnacle |
| **Lalgarh (North)** | Jharkhand | 27 | Coking | E | 1 | Adhunik Power & Natural Resources |
| **Rabodih OCP** | Jharkhand | 133 | Mixed | E | 3 | Twenty First Century Mining |
| **Choritand Tiliaya** | Jharkhand | 97 | Coking | E | 0.8 | Rungta Metals Pvt. Ltd. |
| **Sitanala** | Jharkhand | 109 | Coking | E | 0.3 | JSW Steel Ltd. |
| **Parbatpur Central** | Jharkhand | 235 | Coking | E | 0.7 | JSW Steel Ltd. |
| **Urtan** | Madhya Pradesh | 55 | Mixed | E | 0.7 | JMS Mining |
| **Urtan North** | Madhya Pradesh | 70 | Mixed | E | 0.6 | JMS Mining |
| **Beheraband North Extn** | Madhya Pradesh | 170 | Mixed | PE | 2 | Auro Coal |
| **Total** | | **1,000** | | | **10** | |

Qty in mn t | Source: Ministry of Coal, CIL, CoalMint

**E-** Explored | **PE-** Partially Explored

## 11.2 Future coking coal blocks allocation

| Block | State | Reserve | Status of Exploration | Grade | Estimated PRC |
|---|---|---|---|---|---|
| **Aluara** | Jharkhand | 720 | RE | Coking | - |
| **Babupara** | Jharkhand | 115 | RE | Coking | 2 |
| **Badam Dipside** | Jharkhand | 1,040 | UE | Coking | 1 |
| **Dipside of Rohne Rautpara** | Jharkhand | 470 | RE | Coking | 1 |
| **Duni** | Jharkhand | 140 | RE | Coking | - |
| **Gourigram** | Jharkhand | 229 | RE | Coking | - |
| **Jhirki & Jhirki West** | Jharkhand | 301 | E | Coking | 2 |
| **Lalgarh South South of Lalgarh South (2 blocks)** | Jharkhand | 300 | RE | Coking | - |
| **Muditoli** | Jharkhand | 40 | RE | Coking | 0.3 |
| **North Kathara Phase-I** | Jharkhand | 43 | E | Coking | 0.3 |
| **North Kathara Phase- II & III** | Jharkhand | 296 | E | Coking | 0.3 |
| **Parbatpur North** | Jharkhand | 425 | RE | Coking | 0.5 |
| **Phusro** | Jharkhand | 350 | RE | Coking | - |
| **Saria East** | Jharkhand | 260 | RE | Coking | 0.3 |
| **Saria West** | Jharkhand | 180 | RE | Coking | 0.3 |
| **Tambia** | Madhya Pradesh | 103 | RE | Mixed | 0.5 |
| **Tenughat North** | Jharkhand | 360 | RE | Coking | 0.3 |
| **Tenughat West** | Jharkhand | 1,000 | RE | Coking | 0.3 |
| **Gomia** | Jharkhand | 251 | E | Coking | 0.5 |
| **Kulti** | Jharkhand | 211 | E | Coking | - |
| **Mahal** | Jharkhand | 258 | E | Coking | 0.3 |

*contd.*

| Block | State | Reserve | Status of Exploration | Grade | Estimated PRC |
|---|---|---|---|---|---|
| **Pindra-Debipur-Khaowatand** | Jharkhand | 110 | RE | Coking | 0.5 |
| **Saria Koiyatand** | Jharkhand | 202 | RE | Coking | 0.5 |
| **Sitarampur** | Jharkhand | 133 | E | Coking | - |
| **Tandsi-III & Tandsi -III (Extn.)** | Madhya Pradesh | 17 | E | Coking | 0.3 |
| **Tenughat-Jhirki** | Jharkhand | 216 | E | Coking | 0.5 |
| **Chopna Shaktigarh** | Madhya Pradesh | 440 | PE | Mixed | - |
| **Total** | | **8,211** | | | **11** |

Qty in mn t | Source: Ministry of Coal, CIL, CoalMint

**E-** Explored | **PE-** Partially Explored | **RE-** Regionally Explored | **UE-** Under Exploration

## India's reliance on imports will persist

India's import dependency is expected to persist. The government aims to reduce costly imports by increasing the use of domestic coal in the production mix, but this will depend on the quantity and quality of washed coal produced.

In the base case scenario, with gradual growth in domestic coking coal production and minimal progress in coal washing, domestic sourcing is expected to increase to a maximum of 15%, necessitating imports of around 80 mn t by 2030.

Under the best-case scenario, assuming government production targets are met and planned washeries become operational, coal washing feed is projected to reach 40% by 2030. This, combined with an improved yield of 50%, would lead to domestic coal supplies meeting 30% of total demand, reducing import dependency to some extent.

In both scenarios, India's reliance on imports will persist. Therefore, steel mills should consider substantial investments in overseas mines to enhance fuel security and mitigate price volatility.

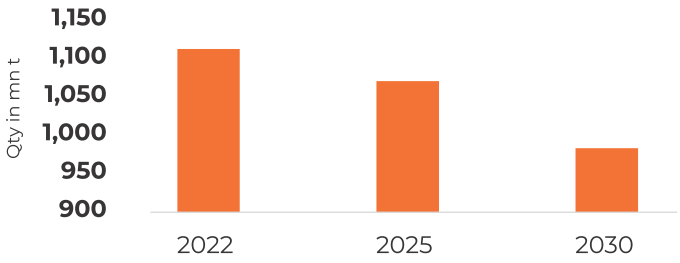
# Outlook

## Met coal demand may gradually decrease, but seaborne trade will increase

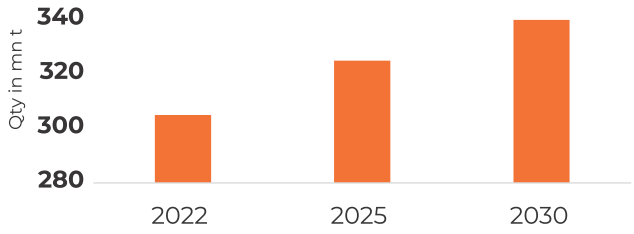
The structural decline in China's steel production is expected to result in a 50 mn t drop in met coal demand by 2030, followed by Japan and Europe. China has plans to increase crude steel production via the EAF route to 20% by 2030 from less than 10% at present. Japan and South Korea are already making efforts to transition to EAFs. In the EU, hydrogen blending in DRI production, green hydrogen-based DRI, and the transition to EAFs, for example in Tata Steel's Port Talbot works, is already evident. India is poised to fill the gap left by China, becoming a pivotal player in the premium seaborne met coal trade segment.

Efforts to increase energy and material efficiencies in steelmaking will gradually reduce met coal demand, and scrap availability will remain a primary concern. Technology costs, particularly for green hydrogen-based steel production, remain a major hindrance in the replacement of coke.

**12.1 Global Met Coal demand**




**12.2 Met Coal Seaborne trade**




Qty in mn t | Source: CoalMint | Data in Calendar year

The widespread adoption of hydrogen-based technologies in Asian economies still remains a distant prospect, with limited growth in green hydrogen supply. Replacing existing BF facilities is a complex and slow process. Forecasted hydrogen adoption in steelmaking is expected to accelerate after 2035 but hinges on technology cost shifts.

Emerging green technologies like hydrogen reduction are predicted to become competitive compared to traditional methods between 2030 and 2040 in Europe. However, future supply constraints may emerge as countries committed to carbon neutrality, such as Australia, limit new mine clearances gradually reducing met coal supply amid increased decarbonisation push.

Along with the increase in crude steel production, imports of seaborne coking coal will also edge higher. Compared to the rise in HCC volumes, however, the growth of weaker coking coal grades may be marginal.

## Hydrogen use to become widespread only after 2030

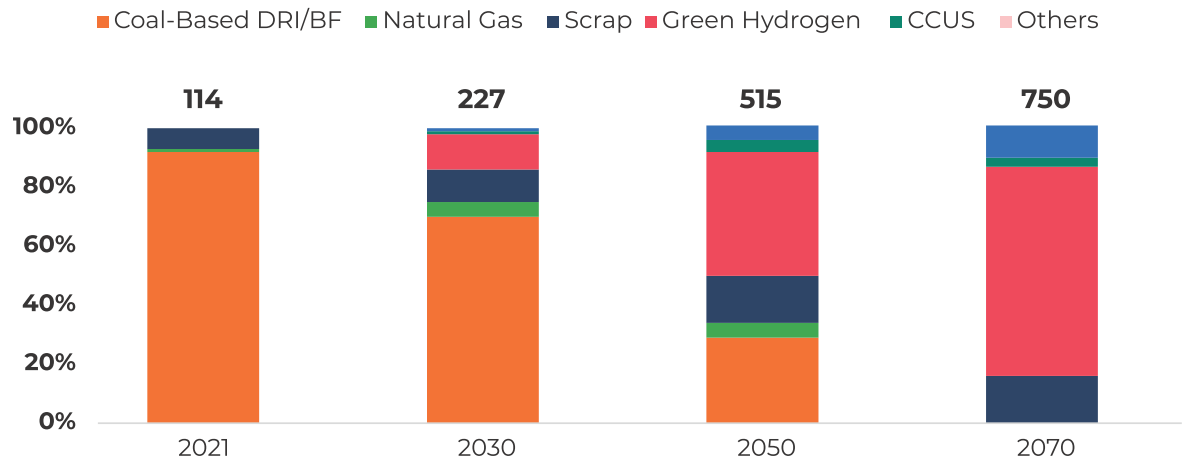
The steel industry can significantly decarbonise by switching from coal to hydrogen produced from renewable energy. Although the concept of replacing coal with hydrogen is well-established, ongoing pilot projects will refine the processes further.

Currently, replacing coal with hydrogen would increase the price of a tonne of steel by about one-third. However, this cost gap is expected to narrow and potentially disappear by 2030, driven by carbon pricing, decreasing renewable electricity costs, efficiency gains from large-scale hydrogen production, and optimising hydrogen-based steelmaking processes.

Achieving full decarbonisation of the steel industry will require a substantial increase in electricity production, approximately 20%. This necessitates a significant expansion of renewable energy production beyond simply replacing current fossil electricity generation.

While hydrogen's current supply is limited and expensive, and it may initially increase electricity costs, the transition away from metallurgical coal in favour of hydrogen is expected to occur after 2032.

### 12.3 Percentage share of different technologies in steel production by 2070




Qty in mn t | Source: IEEFA | Data in Calendar year

## PCI demand will soar in near term

PCI injection rate in BFs will grow in sync with the construction of new BFs, especially in India and SE Asia a bid to cut the fuel rate per tonne of hot metal and also due to rampant volatility in prime coking coal prices. Currently, the average PCI injection rate in India is around 130-140 kg per tonne of hot metal, which may increase to around 160 kg per tonne of hot metal on average.

## PCI supplies may eventually dry up as Australian, Russian miners cut production

With the decarbonisation wave sweeping the global manufacturing sector, growing ESG concerns and paucity of funds for new coal mining projects, it is expected that met coal mining projects will be affected eventually. As lower CO2 emissions from steel production require usage of high-grade iron ore and met coal, supplies of weaker met coal grades as well as PCI are expected to be impacted sooner than premium hard coking coal.

Australia is the leading global supplier of metallurgical coal, including PCI, with 170 mn t traded in 2022. The United States and Russia are other leading met coal suppliers.

Australia's key coal export markets such as India, Japan, South Korea, and China, have committed to long-term emission-reduction targets. These countries collectively receive a substantial portion of Australia's coal exports. The impact of country-specific decarbonisation targets on Australia's coal production until 2030 remains uncertain.

Many met coal-exporting nations, including Australia, are setting carbon-neutrality targets. Upcoming policies are expected to restrict the opening of new coking coal mines in major supply regions, potentially affecting coking coal supply by 2030.

In Australia, the government faces pressure to combat climate change by blocking new coal and gas extraction projects, potentially reducing the supply of coking coal, including PCI. If new mines are restricted, supply constraints may arise, leading to a long-term decrease in PCI supply as major mines in Australia and Russia approach the end of their lives.

On the other hand, economic sanctions on Russia may continue and even intensify in the absence of an amicable solution to the Russia-Ukraine conflict. This, expectedly, will exert great pressure on Russian capital goods imports from the West needed to ramp up coal mining and evacuation logistics. This may directly impact Russian coal exports in the mid- to long term. Russia is a major PCI coal exporter to India and other Asian countries.

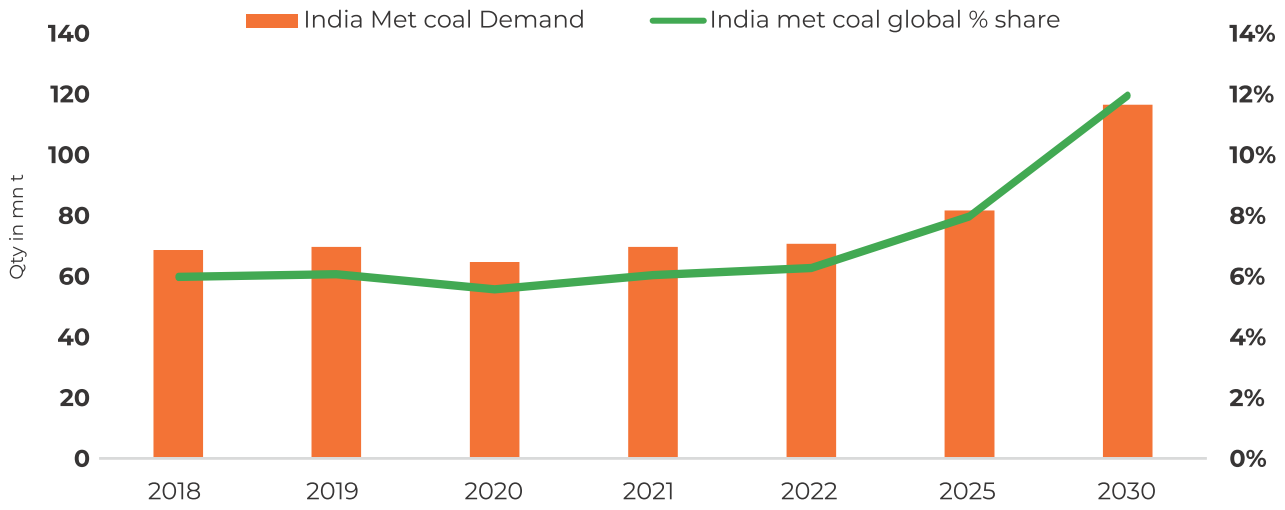
## India to emerge as largest seaborne met coal importer with over 30% market share

As steelmaking in China experiences a structural decline, met coal demand by 2030 may drop 50 mn t, with Japan and Europe following suit. India is poised to fill this gap and emerge as a major player in premium seaborne met coal trade because the country is concentrating on expanding steel production through the BOF route.

The adoption of hydrogen-based technologies in India is still at an early stage constrained by limited green hydrogen supply. Replacing existing BF facilities is a slow and complex process, and the expected surge in hydrogen adoption in India is projected after 2035, subject to shifts in technology costs.

With the high ash content of its domestic coal, India's reliance on imports is absolute. While China, Japan, Europe, and the US are transitioning toward scrap utilisation and eventually hydrogen for steel production, India's focus on boosting steel production through the BOF route will drive its met coal demand in the coming decades. Consequently, India is likely to become the largest seaborne met coal importer, with an expected market share of 30-35% by 2030.

### 12.4 Comparing India's share of metallurgical coal on the global stage




Qty in mn t | Source: CoalMint | Data in Calendar year

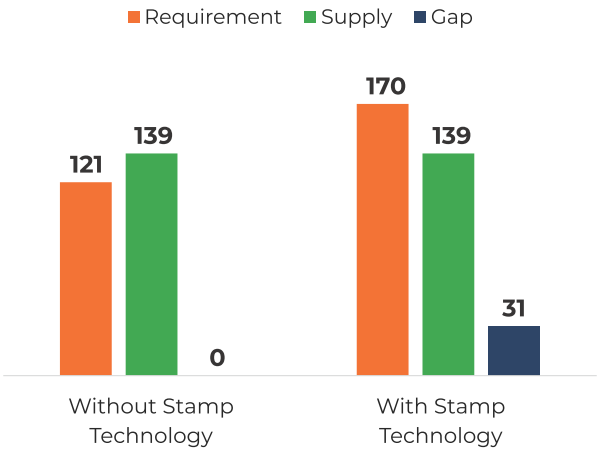
## India mills may install stamp charging to increase domestic coking coal consumption

The Ministry of Coal has projected that for producing 181 mn t of steel through the BF route by FY30, as per National Steel Policy 2017, about 161 mn t of coking coal (10-11 % ash) would be required. The demand for domestic coking coal would depend on whether stamp charging technology is being used before feeding coal into coke oven or not. Two distinct scenarios have been presented by the Ministry. Assuming stamp charging technology is not in place, demand for raw coking coal and washed coking coal (assuming 33% yield) has been estimated by the government at 121 mn t and 40 mn t respectively.

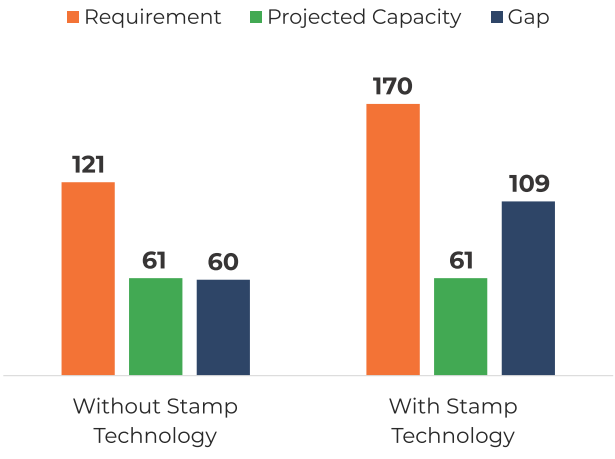
Now, assuming stamp charging technology is widely adapted, demand for raw coking coal and washed coking coal (assuming 33% yield) has been estimated at 170 mn t and 56 mn t respectively. Therefore, coking coal washery capacity would be required to wash approxim ately 121 mn t and 170 mn t of raw coking coal under both the scenarios.

So, there is reason to believe that adaption of stamp charging technology for coke-making will gain momentum in the years to come in a bid to enhance usage of domestic met coal

**12.5 Demand supply gap of domestic raw coking coal**




**12.6 Demand supply gap of coking coal washing capacity**




Qty in mn t | Source: Ministry of Coal, CoalMint

# Abbreviations

| | |
|---|---|
| **kg** | Kilograms |
| **mn t** | Million tonnes |
| **mtpa** | Million tonnes per annum |
| **CAGR** | Compound annual growth rate |
| **PMAY** | Pradhan Mantri Awas Yojana |
| **PLI** | Production linked incentive |
| **JKT** | Japan, South Korea, Taiwan |
| **Americas** | North America, South America |
| **EU 27** | Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden. |
| **MENA** | Turkey, Africa, Middle East countries |
| **CIS** | Russia, Ukraine, Others |
| **Other Asia** | South East Asia, Other asian countries |
| **BOF** | Blast oxygen furnace |
| **EAF** | Electric arc furnace |
| **IF** | Induction furnace |
| **DRI** | Direct reduced iron |
| **PCI** | Pulverised coal injection |
| **HCC** | Hard coking coal |
| **PHCC** | Premium hard coking coal |
| **SSCC** | Semi soft coking coal |
| **SHCC** | Semi hard coking coal |
| **BHP** | Broken Hill Proprietary Company, Australia |
| **SAIL** | Steel Authority of India Ltd |
| **JSPL** | Jindal Steel & Power Ltd |
| **BCCL** | Bharat Coking Coal Ltd |
| **CIL** | Coal India Ltd |
| **CCL** | Central Coalfields Ltd |
| **WCL** | Western Coalfields Ltd |
| **SECL** | South Eastern Coalfields Ltd |
| **ECL** | Eastern Coalfields Ltd |
| **PRC** | Peek rated capacity |
| **CCUS** | Carbon capture and use, storage |
| **WSA** | World Steel Association |
| **IEA** | International Energy Agency |

# Notes 

# Data Insights Decisions

## Disclaimer

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